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Teaching case: Towards bridging disciplinary divides in IT education

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MITIGATING RESPONSE DISTORTION IN IS ETHICS RESEARCH

Abstract

Response distortion attributable to a variety of human motivations has long been a recognized problem for behavioral research relying on self reports by individuals. Researchers studying unethical IS behaviors usually need to solicit self reports because of the secrecy of such behaviors. Unfortunately, the unethical nature of those behaviors often subject self reports to various response distortions such as socially desirable responding. This paper discusses the method of psychometric adjustment for response distortion and empirically examines response distortion due to socially desirable responding in a software piracy research. The boundary conditions of psychometric adjustment are then discussed in depth and the use of randomized response technique, an alternative to mitigate response distortion, in IS ethics research is highlighted.

Keywords: response distortion, socially desirable responding, software piracy.

1 INTRODUCTION

With the rapid development and proliferation of information and communication technology, we are witnessing a growing impact of information system (IS) on our daily lives and social behaviors. More and more concerns pertaining to the ethical uses of IS have come to light. Two decades ago, Mason (1986) identified privacy, accuracy, ownership and accessibility of information as four ethical issues of the information age. These issues are more relevant today than twenty years ago and touch on a wide spectrum of behaviors regarding the ethical (or unethical) uses of IS. With the widespread use of the Internet, many issues such as inappropriate use of IS (e.g., “cyberslacking¹”) and illicit behaviors enabled by the Internet (e.g., on-line gambling or pornography) are emerging.

Conceivably, individuals who engage in unethical IS behaviors may seek to conceal their behaviors as much as possible because such behaviors may be embarrassing or even subject to legal sanctions in certain cases. Unfortunately, behavioral researchers may sometimes have to solicit self reports of such behaviors from individuals in order to investigate these behaviors in greater depths. Ironically, the trustworthiness of such self reports can often be challenged and this has impeded the scientific investigation of many unethical IS behaviors.

In fact, the general problem of response distortion has long been recognized among behavioral researchers (Himmelfarb 1993). Namely, response distortion occurs when the answer provided by a respondent does not accurately reflect his/her genuine opinion, belief, feeling, intention or behavior. Apparently, such distortion would be more serious when a respondent finds the question embarrassing or when the response might incur legal liability (Locander et al 1976), as are the cases of many unethical IS behaviors.

The existence of response distortion poses serious threats to behavioral research on at least two dimensions. First, researchers are forced to study less relevant proxy variables because the variables of primary interest may be extremely sensitive and are especially inclined to elicit response distortion. Such difficulty has resulted in a general lack of research in areas where objective investigations are most needed. Second, response distortion threatens the conclusion validity of the findings. Substantive conclusions could be biased if response distortion is not taken into consideration.

For example, consider behavioral research on software piracy. Software piracy is an unethical IS behavior estimated to cost the industry over \$31 billion a year (BSA 2005). Over the past 20 years, it has attracted a continuous interest among the community of IS researchers. Due to the secret nature of the piracy behavior, many researchers studies the topic using self-reported data solicited from individuals. It is not uncommon for researchers to acknowledge response distortion as a limitation of their empirical findings (e.g. Christensen and Eining 1991; Taylor and Shim 1993; Sims et al. 1996; Cheng et al. 1997; Seale 2002; Limayem et al. 2004; Moores and Chang 2006). However, little effort has been expended to resolve this problem.

The current study uses an empirical study on software piracy to explore the existence of response distortion in IS research on unethical behavior. We outline a methodological approach based on psychometric adjustment in order to cope with response distortion. We will examine the extent to which research conclusions may be misguided if response distortion is not properly accounted for. Furthermore, the boundary conditions of psychometric adjustment will also be discussed in the hope that such approach can be adequately applied in future IS research on ethical or sensitive issues.

¹ Cyberslacking refers to the practice of employees using the Internet for leisure during work hours.

2 RESPONSE DISTORTION DUE TO SOCIALLY DESIRABLE RESPONDING

The motivations behind response distortion are multifaceted. According to Himmelfarb (1993), people hide their true responses “to protect their privacy, to avoid legal prosecution, to gain economic advantage, to obtain social approval and avoid social disapproval, and to project or protect particular identities” (p. 72).

Among the many forms of response distortion, socially desirable responding has received much attention in research on response distortion in self-reported data (Kline et al 2000). Socially desirable responding is defined as “responding to items more as a result of their social acceptability than their true feelings” (Podsakoff et al. 2003 p. 882). Ganster et al. (1983) considered socially desirable responding as “a tendency for an individual to present him or herself, in test-taking situations, in a way that makes the person look positive with regard to culturally derived norms and standards” (p. 322).

More specifically, respondents are likely to underreport socially unacceptable opinions, attitudes, and behaviors while they over-report socially acceptable ones. Socially desirable responding is mainly driven by the need for social approval (Crowne and Marlowe 1964), which belongs to one of the motivations of response distortion as discussed by Himmelfarb (1993). In the context of IS ethics research, socially desirable responding may lead the respondent to over-report ethical IS behaviors (e.g. observing the acceptable IS use policy of the company) while underreport unethical IS behaviors (e.g. breaking privacy regulation of the company). As such, it is reasonable to expect that socially desirable responding is an important sources of response distortion in IS ethics research.

2.1 Psychometric Measurement of Socially Desirable Responding

Personality psychology researchers have been studying socially desirable responding since the seminal work of Hartshorne and May (1928)². Based on the Minnesota Multiphasic Personality Inventory (MMPI), Edwards (1957) provided strong empirical evidence that respondents had a high tendency to admit self-descriptions they regarded as desirable, suggesting that the MMPI score was likely to be contaminated by socially desirable responses. Crowne and Marlowe (1964) further proposed that socially desirable responding is driven by “the need for social approval and acceptance and the belief that it can be attained by means of culturally acceptable and appropriate behaviors”. (p. 109) The authors managed to assemble a collection of 33 behaviors that are either “desirable but uncommon” or “undesirable but common”. These behaviors constitute the M-C SD Scale, a psychometric instrument aiming at measuring a respondent’s propensity for socially desirable responding.

Paulhus (1984) argued that there are in fact two dimensions of socially desirable responding: self-deception and impression management (also known as other-deception). The former refers to the unconscious tendency for one to see oneself favorably while the latter refers to a conscious presentation of a false image, for the purpose of pleasing others. Paulhus (1984, 1991) developed another 40-item psychometric measurement scale for socially desirable responding, called the Balanced Inventory of Desirable Responding (BIDR), which clearly separates the self-deception dimension from the impression management dimension.

The sixth version of the BIDR scale (aka BIDR-6) published by Paulhus in 1991 is shown in the Appendix. BIDR-6 consists of a total of 40 items, with 20 of them measuring the self-deception dimension and the remaining 20 measuring the impression management dimension. All the items are on the possession of a variety of “unlikely virtues” such as “never cover up mistakes” or “always

² The development of the “lie scale” by Hartshorne and May (1928) can be regarded as one of the early attempts to assess socially desirable responding among school children.

appreciate criticism”. The summated score of these items indicates the extent a respondent claims to possess these virtues. Since these virtues are desirable but unlikely, the score indicates the propensity of a respondent to engage in socially desirable responding. The summated score of BIDR-6 was found to correlate highly with the more traditional M-C SD Scale and had very stable test-retest reliability (Paulhus 1991).

2.2 Psychometric Adjustment for Socially Desirable Responding

The psychometric perspective on socially desirable responding posits that respondents differ in their propensities for socially desirable responding and these idiosyncratic propensities can be measured psychometrically. Measurement of idiosyncratic socially desirable responding is usually administered together with measurement of substantive variables of interest. This serves two main purposes. First, researchers can detect if socially desirable responding does exist in self-reported data by checking if there is a significant correlation between the socially desirable responding score and the variable of interest (e.g., Paulhus 1991). Second, if socially desirable responding is indeed detected, researchers may correct or adjust for it using various statistical techniques (Fisher and Katz 2000; Podsakoff et al. 2003).

A commonly known approach of psychometric adjustment applies to the correlation between two variables that are believed to be contaminated by socially desirable responding. The simplest form of adjustment can be accomplished by using the partial correlation controlling for socially desirable responding in place of the zero-order correlation between the substantive variables. A more sophisticated adjustment can be performed by adopting a measurement model that is confounded with measures of socially desirable responding. Podsakoff et al. (2003) provided an excellent summary on such methods.

Apart from adjustment on the correlation between two variables, it is also possible to adjust for socially desirable responding in individual variables. This can be accomplished by regressing the substantive variable of interest on the measurement of socially desirable responding. The resulting intercept term represents the mean estimate of the substantive variable with effect of socially desirable responding removed (Fisher and Katz 2000).

In the following, we will examine psychometric adjustment in an empirical study on software piracy.

3 PSYCHOMETRIC ADJUSTMENT FOR SOCIALLY DESIRABLE RESPONDING IN SOFTWARE PIRACY RESEARCH

To illustrate socially desirable responding, we make reference to the work by Cheng et al. (1997). The authors attempted to identify factors that motivate people to use pirated software through a survey of 340 university students. Students were asked to score their perceived importance of nine commonly considered motivations of software piracy. Their results are shown in Table 1 (ratings range from 1 to 9 with a smaller value indicating higher importance).

Cheng et al. (1997) were careful to employ the indirect questioning method (Robertson and Joselyn 1974; Anderson 1978) in their study. Specifically, respondents were asked to rank the reasons that motivate “people”, not necessarily themselves, to use pirated software. Fisher (1993) provided empirical evidence that indirect questioning helps to reduce socially desirable responding. Also, Simon and Simon (1975) reported that responses solicited from indirect questioning are not totally objective. To a large extent, the responses include the respondent’s own thinking.

Reason to Pirate Software	Rating of Importance
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	Sample Mean	Standard Deviation	T-Statistics for Difference from the Previous Reason
Reason1: Software too expensive	1.899	1.317	Not Applicable
Reason2: Want to try out the software	3.213	2.122	-7.391 (p=0.0001)
Reason3: Can't afford the software	3.286	2.259	-0.437 (p=0.662)
Reason4: Only use it for a short time	3.310	2.239	-0.307 (p=0.759)
Reason5: It's easy to copy software	3.702	2.205	-1.634 (p=0.104)
Reason6: New version is coming up	4.482	2.492	-2.755 (p=0.007)
Reason7: Little chance of being caught	4.908	2.591	-1.627 (p=0.106)
Reason8: Most people I know copy software	5.543	2.532	-3.357 (p=0.001)
Reason9: Software license too restrictive	6.178	2.490	-1.953 (p=0.053)
Note: Importance scores range from 1 to 9 with a smaller value indicating higher importance			

Table 1. Ranking of Reasons for Piracy (Cheng et al 1997)

As shown in Table 1, some of the listed reasons appear to be more socially desirable than do others. Thus, it is plausible that socially desirable responding was not completely eliminated. For example, the reasons “software too expensive” and “can’t afford the software” appear to be more socially acceptable than “little chance of being caught.” Therefore, the tendency for the respondents to overrate the first two reasons and underrate the third reason cannot be ruled out. In fact, the relatively low importance of “little chance of being caught” is surprising and contradicts the findings from other research (e.g., Peace et al. 2003). It is possible that respondents with high propensities for socially desirable responding might have underreported the importance of the chance of being caught.

3.1 Methods

To probe further into the existence of response distortion, we conducted a survey similar to that of Cheng et al (1997). A total of 612 university students (289 male and 323 female) from a major university in Hong Kong were recruited to participate in the study. Respondents were unaware of the topic of study at the time of recruitment so that bias due to sample selection was minimized. All respondents were requested to answer a set of questions anonymously.

Respondents were first asked to complete the 40-item BIDR-6 (see Appendix). The BIDR items were measured using a 7-point scale ranging from “Strongly Disagree” (1) to “Strongly Agree” (7). The summated score of the 40 BIDR items was used to indicate an individual’s propensity of socially desirable responding as it was found to correlate highly with the more traditional M-C SD Scale and had very stable test-retest reliability (Paulhus 1991).

Then, they were asked to rate the importance of the nine reasons for people to pirate software, as listed in Table 1. The reasons for pirating were rated with a range from 1 to 9 with a smaller value indicating higher importance.

3.2 Detection of Socially Desirable Responding

We detected traces of socially desirable responding in the correlation between respondent’s socially desirable responding (SDR) score and the corresponding ratings of piracy reasons as shown in Table 2.

	Rating of Piracy Reasons								
	Reason 1	Reason 2	Reason 3	Reason 4	Reason 5	Reason 6	Reason 7	Reason 8	Reason 9
Correlation with SDR	-0.064 (p=0.113)	-0.051 (p=0.208)	-0.076 (p=0.060)	-0.016 (p=0.690)	-0.035 (p=0.389)	-0.037 (p=0.357)	0.130 (p<0.01)	0.127 (p<0.01)	-0.054 (p=0.185)

Table 2. Correlation of Socially Desirable Responding with Ratings of Piracy Reasons

Our results show that the socially desirable responding score does not have significant correlation with the rating of all reasons except Reason 7 (i.e., “little chance of being caught”) and Reason 8 (i.e., “most people I know copy software”). In both cases, the correlation is positive, suggesting that respondents with higher propensities for socially desirable responding indeed reported a higher rating (and thus lower importance) for these two reasons. Although the correlations (0.13 and 0.127) for Reasons 7 and 8 are only moderate, they are significant ($p < 0.01$) and may have an impact on the relative ranking of the listed reasons.

3.3 Adjustment of Socially Desirable Responding

To illustrate the sensitivity of the findings to socially desirable responding, the nine reasons were ranked again after adjusting for socially desirable responding based on the BIDR instrument. This is accomplished by regressing each rating score on the socially desirable responding score. The resulting intercept term represents the mean estimate of the rating with the effects of socially desirable responding removed (Fisher and Katz 2000).

An assumption behind this technique is that socially desirable responding is unrelated to the factors leading to one’s genuine judgment of a reason’s importance. Technically speaking, the simple regression of the importance score on the socially desirable responding score is subject to the problem of omitted independent variables (see Cohen et al. 2003 pp. 127). However, as we assume that socially desirable responding is orthogonal to the underlying factors affecting a person’s evaluation of the importance of a pirating reason, the estimate of intercept term is still unbiased (Greene 2003) by the assumption of orthogonality³.

Table 3 shows the mean estimates and the 90% confidence intervals of the nine reasons before and after the psychometric adjustment. It can be seen that the ranking is quite different after adjustment for socially desirable responding. While Reason 1 (“software too expensive”) still maintains the top rank on the list, Reason 7 (“little chance of being caught”) rises to become the second most important reason for software piracy. Also, Reason 8 (“most people I know copy software”) advances to the fourth place after adjustment. The revised ordering is consistent with our expectation that respondents do not reveal their true responses.

Reason to Pirate Software	Rating (Mean [90%-CI])		
	Cheng et al (1997)’s Study	Our Study (Unadjusted)	Our Study (Adjusted)
Reason1: Software too expensive	1.90 [1.78,2.02] Rank 1	1.80 [1.67,1.92] Rank 1	2.40 [1.76,3.04] Rank 1
Reason2: Want to try out the software	3.21 [3.02,3.40] Rank 2	5.65 [5.51,5.79] Rank 6	6.20 [5.47,6.93] Rank 7
Reason3: Can’t afford the software	3.29 [3.08,3.49] Rank 3	2.94 [2.80,3.08] Rank 2	3.74 [3.03,4.44] Rank 3
Reason4: Only use it for a short time	3.31 [3.11,3.51] Rank 4	5.64 [5.50,5.77] Rank 5	5.81 [5.09,6.53] Rank 6
Reason5: It’s easy to copy software	3.70 [3.51,3.90] Rank 5	4.80 [4.67,4.92] Rank 3	4.46 [3.80,5.12] Rank 4

³ Apart from the technical perspective, we will also discuss more about this independence assumption from the theoretical perspective after our empirical findings are presented.

Reason6: New version is coming up	4.48 [4.26,4.70] Rank 6	6.45 [6.31,6.59] Rank 8	6.83 [6.13,7.54] Rank 8
Reason7: Little chance of being caught	4.91 [4.68,5.14] Rank 7	5.10 [4.95,5.25] Rank 4	3.60 [2.82,4.37] Rank 2 (up 2 ranks)
Reason8: Most people I know copy software	5.54 [5.32,5.77] Rank 8	6.00 [5.87,6.13] Rank 7	4.71 [4.02,5.40] Rank 5 (up 2 ranks)
Reason9: Software license too restrictive	6.18 [5.96,6.40] Rank 9	6.63 [6.48,6.78] Rank 9	7.25 [6.47,8.04] Rank 9

Table 3. *Ranking of Reasons for Piracy*

This study serves to demonstrate how socially desirable responding affects any substantive conclusions of software piracy studies based on self-reported data. It is observed that the slim likelihood of being caught is an important motivation to engage in software piracy behavior. However, our respondents did not directly admit to this behavior. A plausible explanation is that university students, being the more educated and elite class in the society, may feel embarrassed to admit that deterrence is an important consideration of whether to pirate.

The implementation of any anti-piracy strategy or policy is likely to incur substantial business, social and political costs. In order to formulate the most effective countermeasures against software piracy, an in-depth understanding of the importance of motivating factors behind piracy behavior is essential. For instance, the software industry has been calling for more stringent law enforcement whereas critics maintain that reduction in price may be more effective. Understanding whether people would be dissuaded from piracy by a reduction in software price or by more stringent law enforcement would provide valuable insights for reaching broad consensus among different stakeholders. Our results suggest that both price cutting and law enforcement would be effective and important countermeasures to combat piracy. Had we ignored the response distortion in our studies, we would have missed out an important motivation behind piracy and an effective countermeasure to the problem.

4 DISCUSSIONS

Our empirical study is based on a sample of university students in Hong Kong and thus the substantive findings should only be interpreted within this confine. Nevertheless, we highlight the methodological implications of ignoring response distortion in similar empirical studies. In the following, we further consider the boundary conditions of the approach used.

First, we assume that the propensity for socially desirable responding is unrelated to the underlying substantive variables of interest. It follows that the correlation between socially desirable responding and the variables of interest can be attributed to socially desirable responding alone, and thus can be safely removed. Otherwise, adjustment is unwarranted and will reduce the content validity and predictive power of the measured variable (Zerbe and Paulhus 1987). Paulhus (2002) commented on the importance of distinguishing measurements of socially desirable responding that focus on the “style” of the response (i.e., response style) from measurements that tap on the “content” of the response (i.e., relevant components of the variable in concern). Adjustment is not necessary in the latter case.

For instance, Fisher and Katz (2000) argued against adjustment for socially desirable responding on self-reported personal values because of a conceptual overlap between the “need for social approval”, the motivation of socially desirable responding, and the intrinsic values of a person. In our study, we were cautious about the existence of such a conceptual overlap when responses on personal involvement (e.g., evaluative variables such as attitude toward piracy) are solicited through direct questioning. For instance, if respondents feel that purchasing licensed software would make them

appear stupid before their peers (i.e., social disapproval), such a sentiment may also be reflected in their self-reported attitude toward software piracy. Adjustment on the self-reported attitude for socially desirable responding scores would therefore be redundant and would distort the true attitude held by the respondent.

Second, psychometric adjustment for socially desirable responding is not applicable in cases when respondents feel threatened (e.g., due to risk of prosecution) even though social sanctioning does not exist or is largely absent. Such situations are best exemplified by discrepancies between law and social norms. Nederhof (1985) pointed out that norms, instead of laws, are the most important determinants of socially desirable behaviors. His example to illustrate this point was gang members who admitted to more violations of the law than actually committed in order to impress others. In the context of software piracy, using pirated software may not be judged as undesirable in certain social groups. In this case, underreporting of piracy intention (or behavior) would not be motivated by socially desirable responding. Instead, it is triggered by the fear of legal sanctions.

In summary, response distortion in self-reports of software piracy behavior may not be entirely attributed to socially desirable responding alone and therefore psychometric adjustment may not always be effective.

4.1 Confidentiality Assurance to Respondents

In view of the limitations of psychometric adjustment, it would obviously be more desirable if motivations behind untruthful responding can be eliminated as much as possible rather than being adjusted for after the fact. Conceivably it serves as a more fundamental cure to response distortion than psychometric adjustment.

Traditionally, researchers soliciting self-reports on sensitive topics would provide confidentiality assurance to respondents so as to encourage truthful responding. Usually this is accomplished by convincing the respondents that a survey is completely anonymous or confidential. Over the years a number of good survey practices (e.g. physical separation of respondents, promises of confidentiality, emphasis on truthful responding rather than a “right” answer, etc.) has been identified for different types of survey administrations (see Paulhus 1991). Confidentiality assurance is a very powerful strategy in the sense that, if successful, should naturally eliminate most of the motivations behind response distortion (including socially desirable responding). The success of this strategy hinges on whether the assurance does look convincing to the respondent. When questions are considered threatening, credibility of such confidentiality assurance would be of prime importance as respondents may demand a more convincing assurance.

4.2 Randomized Response Technique and Research on Unethical IS Behaviors

Randomized response technique (RRT) is a questioning method that incorporates respondent confidentiality by design, and was developed to encourage truthful responding on sensitive topics. First invented by Warner (1965), various forms of RRT have been designed (Warner 1965; Greenberg et al 1969; Greenberg et al 1971; Himmelfarb and Lickteig 1982; Fox and Tracy 1986) to date for soliciting truthful responses to evasive or embarrassing questions. The core idea of RRT is to assure complete confidentiality of a participant’s response by contaminating it with a random “noise” value with known statistical properties.

For instance, in the unrelated-question randomized response model (Greenberg et al 1969), participants are instructed to choose among a set of questions to answer according to a randomizing device controlled by them privately (e.g. as simple as flipping a coin). Each sensitive question is paired with another unrelated and innocuous (i.e. non-sensitive) question such that the participants would answer either one of them depending on the outcome of the privately performed randomization procedure. As the researcher has no way to know exactly which question was answered, complete

confidentiality can be assured and this should in turn help eliminate any possible stigma or embarrassment caused by the sensitive question, resulting in more truthful responses. On the other hand, as the probabilistic property of the randomization procedure is known, useful aggregate properties of the answer to the sensitive question can be estimated using statistical methods. For instance, if coin-flipping was used as the randomization procedure, researchers would know that about half of the respondents should have actually answered the sensitive question and may derive useful research conclusions.

Originally, RRT was limited to two-choice questions only. It was later extended to cover multiple-choice questions as well as quantitative answers. As the majority of literature on RRT focuses on univariate analysis (e.g. proportion of people committing a certain criminal behavior, mean value of a certain sensitive characteristic, etc.), there is a common misunderstanding that RRT is limited to univariate analysis. This is in principle not true although more sophisticated statistical estimators would be required for multivariate analysis.

In particular, Kwan, So and Tam (forthcoming) demonstrated an innovative method to deploy RRT for correlational studies. By representing randomized responses in a mathematical model consisting of indicator variables, estimators for the mean, variance and covariance of randomized responses can be derived based on the method of moments. The method has been empirically tested using two empirical studies on software piracy using online survey data. The applicability and usefulness of RRT for studying unethical IS behaviors have been clearly demonstrated.

Comparative studies have shown that RRT leads to higher admission of sensitive characteristics. Validation studies deploying participants whose sensitive characteristics were known in advance have also revealed that RRT does outperform other techniques in soliciting valid responses to sensitive questions (Umesh & Peterson 1991; Scheers 1992; Hosseini & Armacost 1993).

However, there are a number of issues with RRT that must be noted. First, there is an additional sampling error due to the randomization procedure. This would inevitably reduce the overall measurement reliability and a larger sample size would normally be needed. As the loss of statistical power would depend on (i.e. decrease with) the probability of respondents answering the sensitive question, researchers have to trade off between a higher perceived confidentiality protection and a higher data collection efficiency (Fox & Tracy 1986). Hosseini & Armacost (1993) thus concluded that RRT should only be used for questions of sensitive nature. We believe that questions pertaining to unethical IS behaviors should belong to this category.

Second, the complexity due to randomization procedure may not be completely understood by respondents, especially those less educated ones, resulting in incorrect responses or missing data. Those respondents who do not understand the procedure well may not be convinced of the confidentiality protection that is built into the method, further undermining the benefit of RRT. In most research studies on unethical IS behaviors, it should be reasonable to assume the target population (i.e. IS users) should belong to the more educated class. We thus believe this should be an appropriate context to apply RRT.

Third, it should be noted that RRT is a procedural improvement (Podsakoff et al 2003) on increasing the credibility of response confidentiality. Even if RRT is successfully applied in a survey, there may still be untruthful responding although it is reasonable to assume the amount of distortion should be much less than that when direct self-reports are solicited. In fact, a recent RRT validation study conducted by van der Heijden et al (2000) compared the proportions of respondents admitting income fraud when surveyed using different questioning methods. The study revealed that RRT could help boost the percentage of truthful response to 43%, up from 25% with face-to-face direct questioning and 19% with computer-assisted self interview. Although it is not a complete cure to the problem of response distortion, this clearly represents a significant improvement.

5 CONCLUSION

We have empirically examined response distortion in self-reports based on an empirical study on software piracy. Despite the use of an indirect questioning technique to minimize socially desirable responding in our study, we still observed evidence of response distortion. Our findings substantiate the worries of many previous researchers about response distortion in software piracy research.

We demonstrated how substantively different conclusions about the motivating factors behind software piracy can be reached with or without psychometric adjustment for socially desirable responding. In particular, we found that the slim possibility of being caught committing piracy could be an important reason for piracy behavior although respondents would not admit this directly. Our findings demonstrate how response distortion could mislead researchers into erroneous conclusions.

We also discussed the limitations of psychometric adjustment for socially desirable responding. First, if the substantive variables of interest are actually related to socially desirable responding in theory, psychometric adjustment would be inappropriate because it would reduce the content validity of the measured constructs. Second, psychometric adjustment would be irrelevant when the anticipated distortion is not attributable to socially desirable responding. Lastly, we highlighted the use of randomized response technique for assuring confidentiality and mitigating response distortion when psychometric adjustment is inappropriate.

In conclusion, we find response distortion to be a real threat to research that relies on self-reports of unethical IS behaviors. Although our empirical study was conducted in the domain of software piracy, we believe the problem is also threatening research in ethical or unethical IS behaviors such as data privacy, cyberslacking, system hacking, online gambling and pornography viewing. Psychometric adjustment for socially desirable responding should help alleviate the problem in certain contexts but may not be useful in many others. We encourage researchers to employ RRT as a more fundamental remedy for tackling response distortion in research related to sensitive topics.

References

- Anderson, J.C. (1978) "The Validity of Haire's Shipping List Projective Technique," *Journal of Marketing Research* (15), November 1978, pp. 644-649.
- Armocost, R.L., Hosseini, J.C., Morris, S.A. and Rehbein, K.A. (1991) "An Empirical Comparison of Direct Questioning, Scenario, and Randomized Response Methods for Obtaining Sensitive Business Information," *Decision Sciences* (22:5), 1991, pp. 1073-1090.
- Business Software Alliance (2005) *Second Annual BSA and IDC Global Software Piracy Study*, May 2005.
- Cheng, H.K., Sims, R.R. and Teegen, H. (1997) "To Purchase or to Pirate Software: An Empirical Study," *Journal of Management Information Systems* (13:4), Spring 1997, pp. 49-60.
- Christensen, A.L. and Eining, V. (1991) "Factors Influencing Software Piracy: Implications for Accountants," *Journal of Information Systems*, Spring 1991, pp. 67-80.
- Cohen, J., Cohen, P. West, S.G. and Aiken, L.S. (2003) *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences (3rd Edition)*, Lawrence Erlbaum Associates, 2003.
- Crowne, D.P. and Marlowe, D. (1964) *The Approval Motive: Studies in Evaluative Dependence*, New York: Wiley, 1964.
- Edwards, A.L. (1957) *The Social Desirability Variable in Personality Assessment and Research*, New York: Dryden, 1957.
- Fisher, R.J. (1993) "Social Desirability Bias and the Validity of Indirect Questioning," *Journal of Consumer Research* (20), September 1993, pp. 303-315.
- Fisher, R.J. and Katz, J.E. (2000) "Social-Desirability Bias and the Validity of Self-Reported Values" in *Psychology & Marketing* (17:2), pp. 105-120.
- Fox, J.A. and Tracy, P.E. (1986) *Randomized Response: A Method for Sensitive Surveys*, 1986.

- Ganster, D.C., Hennessey, H.W. and Luthans, F. (1983) "Social Desirability Response Effects: Three Alternative Models," *Academy of Management Journal* (26:2), June 1983, pp. 321-331.
- Greene, W.H. (2003) "Least Square Regression" in *Econometric Analysis (Fifth Edition)*, 2003.
- Greenberg, B.G., Abul-Ela, A.A., Simmons, W.R. and Horvitz, D.G. (1969) "The Unrelated Question Randomized Response Model: Theoretical Framework," *Journal of the American Statistical Association* (64:326), June 1969, pp. 520-539.
- Greenberg, B.G., Kuebler, R.R., Abernathy, J.R. and Horvitz, D.G. (1971) "Application of the Randomized Response Technique in Obtaining Quantitative Data," *Journal of the American Statistical Association* (66:334), June 1971, pp. 243-250.
- Hartshorne, H. and May, M.A. (1928) *Studies in Deceit*, New York: Macmillan, 1928.
- Himmelfarb S. and Lickteig C. (1982) "Social Desirability and the Randomized Response Technique," *Journal of Personality and Social Psychology* (43:4), 1982, pp. 710-717.
- Himmelfarb, S. (1993) "The Measurement of Attitudes," in *Psychology of Attitudes*, by Alice H. Eagly and Shelly Chaiken, 1993, pp. 23-87.
- Hosseini, J.C. and Armacost (1993) "Gathering Sensitive Information in Organizations," *American Behavioral Scientist* (36), 1993, pp. 443-471.
- Kline, T.J.B., Sulsky, L.M. and Rever-Moriyama, S.D. (2000) "Common Method Variance and Specification Errors: A Practical Approach to Detection," *Journal of Psychology* (134:4), 2000, pp. 401-421.
- Kwan, S., So, M. and Tam, K.Y. (forthcoming) "Applying Randomized Response Technique to Elicit Truthful Responses to Sensitive Questions in IS Research: The Case of Software Piracy Behavior," in *Information Systems Research*, forthcoming
- Limayem, M., Khalifa, M. and Chin, W.W. (2004) "Factors Motivating Software Piracy: A Longitudinal Study," *IEEE Transactions on Engineering Management* (50:4), 2004, pp. 414-425.
- Locander, W., Sudman, S., and Blackburn, N. (1976) "An Investigation of Interview Method, Threat and Response Distortion" in *Journal of the American Statistical Association* (71:354), June 1976, pp. 269-275.
- Mason R.O. (1986) "Four Ethical Issues of the Information Age," *MIS Quarterly* (10:1), March 1986, pp. 5-12.
- Moore, T. and Chang, J. (2006) "Ethical Decision Making in Software Piracy: Initial Development and Test of a Four-Component Model," *MIS Quarterly* (30:1), March 2006, pp. 167-180.
- Nederhof, A.J. (1985) "Methods of Coping with Social Desirability Bias: A Review," *European Journal of Social Psychology* (15), 1985, pp. 263-280.
- Paulhus, D.L. (1984) "Two-Component Models of Socially Desirable Responding," *Journal of Personality and Social Psychology* (46:3), 1984, pp. 598-609.
- Paulhus, D.L. (1991) "Measurement and Control of Response Bias," in *Measures of personality and social psychological attitudes* by J.P. Robinson, P.R. Shaver, & L.S. Wrightsman (eds.), 1991, pp. 17-59.
- Paulhus, D.L. (2002) "Socially Desirable Responding: The Evolution of a Construct," in *The Role of Constructs in Psychological and Educational Measurement* by H.I. Braun, D.N. Jackson and D.E. Wiley (eds.), Mahwah New Jersey: Erlbaum, 2002, pp. 49-69.
- Peace, A.G., Galletta, D.F. and Thong, J.Y.L. (2003) "Software Piracy in the Workplace: A Model and Empirical Test," *Journal of Management Information Systems* (20:1), Summer 2003, pp. 153-177.
- Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y. and Podsakoff, N.P. (2003) "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies," *Journal of Applied Psychology* (88:5), 2003, pp. 879-903.
- Robertson, D.H. and Joselyn, R.W. (1974) "Projective Techniques in Research," *Journal of Advertising Research* (14), October 1974, pp. 27-31.
- Scheers, N.J. (1992) "A Review of Randomized Response Techniques," *Measurement and Evaluation in Counseling and Development* (25:1), April 1992, pp. 27-41.
- Seale, D.A. (2002) "Why Do We Do it if We Know It's Wrong? A Structural Model of Software Piracy," in *Ethical Issues of Information Systems*, 2002, pp. 120-144.

- Simon, J. and Simon, R. (1975) "The Effect of Money Incentives on Family Size: A Hypothetical-Question Study," *Public Opinion Quarterly* (38), Winter 1975, pp. 585-595.
- Sims, R.R., Cheng, H.K. and Teegen, H. (1996) "Toward a Profile of Student Software Pirates," *Journal of Business Ethics* (15:8), 1996, pp. 839-849.
- Taylor, G.S. and Shim, J.P. (1993) "A Comparative Examination of Attitudes toward Software Piracy among Business Professors and Executives," *Human Relations* (46:4), 1993, pp. 419-433.
- Umesh, U.N. and Peterson, R.A. (1991) "A Critical Evaluation of the Randomized Response Method: Applications, Validation, and Research Agenda," *Sociological Methods and Research* (20), 1991, pp. 104-138.
- Van der Heijden, P.G.M., van Gils, G., Bouts, J. and Hox, J.J. (2000) "A Comparison of Randomized Response, Computer-Assisted Self-Interview, and Face-to-Face Direct Questioning: Eliciting Sensitive Information in the Context of Welfare and Unemployment Benefit," *Sociological Methods & Research* (28:4), May 2000, pp. 505-537.
- Warner, S.L. (1965) "Randomized Response: A Survey Technique for Eliminating Evasive Answer Bias," *Journal of the American Statistical Association* (60), 1965, pp. 63-69
- Zerbe, W.J. and Paulhus, D.L. (1987) "Socially Desirable Responding in Organizational Behavior: A Reconception," *Academy of Management Review* (12:2), April 1987, pp. 250-264.

APPENDIX: BIDR-6

Dimension	Variable	Measurement Item
Self-Deception	sde1	My first impressions of people usually turn out to be right.
	sde2*	It would be hard for me to break any of my bad habits*.
	sde3	I don't care to know what other people really think of me.
	sde4*	I have not always been honest with myself*.
	sde5	I always know why I like things.
	sde6*	When my emotions are aroused, it biases my thinking*.
	sde7	Once I've made up my mind, other people can seldom change my opinion.
	sde8*	I am not a safe driver when I exceed the speed limit*.
	sde9	I am fully in control of my own fate.
	sde10*	It's hard for me to shut off a disturbing thought*.
	sde11	I never regret my decisions.
	sde12*	I sometimes lose out on things because I can't make up my mind soon enough*.
	sde13	The reason I vote is because my vote can make a difference.
	sde14*	My parents were not always fair when they punished me*.
	sde15	I am a completely rational person.
	sde16*	I rarely appreciate criticism*.
	sde17	I am very confident of my judgments.
	sde18*	I have sometimes doubted my ability as a lover*.
	sde19	It's all right with me if some people happen to dislike me.
	sde20*	I don't always know the reasons why I do the things I do*.
Impression Management	im1*	I sometimes tell lies if I have to*.
	im2	I never cover up my mistakes.
	im3*	There have been occasions when I have taken advantage of someone*.
	im4	I never swear.
	im5*	I sometimes try to get even rather than forgive and forget*.
	im6	I always obey laws, even if I'm unlikely to get caught.
	im7*	I have said something bad about a friend behind his or her back*.
	im8	When I hear people talking privately, I avoid listening.
	im9*	I have received too much change from a salesperson without telling him or her*.
	im10	I always declare everything at customs.
	im11*	When I was young I sometimes stole things*.
	im12	I have never dropped litter on the street.
	im13*	I sometimes drive faster than the speed limit*.
	im14	I never read sexy books or magazines.
	im15*	I have done things that I don't tell other people about*.
	im16	I never take things that don't belong to me.
	im17*	I have taken sick-leave from work or school even though I wasn't really sick*.
	im18	I have never damaged a library book or store merchandise without reporting it.
	im19*	I have some pretty awful habits*.
	im20	I don't gossip about other people's business.
Note: All items are in 7-point scale and those marked with * are in reverse. Unless specified otherwise, items are measured in 7 points from "not true" (1) to "very true" (7)		