ARTICLE IN PRESS

Available online at www.sciencedirect.com
SCIENCE DIRECT®

Journal of Experimental Social Psychology xxx (2004) xxx–xxx

Journal of Experimental Social Psychology

www.elsevier.com/locate/jesp

Using implicit goal priming to improve the quality of self-report data

Kenneth A. Rasinski[a], Penny S. Visser[b,*], Maria Zagatsky[b], Edith M. Rickett[b]

[a] *NORC, The University of Chicago, USA*
[b] *Department of Psychology, The University of Chicago, 5848 S. University Avenue, Chicago, IL, USA*

Received 27 January 2004; revised 2 July 2004

Abstract

We describe a methodology that uses implicit goal priming to influence self-reports. Participants completed a vocabulary task involving either neutral words or words related to the goal of being honest. In a subsequent, ostensibly unrelated questionnaire, participants responded to a series of questions about socially sensitive behaviors involving excessive alcohol consumption. Participants who were exposed to honesty-related words admitted to having engaged in more of these behaviors than did participants who were exposed to neutral words. Results are discussed in terms of their implications for assessing sensitive behaviors in particular and for improving the quality of self-report measures in psychological research more generally, and an agenda for future research is proposed.

Introduction

A great deal of research across the social sciences relies on self-reports. Research participants are routinely asked to honestly and accurately express their thoughts, beliefs, attitudes, and values, describe their moods or other internal states, provide explanations for their judgments and decisions, or summarize their goals, their fears, or aspects of their personalities. Indeed, many of the constructs and processes of interest to social scientists would be difficult if not impossible to study without the use of self-reports.

Practitioners in a number of non-academic domains, too, rely heavily on self-report measures. When policy-makers set funding priorities, for example, it is often on the basis of prevalence estimates of various social problems. But many social problems are rooted in the private behaviors of individuals (e.g., teen pregnancy, the spread of sexually transmitted diseases, illegal drug use, sexual harassment, and domestic violence), and for prevalence information policy-makers must often rely on surveys in which people are asked to provide candid reports of private behaviors. Similarly, physicians seeking to diagnose particular disorders or determine individuals' risk levels for specific diseases must often rely on patients' self-reports of symptoms or health-relevant behaviors. Thus, accurate self-report data are crucial to the basic and applied social sciences and to real-world problem-solving across a wide range of domains.

But of course, people do not always provide candid responses to self-report questions, particularly when the questions involve sensitive information. In this paper, we describe a new method with the potential for improving the accuracy of self-report measures by implicitly activating the goal of being honest, and we provide initial evidence of its effectiveness.

Collecting sensitive information

Information is sensitive if revealing it raises concerns in respondents' minds about potential negative consequences (e.g., embarrassment, disapproval from others, and legal sanctions), or if it is simply perceived as deeply

* Corresponding author.
E-mail address: pvisser@uchicago.edu (P.S. Visser).

0022-1031/$ - see front matter © 2004 Elsevier Inc. All rights reserved.
doi:10.1016/j.jesp.2004.07.001

personal, such that inquiries about it are considered an invasion of privacy. For example, many people are uncomfortable reporting that they failed to vote in a presidential election. Voting is considered a cherished right and a fundamental duty of citizenship and people are often embarrassed to admit that they have failed to meet this basic obligation. Others are uncomfortable revealing their vote choice, viewing this as a deeply personal decision and an inappropriate question to pose. When confronted with sensitive questions, some people refuse to provide any response at all. Others provide inaccurate responses, typically those that cast them in a more favorable light. These tendencies represent a serious threat to data quality.

And indeed, there is considerable evidence that nonresponse and misreporting are significant problems for sensitive questions. For example, even when confidentiality has been assured, survey respondents routinely underreport socially undesirable behaviors, such as elective abortions (Jones & Forest, 1992), the use of illicit drugs (Anglin, Hser, & Chou, 1993; Fendrich & Vaughn, 1994), and the number of sex partners (Tourangeau & Smith, 1996). Survey respondents also tend to overreport socially desirable behavior, such as voting (Burden, 2000), exercising (Tourangeau, Smith, & Rasinski, 1997), and attending religious services (Hadaway, Marler, & Chaves, 1993). And respondents simply refuse to answer some sensitive questions, such as household income (Turrell, 2000). In the Census Bureau's monthly Current Population Survey, for example, more than a quarter of the income and wages data are missing or incomplete.

Reducing barriers to honest responding

Researchers have developed a number of strategies to overcome these tendencies, many of which attempt to allay participants' privacy concerns, thereby reducing the barriers to accurate responding. For example, researchers typically provide explicit assurances to participants that their answers will remain completely confidential. Sometimes anonymity is assured, and responses are collected in such a way that identifying information is never associated with the data, making it impossible to trace an individual participant's response back to him or her.

In addition, researchers often try to phrase sensitive questions in ways that "normalize" all responses in an effort to reduce the discomfort of providing socially undesirable answers. For example, to assess voting behavior, the National Election Studies post-election surveys pose the following question to respondents:

In talking to people about elections, we often find that a lot of people were not able to vote because they weren't registered, they were sick, or they just didn't have time. How about you—did you vote in the elections this November?

The aim is to alleviate some of the normative pressure that participants experience, increasing the likelihood that people who did not participate in the election will feel comfortable saying so.

Increasing the motivation to respond honestly

In addition, researchers often attempt to increase participants' motivation to provide thoughtful, accurate answers. These efforts typically involve impressing upon respondents the importance of the current study and the value of their responses to the research enterprise, as well as direct requests for candid, considered answers. In the current research, we explored the possibility that the goal of providing honest, accurate answers can be activated implicitly, improving data quality.

Implicit goal activation. Typically, we think of goals as desired outcomes of which we are consciously aware and toward which we deliberately strive. But recent evidence has demonstrated that goals can also be activated outside of awareness and, once activated, can motivate and direct behavior in the same ways that consciously activated goals do (e.g., Bargh, Gollwitzer, Lee-Chai, Barndollar, & Troetschel, 2001; Chartrand & Bargh, 1996).

In several studies, for example, participants who have been incidentally exposed to words related to the goal of achievement (e.g., strive, achieve, and succeed) have been shown to perform substantially better on a difficult, ostensibly unrelated subsequent task than participants who were exposed to neutral words (e.g., Bargh et al., 2001). These participants have also been shown to persist longer on the task, continuing to work on it even when they have been told to stop, and choosing to continue working on it when invited to switch to an easier and inherently more enjoyable task (e.g., Bargh et al., 2001). Interestingly, follow-up questions with these participants have revealed that they are entirely unaware of the goal-activation manipulation—when asked if they noticed a "theme" in the words to which they were initially exposed, participants routinely say no. Apparently, incidental exposure to goal-related words can activate a goal outside of awareness, producing consequences that are very similar to conscious goal activation and pursuit (e.g., Chartrand & Bargh, 1996).

In the current research, we explored the possibility that the motivation to respond honestly can be primed through incidental exposure to words related to honesty, resulting in increased disclosure of sensitive personal information. Specifically, we examined college students' willingness to report a variety of socially undesirable drinking behaviors in the context of a confidential survey. We chose this set of behaviors for two reasons.

First, the negative consequences of excessive drinking on college campuses across the country are extensive. Recent investigations have revealed that over 500,000

college students are injured each year while under the influence of alcohol; another 1400 students die each year from alcohol-related injuries; more than 70,000 college students are victims of alcohol-related sexual assault or date rape; approximately 400,000 students report having had unprotected sex after drinking and more than 100,000 students report having been too intoxicated to know whether or not they consented to having sex (Hingson, Heeren, Zakocs, Kopstein, & Wechsler, 2002; Hingson, Heeren, Zakocs, Winter, & Wechsler, 2003). And roughly one out of every four college students reports negative academic consequences of their drinking such as missing class, getting behind in their course work, performing poorly on exams, and earning low grades (Engs, Diebold, & Hansen, 1996; Presley, Meilman, & Cashin, 1996; Presley, Meilman, Cashin, & Lyerla, 1996; Wechsler et al., 2002). Across the country, colleges and universities are taking steps to reduce the frequency of excessive drinking. To assess the efficacy of these efforts, valid prevalence data are necessary. Thus, college drinking is one domain in which the methodology we have developed may have important practical implications.

Second, excessive drinking is a behavior that is well suited for our investigation because of its social undesirability. An extensive literature attests to the fact that alcohol consumption is routinely underreported. For example, estimates of alcohol consumption based on self-report measures collected from representative samples of a population account for only 40–60% of the alcohol consumption estimates based on actual sales data for that population (e.g., Midanik, 1982; Pernanen, 1974; Room, 1990). In addition, an elaborate investigation comparing the self-reported number of cans or bottles of beer consumed by the members of a random sample of households and the actual number of beer cans and bottles retrieved from household trash receptacles also revealed massive underreporting (Rathje & Hughes, 1975). In one census tract, for example, over 86% of the households reported that they did not consume any beer at all in an average week, and not a single household claimed a weekly consumption of more than 8 cans. And yet only 23% of the households had no beer cans in their garbage, whereas 54% of households had more than 8 cans (Rathje & Hughes, 1975).

Comparisons with official court records suggest that people also tend to underreport drinking and driving. In fact, one study revealed that as many as 54% of people cited for drunk driving failed to report the incident in a confidential survey (Locander, Sudman, & Bradburn, 1971). And comparisons with chemical tests of alcohol consumption (e.g., urine analysis) also reveal underreporting tendencies in self-reports (e.g., Orrego, Blendis, Blake, Kapur, & Israel, 1979).

These many investigations, utilizing a variety of different validation criteria, provide a firm foundation for making clear predictions about the impact of the experimental manipulation. If exposure to words related to the concept of honesty causes participants to respond more honestly, we should observe higher reports of alcohol consumption and alcohol-related problems.

Method

Overview

Participants completed two ostensibly unrelated questionnaires said to have been developed by different researchers and to address different topics, which were being administered together for efficiency. Each questionnaire began with an introduction ostensibly written by the contributing researcher, and the questionnaires used different formats and type fonts. The first questionnaire consisted of a vocabulary task that contained the priming manipulation: participants were either exposed to a set of neutral words or to a combination of neutral words and words related to the concept of honesty. After the vocabulary task, participants completed a survey containing a series of questions about alcohol consumption.

Participants

Sixty-four undergraduates were paid $3.00 to participate in this study. Participants were approached by an experimenter at the student center at the University of Chicago and asked if they would like to complete a brief survey. Participants sat alone at a table in the student center and completed the survey, after which they were fully debriefed and paid for their participation.

Procedure and materials

Goal-priming manipulation

The introduction to the first questionnaire explained that the study involved word meanings. In particular, the introduction explained that communication is a complicated process and that even simple words can have slightly different meanings to people. Participants read that the current research was examining how people think about particular words, or what those words mean to people. They were told that on the pages that followed, they would be presented with a series of words, and that each word would be followed by three other words that were similar to the first word. Participants were told that their task was to read each word carefully and indicate which of the three following words seemed most similar to the first word. The instructions assured participants that there were no right or wrong answers—all of the three words would be similar to the first word—and that they were simply to indicate which of those words seemed most similar to them.

In the experimental condition, participants were presented with six target words, four of which were related to the goal of being honest (e.g., honest, genuine). After each word, they were presented with three synonyms of the target word. For example, participants were presented with the word "honest," followed by the words "open," "sincere," and "truthful" and asked which of the latter words was most similar to the first. Participants in a control condition were presented with six target words that were unrelated to the goal of honest responding (e.g., blend, common), along with three synonyms for each word.

We developed this task rather than using existing procedures for implicit goal priming (e.g., word search puzzles, sentence unscramble tasks) for two reasons. First, asking participants to choose the closest synonym to words related to the target concept not only exposes participants to concept-relevant words, as the existing tasks do, it also requires them to think deeply about the concept in an effort to differentiate among a set of words that are all closely related to the concept. This struck us as a potentially highly effective procedure for priming the target concept. Second, collecting information about sensitive topics and behaviors represents a tremendous challenge for policy-makers, survey researchers, physicians, and many other practitioners. To increase the potential practical usefulness of our manipulation, we wanted to develop a procedure that could be administered verbally (e.g., in a telephone survey) as well as via self-administered paper-and-pencil, computer-based, or web-based questionnaires.

Dependent measures

A two-page "Health and Education Questionnaire" followed the priming task. The questionnaire contained several questions about sensitive alcohol-related behaviors and two questions about their own and their friends' cheating behavior. To permit an exploration of the robustness of the goal-priming manipulation, the order in which the alcohol-related questions were presented was counterbalanced across participants: some participants answered these questions immediately following the priming manipulation and others first answered the questions about cheating behavior.

It is standard practice in surveys of sensitive behaviors to assure participants of the confidentiality of their responses and to explicitly request that participants provide honest answers to the questions. To permit a comparison between this conventional practice and the current goal-priming procedures, we implemented this practice for all participants. Specifically, in the initial instructions, participants were told that all of their responses would remain completely confidential, and they were asked to respond honestly to each question. This permitted an assessment of whether implicit goal-priming encourages honest responding above and beyond standard confidentiality assurances.

Binge drinking. Participants were told that public health official define "binge drinking" as four or more drinks in one sitting for females and five or more drinks in one sitting for males. They were asked whether or not they had ever engaged in what would be considered binge drinking.

Missed class. Participants were asked whether they had ever missed a class because they drank too much alcohol the night before.

Black outs. Participants were asked if they had ever drunk so much alcohol that they had trouble remembering some of the things that they did when they were drinking.

Drinking and driving. Participants were asked if they had ever driven an automobile after they had consumed two or more drinks.

Results

Composite index

Responses to these questions were coded 0 for participants who indicated that they had never performed the behavior and 1 for participants who indicated that they had performed the behavior. A composite measure of the alcohol-related behaviors was created by summing the responses to all of the items described above, resulting in an index that ranged from zero to four. As expected, an analysis of variance (ANOVA) revealed a highly significant effect of the experimental manipulation on the composite index, $F(1, 62) = 14.05$, $p < .001$. Participants who had been exposed to words related to honesty admitted having performed significantly more of the socially undesirable behaviors than participants exposed to neutral words (Ms = 2.18 and 1.03).

Individual items

We next examined responses to each of the individual items. As is evident in Fig. 1, there was variability across the items in the magnitude of the effect, but most of the items exhibited the expected pattern. For example, 58% of participants in the neutral condition conceded that they had engaged in "binge drinking," whereas 82% of participants in the experimental condition admitted to having done so, $\chi^2(1) = 4.32$, $p < .03$. And whereas only 7% of participants in the control condition said that they had drunk so much alcohol that they had difficulty remembering the things they did while intoxicated, fully

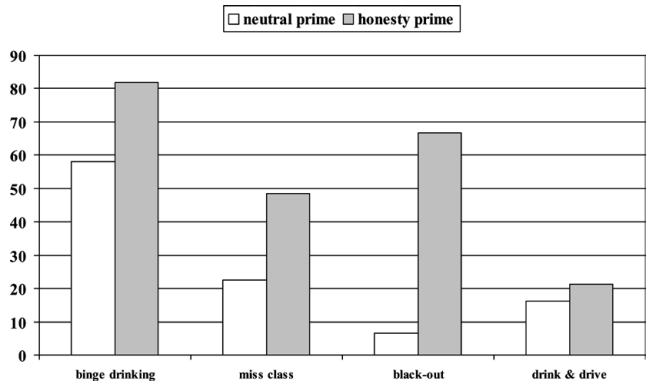

Fig. 1. Proportion of participants reporting that they have performed each sensitive behavior by experimental condition.

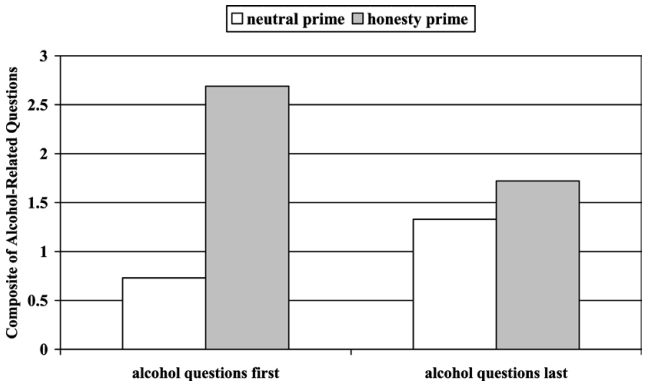

Fig. 2. Average number of affirmative responses to the alcohol-related questions by experimental condition and question-order.

67% of participants in the experimental condition said they had done so, $\chi^2(1) = 22.73$, $p < .001$. A significant effect also emerged for reports of missing class due to excessive drinking the night before.[1]

Order effects

In an effort to assess the temporal decay of the priming manipulation, we next assessed the magnitude of the priming effect among participants who reported their alcohol-related behaviors immediately following the manipulation and those who reported these behaviors after first responding to the questions about cheating behaviors.

We conducted an ANOVA on the composite index using Prime and a variable reflecting the order in which the alcohol-related questions were presented to participants as between-subjects factors. Both the Prime main effect and the Prime by Order interaction were significant, $F(1,60) = 16.11$, $p < .001$ and $F(1,60) = 7.19$, $p < .01$, see Fig. 2. Post hoc comparisons revealed that the effect of the prime was significant when the alcohol-related questions immediately followed the priming manipulation, $t(60) = 4.67$, $p < .001$, but it dropped to non-significance when the alcohol-related questions came later in the questionnaire, $t(60) = .96$, *ns*.

Discussion

Consistent with a growing body of evidence in other behavioral domains, our results suggest that incidental exposure to goal-relevant words can cause people to behave in goal-congruent ways. Specifically, participants who were presented with words related to honesty were later more willing to concede that they had engaged in socially undesirable behaviors than were participants who had been exposed to words unrelated to honesty. For several of the sensitive behaviors, the magnitude of this effect was surprisingly large. And remarkably, these differences emerged despite the fact that all participants had been assured of the confidentiality of their responses and had been explicitly asked to provide honest responses.

All of this suggests that implicit goal priming may offer a tremendously useful strategy for improving the quality of self-report data by inspiring participants to provide candid responses. This would most obviously benefit researchers who are specifically interested in assessing the prevalence of clearly sensitive behaviors, but its potential value is much broader. Many researchers pose questions for which there are more and less socially desirable responses, and these procedures may help to reduce participants' tendencies to modify their responses in an effort to portray themselves in a favorable light.

Demand characteristics?

One alternative interpretation of our findings is that instead of behaving more honestly, participants were responding to demand characteristics within the experimental context. That is, participants may have realized that the two tasks were related, despite being told otherwise. And they may have realized that rather than being an exploration of the nuances of language as they had been told, the "word meaning" task was actually intended to activate the concept of honesty. Furthermore, they may have recognized that the purpose of activating the concept of honesty was to influence their later responses, and in an effort to be "good subjects" they may have inflated their reports of sensitive behaviors.

In the current study, we did not collect debriefing measures to assess the tenability of this interpretation. But in other studies using identical experimental materials, we have collected this information. Specifically, we have asked participants open-ended questions about

[1] We also observed higher reports of cheating behavior among participants in the honesty condition (.88) than those in the control condition (.64), but this difference did not reach statistical significance, $t(58) = 1.34$, $p = .19$.

their thoughts about the study (e.g., "Did anything about the study seem unusual?") With literally one exception, none of the roughly 130 participants have said anything that indicated any awareness of the experimental hypothesis or any suspicion about the true purpose of the word meaning task. This provides tentative support our interpretation of the observed results.

Future research

Clearly, these results are preliminary and much remains to be learned about the implications of implicit goal activation for self-report data quality. We see a number of important directions for future research in this line.

Validation data

One of the complexities of studying socially sensitive behavior is the difficulty of validating people's self-reports. A number of creative investigations using a variety of sources of validation data have confirmed that alcohol consumption is routinely underreported. This lends support to our inference that higher reports of socially undesirable drinking behaviors represent more truthful responding. Nevertheless, this conclusion will be strengthened by future research that replicates these findings with independently verifiable reports.

Goal-priming versus trait-priming

Our results are consistent with the notion that honesty-related words activated the implicit goal of being honest, a goal that participants then pursued when responding to the items in the second questionnaire. It is also possible, however, that the initial vocabulary task activated the trait concept of honesty, which caused participants to behave in trait-congruent ways. There is ample evidence that the activation of a trait concept can lead to behavioral confirmation of the trait (for a review, see Wheeler & Petty, 2001). Bargh and his colleagues have identified a number of features that distinguish the operation of implicitly activated traits and implicitly activated goals (e.g., Bargh et al., 2001), but the design of the current study does not permit us to disentangle these competing accounts.[2]

Temporal decay

Our question order analysis suggests that the effects of our manipulation are quite short-lived. Additional research may identify factors that may regulate the temporal decay of the manipulation. It may be possible to strengthen the manipulation to produce longer-lasting effects, or to intersperse components of the vocabulary task with the main dependent measures to extend the effects of the prime.

Other sensitive information

This study was limited to reporting of sensitive behaviors, but it is possible that implicitly priming honesty will affect reports of socially undesirable attitudes as well. Primed with honesty, for example, people may be more willing to express prejudiced views that they genuinely hold but are reluctant to acknowledge. This would be tremendously useful for scholars seeking to identify the factors associated with lingering antipathy for members of stigmatized groups and to develop effective interventions.

Implicit goals and other threats to data quality

The implications of implicit goal priming for self-report data quality may extend well beyond improving the honesty of participants' responses. Social desirability is one of a number of threats to data quality, and it may be possible to activate other goals that minimize these other threats. For example, some self-report questions require substantial cognitive effort on the part of participants to arrive at accurate responses. Instead of putting forth this effort, some participants rely on low-effort shortcuts, often referred to as "satisficing" (e.g., Krosnick, 1991). It may be possible to implicitly motivate participants to put forth greater effort, improving the accuracy of their self-reports.

Conclusion

Across the social sciences, researchers routinely depend on self-report measures to assess constructs and processes that cannot otherwise be measured. In these endeavors, researchers depend on participants to provide candid, accurate responses to the questions posed to them, but there is ample evidence that participants do not always do so. The research reported here suggest that implicit goal priming may provide a simple, straightforward method for motivating participants to provide honest responses to self-report measures, aiding both theory-testing and real-world problem-solving.

References

Anglin, D., Hser, Y., & Chou, C. (1993). Reliability and validity of retrospective behavioral self-report by narcotics addicts. *Evaluation Review, 17*, 91–108.

[2] Past research has suggested that, whereas implicitly activated trait concepts decay over time, implicitly activated goals increase in strength over time (e.g., Bargh et al., 2001). Thus, our findings regarding temporal decay might seem to imply that our manipulation activated the trait rather than the goal of honesty. But increases in goal strength occur when people are prevented from attaining the active goal. In our investigation, participants were not prevented from achieving the goal of behaving honestly. In fact, the questions that preceded the alcohol-related questions also involved sensitive behaviors (their own and their friends' cheating behavior), providing participants with an opportunity to achieve the goal of responding honestly. Thus, the temporal decay of the priming manipulation is not necessarily informative regarding the issue of whether the trait or the goal of honesty was operating.

Bargh, J. A., Gollwitzer, P. M., Lee-Chai, A., Barndollar, K., & Troetschel, R. (2001). The automated will: Nonconscious activation and pursuit of behavioral goals. *Journal of Personality and Social Psychology, 81*, 1014–1027.

Burden, B. C. (2000). Voter turnout and the National Election Studies. 2000. *Political Analysis, 8*, 389–398.

Chartrand, T. L., & Bargh, J. A. (1996). Automatic activation of impression formation and memorization goals: Nonconscious goal priming reproduces effects of explicit task instructions. *Journal of Personality and Social Psychology, 71*, 464–478.

Engs, R. C., Diebold, B. A., & Hansen, D. J. (1996). The drinking patterns and problems of a national sample of college students, 1994. *Journal of Alcohol and Drug Education, 41*, 13–33.

Fendrich, M., & Vaughn, C. M. (1994). Diminished lifetime substance use over time: An inquiry into differential underreporting. *Public Opinion Quarterly, 58*, 96–123.

Hadaway, K., Marler, P., & Chaves, M. (1993). What the polls don't show: A closer look at US church attendance. *American Sociological Review, 58*, 741–752.

Hingson, R. W., Heeren, T., Zakocs, R., Winter, M., & Wechsler, H. (2003). Age of first intoxication, heavy drinking, driving after drinking and risk of unintentional injury among US college students. *Journal of Studies on Alcohol., 64*(1), 23–31.

Hingson, R. W., Heeren, T., Zakocs, R. C., Kopstein, A., & Wechsler, H. (2002). Magnitude of alcohol-related mortality and morbidity among US college students ages 18–24. *Journal of Studies on Alcohol, 63*, 136–144.

Jones, E. F., & Forest, J. D. (1992). Underreporting of abortion in surveys of US Women: 1976 to 1988. *Demography, 29*, 113–126.

Krosnick, J. A. (1991). Response strategies for coping with the cognitive demands of attitude measures in surveys. *Applied Cognitive Psychology, 5*, 213–236.

Locander, W., Sudman, S., & Bradburn, N. (1971). An investigation of interview method, threat and response distortion. *Journal of the American Statistical Association, 71*, 269–275.

Midanik, L. (1982). The validity of self-reported alcohol consumption and alcohol problems: A literature review. *British Journal of Addiction, 77*, 357–382.

Orrego, H., Blendis, L., Blake, J., Kapur, B., & Israel, Y. (1979). Reliability of assessment of alcohol intake based on personal interviews in a liver clinic. *Lancet, 22/29*, 1354–1356.

Pernanen, K. (1974). Validity of survey data on alcohol use. In R. J. Gibbins, Y. Israel, H. Kalant, R. E. Popham, W. Schmidt, & R. G. Smart (Eds.). *Research advances in alcohol and drug problems* (Vol. 1, pp. 355–374). New York: Plenum.

Presley, C. A., Meilman, P. W., & Cashin, J. R. (1996). *Alcohol and drugs on American college campuses: Use, consequences, and perceptions of the campus environment, Vol. IV: 1992–1994*. Carbondale, IL: Core Institute, Southern Illinois University.

Presley, C. A., Meilman, P. W., Cashin, J. R., & Lyerla, R. (1996). *Alcohol and drugs on American college campuses: Use, consequences, and perceptions of the campus environment, Vol. III: 1991–1993*. Carbondale, IL: Core Institute, Southern Illinois University.

Rathje, W. L., & Hughes, W. W. (1975). The garbage project as a nonreactive approach: Garbage in...garbage out? In H. W. Sinaiko & L. A. Broedlins (Eds.), *Perspectives on attitude assessment: Surveys and their alternatives*. Washington, DC: Smithsonian Institution.

Room, R. (1990). Measuring alcohol consumption in the United States: Methods and rationales. In L. Kozlowski, H. Annis, H. Cappell, F. Glaser, M. Goodstdt, Y. Israel, H. Kalant, E. Sellers, & E. Vingilis (Eds.). *Research advances in alcohol and drug problems* (Vol. 10, pp. 39–80). New York: Plenum.

Tourangeau, R., & Smith, T. W. (1996). Asking sensitive questions: The impact of data collection, question format, and question context. *Public Opinion Quarterly, 60*, 275–304.

Tourangeau, R., Smith, T. W., & Rasinski, K. A. (1997). Motivation to report sensitive behaviors on surveys: Evidence from a bogus pipeline experiment. *Journal of Applied Social Psychology, 27*, 209–222.

Turrell, G. (2000). Income non-reporting: Implications for health inequities research. *Journal of Epidemiology and Community Health, 54*, 207–214.

Wechsler, H., Lee, J. E., Kuo, M., Seibring, M., Nelson, T. F., & Lee, H. (2002). Trends in college binge drinking during a period of increased prevention efforts: Findings from 4 Harvard School of Public Health College alcohol study surveys, 1993–2001. *Journal of American College Health, 50*, 203–217.

Wheeler, S. C., & Petty, R. E. (2001). The effects of stereotype activation on behavior: A review of possible mechanisms. *Psychological Bulletin, 6*, 797–826.