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Do Incentives Exert Undue Influence on Survey Participation? Experimental Evidence

Eleanor Singer and **Mick P. Couper**
University of Michigan

Abstract

Monetary incentives are increasingly used to help motivate survey participation. Research Ethics Committees have begun to ask whether, and under what conditions, the use of monetary incentives to induce participation might be coercive. The article reports research from an online vignette-based study bearing on this question, concluding that at present the evidence suggests that larger incentives do not induce research participants to accept higher risks than they would be unwilling to accept with smaller ones.

Keywords

incentives; coercion; survey participation

Monetary incentives are often used to facilitate survey recruitment and motivate participation among individuals who might otherwise not respond (e.g., Church, 1993; Singer, 2002). In this article, we briefly consider the theory behind the use of incentives, review research on how incentives operate in practice, and examine research bearing on the question of whether incentives are "coercive"—that is, whether they persuade research participants to accept risks they would not otherwise undertake. Our primary focus is on behavioral rather than biomedical research, conducted with samples of the general population rather than patients, drug abusers, or other special populations.

INCENTIVES AND SURVEY PARTICIPATION

Reasons why people refuse to participate in surveys and how those reasons might affect the quality of the data collected have been widely studied (e.g., Groves & Couper, 1998; Singer, Van Hoewyk, & Neugebauer, 2003). Among these reasons are alienation from society and concerns about privacy and confidentiality. Much less attention has been paid to the motives *for* participation—why people open their door to a stranger, or spend a half hour with an unknown person on the telephone. Research suggests three main reasons: altruism (e.g., the survey furthers some purpose important to the respondent, or the respondent is fulfilling a social obligation); survey-related reasons (e.g., respondents are interested in the survey topic, or find the interviewer appealing); and egoistic reasons (e.g., I like it; the money), as well as miscellaneous other responses more difficult to categorize (Porst & von Briel, 1995; Couper et al., 2008a). As noted by Fry et al. (2006), the proportions citing each class of reasons may vary from one type of survey to another and across demographic categories (*ibid*., p. 24, and the references cited there).

Address correspondence to: Eleanor Singer, Survey Research Center, Institute for Social Research, University of Michigan, P. O. Box 1248, Ann Arbor, MI 48106. Phone: 734-647-4599; E-MAIL: esinger@isr.umich.edu..

Groves, Singer, and Corning (2000) outlined what they called "leverage-saliency theory" to describe the decision to participate in a survey. They view this decision as resulting from multiple factors—some survey-specific (e.g., topic and sponsorship), others person-specific (such as concerns about privacy), still others specific to the respondent's social and physical environment. Each factor may move a particular person toward or away from cooperation with a specific survey. Furthermore, these factors carry different weights for different persons, and they become salient when an interviewer introduces the survey and requests participation. Experimental evidence for the role of topic in stimulating survey participation has been provided by Groves, Presser, and Dipko (2004) and Groves et al. (2006).

The role of incentives in motivating survey participation has been widely documented, and two meta-analyses have described the major findings that hold across experiments using mail, face-to-face, and telephone surveys (Church, 1993; Singer et al., 1999). Both meta-analyses show that money is more effective than non-cash incentives, and that prepayment is more effective than a promised incentive. Incentives are also more effective in surveys where the response rate without an incentive is low. That is, incentives are especially useful in compensating for the absence of other motives to participate. They are also most effective in the absence of other persuasion efforts (Shettle & Mooney, 1999; Groves, Singer, & Corning, 2000).

From the perspective of leverage-saliency theory, both monetary and non-monetary incentives are inducements offered by the survey designer to compensate for the absence of factors that otherwise might stimulate cooperation—e.g., interest in the topic of the survey or a sense of civic obligation. There is some evidence that they have this effect. For example, Baumgartner and Rathbun (1997) found a significant impact of incentives on response rate in the group for which the survey topic had little salience, but virtually no impact in the high-salience group; and Martinez-Ebers (1997) reports that a $5 incentive, enclosed with a mail questionnaire, successfully motivated less-satisfied parents to continue their participation in a school-sponsored panel survey. Similar findings of the differential effects of incentives have been reported by Berlin et al. (1992) and Groves, Singer, and Corning (2000), although this compensating effect of monetary incentives has not always been found.

THE CONCEPT OF COERCION IN RESEARCH WITH HUMAN SUBJECTS

The incentives used in the studies discussed above are very modest in size, but some surveys use considerably larger monetary incentives. For example, the Health and Retirement Study, a panel study investigating health, wealth, and retirement decisions among people 50 and older, currently offers prepaid incentives of $50–$80 per married couple (the amount depends on the type of interview), and as much as $100 during the final stage of the field period to convert refusals. The National Survey of Family Growth offers $40 per respondent paid at the time of the interview, and $80 to adults in the second-phase sample (a subsample of non-final cases).

Are incentives of this size ever "coercive"? Institutional Review Boards (IRBs)[1] are increasingly raising this question, and sometimes answering it affirmatively without benefit of evidence. Elsewhere, Singer and Bossarte (2006) have considered this question theoretically, in the context of the principles underlying the U. S. Regulations for the Protection of Human Subjects (45 CFR 46) as well as the Regulations themselves, to see what light they shed on the concepts of "vulnerable populations" and "coercion." More recently, Wertheimer and Miller (2008) have also examined this issue, arriving at the same conclusion: that though incentives may be unduly influential, they can never be coercive. In this article, we review the empirical

[1]We use the U. S. term, Institutional Review Board (IRB), rather than Research Ethics Committee (REC), which is widely used in some other countries.

evidence for the proposition that “large” incentives exert undue influence on research participants, concluding with a Web experiment specifically designed to provide an answer to that question for participation in social surveys asking sensitive questions.

PARTICIPATION IN RESEARCH AS A COST-BENEFIT CALCULATION

From the perspective of the Belmont Report (see National Commission, 1979) or the Regulations for the Protection of Human Subjects or Institutional Review Boards (see U. S. Department of Health, Education, and Welfare, 1974), whether or not the decision to participate is ethically acceptable is most often considered in light of whether it is informed and voluntary. From the point of view of the decision-maker, however, participation is more likely to be viewed in an economic framework, as essentially involving a calculation of benefits and costs.

The cost-benefit framework has been cogently summarized by Dunn and Gordon (2005). Their central argument is that, since economic forces operate in any case, investigators must explicitly take them into account in motivating participation. Individuals will participate in research if they think the benefits (including, but not limited to, monetary compensation) are greater than the cost. Costs and benefits vary across both projects and individuals (*ibid*., p. 609). Like Faden and Beauchamp (1986), Dunn and Gordon emphasize the subjective variation in perceived benefits and costs.

Under what circumstances should monetary incentives be considered unduly influential? We propose that the criterion should be whether or not they induce participants to undertake risks they would not be willing to accept without the incentive. It is not enough to show, as Verheggen, Niemen, and Jonkers (1998), Willis et al. (1998), and Singer (2003) do, that participants will be more likely to take part when they perceive that benefits outweigh the risks. Nor is it enough to show that participants will accept higher risks with higher incentives, because they are also more likely to accept *lower* risks with higher incentives—incentives increase participation, regardless of the level of risk. Nor, finally, is it enough to show, as Festinger and his colleagues (2005) do, that higher incentives do not increase the *perception* of coercion. The test of whether an incentive is *unduly* influential is whether or not there is a statistically significant interaction between the size of the risk and the size of the incentive on the decision to participate.

To our knowledge, there are only two studies, both set in a biomedical context, that meet this requirement. Halpern and his colleagues (2004) showed that participation rates declined as the “costs” of a hypothetical study of medication for high blood pressure (in terms of either side effects or the control group's size) went up, and increased as the monetary compensation increased. Importantly, however, they found that the interaction between the two variables had no significant effect on participation. That is, individuals offered more compensation were unwilling to accept greater risk than those offered less compensation; and for each level of risk, an increase in compensation brought about roughly the same increase in willingness to participate. Bentley and Thacker (2004) showed that pharmacy students responding to hypothetical vignettes were more likely to indicate willingness to participate in studies offering higher incentives and less likely to indicate willingness to participate in those portraying greater risk, but again found no interaction effect between risks and incentives on the participation decision. These experiments suggest that subjects do not exchange higher pay for greater risks, which we argue is the crux of the test of undue influence.

As noted, both these experiments were set in a biomedical context. We decided to test the hypothesis that research participants would be willing to accept greater risks in exchange for higher monetary incentives in the context of social surveys asking sensitive questions. The experiment was carried out as part of a research program aiming to estimate what risk

(probability) of statistical disclosure exists in publicly available data sets, and how much disclosure risk the public is willing to tolerate.

Methods

Sample and Administration

The experiment was designed as a Web survey, which was administered by Market Strategies Inc., on a volunteer sample drawn from Survey Sampling International's Internet panel. We received 6400 completed questionnaires out of a total of 217,542 invitations sent, for a "response rate" of 2.9 percent, which is not unusual for surveys sent to Web panels. Invitees were told it was a study of survey participation, and that they would see descriptions of different types of surveys and be asked whether or not they'd be likely to take part. Respondents (who were anonymous to us) were asked at the end of the survey whether they had noticed any differences among the vignettes, and if so, what differences they noticed. Of those asked, 4603 (or 72%) reported noticing differences among the vignettes, and we restrict our analyses to these respondents. Of these, 54% were female; 19% had a high school education or less and 41% reported being college graduates; 77% were non-Hispanic whites; 23% were under 30 years old and 42% older than 50. This is not a probability sample. Our focus, to use Kish's (1987) terms, is on randomization rather than representation. We view this as an experiment with a large and diverse group of volunteer subjects, whose demographic characteristics resemble those of the general adult population. The study was approved by the University of Michigan Behavioral Sciences IRB.

Questionnaire

Each questionnaire included a set of eight fictional survey invitations, or vignettes (described below); a question about willingness to participate in these fictional surveys; and other questions designed to explore perceptions of risk and benefit which are not analyzed in the present paper (see Couper et al. 2008b). The entire questionnaire took about 16 minutes to complete.

The vignettes experimentally varied four factors: the survey topic; the description of the risk of disclosure, which was coupled with a description of the harm such disclosure might cause; the size of the incentive for participation ($10 or $50); and the mode (face-to-face or mail). In addition, we attempted to make privacy salient for half the sample at the outset by asking a few questions related to privacy concerns ("privacy prime") while the other half was given the same number of questions about a neutral topic, computer use ("neutral prime"). Four levels of disclosure risk were varied: no mention of risk; no chance of disclosure; one in a million; and one in ten. Two levels of topic sensitivity, each with two specific topics, were varied across the vignettes. The high-sensitivity topics were sexual behavior and personal finances; the low-sensitivity topics were leisure activities and work. Each vignette included a confidentiality assurance: "The information you provide is confidential." Each vignette also mentioned the study's sponsor (the National Institutes of Health), a benefit statement (tailored to the topic), and the estimated interview or survey length (20 minutes); these features were kept constant across all 32 vignettes resulting from the complete crossing of Topic × Risk-Harm × Incentive. The privacy prime and mode were between-subject manipulations.

As noted, each subject was exposed to a subset of eight of these vignettes, with each set containing all four risk statements, one each for a sensitive and a nonsensitive topic. The sets were randomly assigned to subjects after they had agreed to participate in the Web survey, and the order in which the vignettes were administered was random within subjects. All randomizations were programmed into the computerized administration of the questionnaire by MSI. An example vignette is shown below:

> "Imagine that you have cheated on your partner during the past year by having sex with another person and that a professional survey interviewer visits your home and says the following:
>
> 'My name is Mary Jones and I work for the University of Michigan Survey Research Center. We would like you to take part in a survey on sexual behavior and sexually transmitted diseases, sponsored by the National Institutes of Health. The information you provide will help shape government policy on sexually transmitted diseases.
>
> The information you provide is confidential. Based on experience, we think there is a one in 10 chance that someone will connect your name with your answers.
>
> The interview will take 20 minutes, and you will receive $10 as a token of the researcher's appreciation.'
>
> If your partner connects your name with your answers on the survey, this might result in the break-up of your relationship."

Each hypothetical harm was tailored to the specific topic of the vignette. In the vignette describing a survey about sexual behavior, above, the harm from disclosure was described as the potential break-up of the relationship; in the vignette about financial assets, the harm was described as potential discovery of tax cheating by the IRS and a resulting fine; in the vignette about a leisure-time survey, the harm was described as surprise on the part of friends who might discover the participants' amount of TV watching; in the vignette about work, the harm was described as receiving more junk mail.

In an earlier experiment, which did not make explicit the potential harm of statistical disclosure, we had not found the predicted effect of risk on willingness to participate (WTP) (Couper et al., 2008a). In the current experiment, we made the potential harm explicit, and found the predicted effect (Couper et al., 2008b). We also formulated the following hypotheses, explicitly directed at the effect of incentives and the interaction between incentive and disclosure risk-harm:

- Larger incentives will result in significantly more participation than smaller incentives;
- There will be no significant interaction between incentives and disclosure risk.

The models for testing these hypotheses are shown in Table 1 for respondents answering the first vignette only, and in Table 2 for all eight vignettes seen by a single respondent. Table 1 corresponds to a between-subjects design—that is, it tests the hypothesis on respondents exposed to only one (the first) of the eight vignettes. This model is an OLS regression, using PROC GLM in SAS 9.1. Table 2 corresponds to a within-subjects design; that is, it tests the hypothesis on those exposed to all eight of the vignettes. This model was estimated using PROX MIXED in SAS 9.1 to account for the repeated measures. The experiment by Halpern et al. (2004) was based on a within-subjects design, which maximizes the likelihood of finding support for the hypothesis because respondents can compare the several conditions with each other.

The overall effect of risk-harm is significant in both models ($F = 6.61$, d.f. = 3, 4579, $p < .001$ for the first vignette; $F = 49.0$, d.f. = 3, 31,971, $p < .0001$ for all eight vignettes), as is the incentive main effect from a model without interactions ($F = 8.74$, d.f. = 1, 4579, $p < .01$ for the first vignette; $F = 12.93$, d.f. = 1, 31,971 for all eight vignettes). The likelihood of participation decreases with increases in the risk of disclosure-harm, and is higher with the larger incentive ($50) than the smaller incentive ($10). But the overall interaction between risk and incentive is not significant in either model ($F = 0.73$, d.f. = 3, 4579, $p = .54$ for the first vignette; $F = 1.11$, d.f. = 3,31,969, $p = .34$ for all eight vignettes). This is illustrated in Figure

1. That is, as in the biomedical experiments reported earlier, respondents offered a larger monetary incentive are not thereby induced to accept a greater risk.

The model in Table 1 controls for the main effects of topic sensitivity, the privacy prime and mode. In addition, the model in Table 2 controls for the order in which the vignettes were presented and for those who gave the same WTP rating to all eight vignettes. Overall, expressed WTP is significantly lower for highly sensitive topics, for those primed on privacy, and for face-to-face survey requests (in the case of the model using all eight vignettes). We tested the three-way interactions of risk and incentive with sensitivity, privacy prime and mode respectively, and none of these interactions were statistically significant. We also explored separate models within the highly sensitive topics, those who got the privacy prime, and those in the face-to-face vignette group, and again found no effect of the risk × incentive interaction. We also tested a three-way interaction with household income to test the hypothesis that those in the lowest income group (<$25K) are more willing to accept greater risk for a larger incentive. Again we found no evidence to support this conjecture. Finally, we repeated the models in Tables 1 and 2 controlling for general attitudes toward privacy, perceived risk, and harm from survey participation, attitudes toward surveys, and general trust (results not shown); the addition of these variables does not change the general findings presented in Tables 1 and 2. In summary, the findings regarding the lack of an interaction of incentive and risk on WTP described above are robust to a number of alternative model specifications.

Discussion

Are incentives coercive? Faden and Beauchamp (1986) provided an ethical analysis of this question, concluding that while incentives may exert “undue influence,” they can never be coercive. This article has attempted to provide some empirical evidence bearing on the question. We have argued that in order to exert undue influence, larger incentives must induce respondents to accept risks they would not accept with smaller ones. None of the published experiments have found evidence to this effect, and the present experiment is no exception. Larger incentives induce greater participation than smaller ones, for larger as well as smaller risks, and larger risks induce less participation than smaller ones do. But there is no statistically significant interaction between size of risk and size of incentive; respondents do not appear to exchange higher incentives for greater risks.

The evidence offered is not, of course, definitive. First, the experiments have not tested all possible incentives; some may be so large as to produce an interaction with risk, though social, as opposed to biomedical, surveys are unlikely to offer incentives of this size. Second, most of the experiments have used hypothetical situations. Third, the experiments are typically conducted among those who have agreed to participate in the study; whether those who do not have such an inclination would react in similar fashion is not known. It is also possible that the findings would not hold among certain populations, such as “professional participants,” who repeatedly volunteer for experiments primarily in order to obtain a monetary incentive, or among especially vulnerable populations such as drug abusers (cf. Fry et al., 2006; Foddy & Savulescu, 2006). For these reasons, the possibility that some incentives may unduly influence some participants cannot be ruled out. In our view, however, the onus of demonstrating that a monetary incentive of a particular size exerts undue influence ought to be on those claiming that it does so. Unfortunately, decisions about undue influence are currently made on largely subjective grounds, and are highly variable (Ripley, Macrina, & Markovitz, 2006; for a much earlier demonstration of IRB variability in a national study, see Gray, 1977).

We believe that the size of incentives is largely irrelevant, on ethical grounds, both to the protection of subjects against harm and to informed consent. Informed consent depends on

whether subjects have been adequately informed about the survey's nature and purpose, comprehend the information they have received, and are competent to make a decision. Protection against harm requires researchers (and, secondarily, IRBs) to take adequate precautions to protect subjects from harm. It is unethical to substitute monetary incentives for these precautions, just as it is unethical to substitute informed consent for them.

It is sometimes argued that paying participants will make them reluctant to participate in future research for less than their current payment, and that this may jeopardize smaller, less well-funded studies. That may be true for participants who volunteer for many studies primarily because of financial payment. While such participants may pose a variety of problems for research, including but not limited to the need for payment, the argument does not appear to apply to panel respondents in social surveys, whose participation in follow-up waves does not appear to depend on whether or not they received a small prepaid incentive on the prior wave (Singer, Van Hoewyk, & Maher, 2000) or a refusal conversion payment on the preceding wave (Lengacher et al., 1995).

To make an informed decision about participation, respondents must be able to assess accurately the survey's physical and psychological risks of harm for them, and to decide voluntarily whether they will accept those risks. Researchers, for their part, have an obligation not only to inform respondents about risks of harm but also to minimize them. Incentives are improper when they are used to induce participation in the presence of avoidable or unreasonable risks. What is unethical in such a situation is not the use of incentives, but the failure to protect against avoidable or unreasonable risk of harm (cf. Grant & Sugarman, 2004, p. 26; Emanuel, 2005).

Best Practices

In this article we do not address the question of how large an appropriate payment for research participation should be. Fry and his colleagues (2006, pp. 26–29) evaluate a variety of payment schemes proposed by others. We, instead, make essentially three arguments in regard to the question of whether an incentive is unduly influential. First, we argue that in order to exert undue influence, incentives must induce research participants to accept risks they would not be willing to accept if they were offered a smaller incentive or none at all. This statement implies a statistical relationship: There must be a statistically significant interaction between size of risk and size of incentive if incentives are to be considered unduly influential.

Second, we argue that the judgment of whether an incentive is so large as to exert undue influence should be made on empirical, rather than subjective, grounds. This argument has several implications. First, if there are only minimal risks in research—that is, risks no greater than those in ordinary life—the size of the incentive becomes irrelevant on ethical grounds. Second, if in the judgment of the researcher or the IRB the risks are greater than this, the question of whether an incentive is so large as to exert undue influence becomes an empirical question. If the research falls within the boundaries of risk and incentive size established by existing experiments, we believe that the burden of proof should be on those who argue that the incentive is unduly large. If, however, further evidence is required, researchers should be asked to present pilot data showing the effect of varying the size of risk and the size of incentive in the particular population that is the target of the research. The accumulation of systematic evidence bearing on this question can then become the basis for best practices by the research community. (Evidence of participants' *perception* of coercion, or statements concerning whether others would perceive the payment as coercive, are not sufficient.) Finally, we argue that the most important ethical considerations involving research participation are those concerning informed consent and protections against harm. Respondents must not only receive but understand the benefits as well as the risk of harm participation in a given research project

entails. And both researchers and IRBs have a responsibility to eliminate unnecessary risks (e.g., to institute adequate disclosure protections for sensitive data) and to reduce those that remain to a minimum (e.g., arrange for interviews in settings that will not expose respondents to the view of potentially dangerous others). For further elaboration, see Singer and Bossarte (2006).

Research Agenda

More research would be useful to address the research question posed by this article. The experiments reported on here should be expanded to include a wider range of incentives, in social as well as biomedical research, and in real rather than hypothetical situations involving the full range of potential participants, including but not limited to volunteers and including vulnerable as well as general population studies.

Educational Implications

Both researchers and IRB members should pay more attention to empirical evidence relevant to the ethical decisions they make.

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Biographies

Eleanor Singer is Research Professor Emerita at the Survey Research Center of the Institute for Social Research at the University of Michigan. Her research focuses on motivation for survey participation and has touched on many important ethical issues in the conduct of surveys, such as informed consent, incentives, and privacy and confidentiality. She was a member of the National Academies panels that produced *Protecting Participants and Facilitating Social and Behavioral Science Research* (2003) and *Private Lives and Public Policies: Confidentiality and Accessibility of Government Statistics* (1993), and chaired the panel whose report, *Expanding Access to Research Data*, appeared in 2006. She is most recently a co-author of *Survey Methodology* (with Robert M. Groves and others) and a co-editor of *Methods for Testing and Evaluating Survey Questionnaires* (with Stanley Presser and others) and edited a special issue of *Public Opinion Quarterly* on nonresponse bias, published in 2006.

Mick P. Couper is Research Professor at the Survey Research Center of the Institute for Social Research at the University of Michigan, and at the Joint Program in Survey Methodology. His research focuses on issues relating to survey nonresponse and to the use of technology in survey data collection. He is co-author of *Nonresponse in Household Interview Surveys* (with Robert M. Groves) and *Survey Methodology* (with Robert M. Groves and others), and a co-editor of *Computer Assisted Survey Information Collection* and *Methods for Testing and Evaluating Survey Questionnaires* (with Stanley Presser and others).

References

Baumgartner, R.; Rathbun, P. Prepaid Monetary Incentives and Mail Survey Response Rates; Paper presented at the Annual Conference of the American Association of Public Opinion Research; Norfolk, VA. 1997.

Bentley JP, Thacker PG. The influence of risk and monetary payment on the research participation decision making process. Journal of Medical Ethics 2004;30:293–298. [PubMed: 15173366]

Berlin, M.; Mohadjer, L.; Waksberg, J.; Kolstad., A.; Kirsch, I.; Rock, D.; Yamamoto, K. An experiment in monetary incentives. American Statistical Association, Proceedings of Survey Research Methods Section; Alexandria, VA: 1992. p. 393-398.

Church AH. Estimating the effect of incentives on mail survey response rates: a meta-analysis. Public Opinion Quarterly 1993;57:62–79.

Couper MP, Singer E, Conrad FG, Groves RM. Risk of disclosure, perceptions of risk, and concerns about privacy and confidentiality as factors in survey participation. Journal of Official Statistics 2008a; 24(2):1–22.

Couper, MP.; Singer, E.; Conrad, FG.; Groves, RM. An Experimental Study of Disclosure Risk, Disclosure Harm, Incentives, and Survey Participation; Paper presented at the Annual Conference of the American Association for Public Opinion Research; New Orleans, LA. 2008b.

Dunn LB, Gordon NE. Improving informed consent and enhancing recruitment for research by understanding economic behavior. Journal of the American Medical Association 2005;293(5):609–612. [PubMed: 15687316]

Emanuel EJ. Ending concerns about undue inducement. Journal of Law, Medicine, and Ethics 2004;32:100–105.

Emanuel EJ. Undue inducement: Nonsense on stilts? American Journal of Bioethics 2005;5(5):9–13. [PubMed: 16179296]

Faden, R.; Beauchamp, TL. A History and Theory of Informed Consent. Oxford; New York: 1986.

Foddy B, Savulescu J. Addiction and autonomy: can addicted people consent to the prescription of their drug of addiction? Bioethics 2006;20(1):1–15. [PubMed: 16680876]

Fry CL, Hall W, Ritter A, Jenkinson R. The ethics of paying drug users who participate in research: A review and practical recommendations. Journal of Empirical Research on Human Research Ethics 2006;1(4):21–36.

Grant RW, Sugarman J. Ethics in human subjects research: do incentives matter? Journal of Medicine and Philosophy 2004;29(6):717–738. [PubMed: 15590518]

Gray, BH. Human Subjects in Medical Experimentation: A Sociological Study of the Conduct and Regulation of Clinical Research. Wiley-Interscience; New York: 1977.

Groves, RM.; Couper, MP. Nonresponse in Household Interview Surveys. John Wiley; New York: 1998.

Groves RM, Couper MP, Presser S, Singer E, Tourangeau R, Piani Acosta G, Nelson L. Experiments in producing nonresponse bias. Public Opinion Quarterly 2006;70:720–736.

Groves RM, Presser S, Dipko S. The role of topic interest in survey participation decisions. Public Opinion Quarterly 2004;68(1):2–31.

Groves RM, Singer E, Corning AD. A leverage-saliency theory of survey participation: description and illustration. Public Opinion Quarterly 2000;64:299–308. [PubMed: 11114270]

Halpern SD, Karlawish JHT, Casarett D, Berlin JA, Asch DA. Empirical assessment of whether moderate payments are undue or unjust inducements for participation in clinical trials. Archives of Internal Medicine 2004;164(7):801–803. [PubMed: 15078651]

Kish, L. Statistical Design for Research. John Wiley; New York: 1987.

Lengacher, JE.; Sullivan, CM.; Couper, MP.; Groves, RM. Once Reluctant, Always Reluctant? Effects of Differential Incentives on Later Survey Participation in a Longitudinal Study; Paper presented at the Annual Conference of the American Association for Public Opinion Research; Fort Lauderdale, FL. 1995.

Martinez-Ebers V. Using monetary incentives with hard-to-reach populations in panel surveys. International Journal of Public Opinion Research 1997;9:77–86.

National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. Belmont Report: ethical principles and guidelines for the protection of human subjects of research. U. S. Government Printing Office; Washington DC: 1979.

Porst, R.; von Briel, C. Waren sie vielleicht bereit, sich gegebenenfalls noch einmal befragen zu lassen?. Gründe für die Teilnahme an Panelbefragungen; Mannheim, Germany: 1995. ZUMA-Arbeitsbericht 1995: Nr. 95/04

Shettle C, Mooney G. Monetary incentives in government surveys. Journal of Official Statistics 1999;15:231–250.

Singer, E. The use of incentives to reduce nonresponse in household surveys. In: Groves, RM.; Dillman, DA.; Eltinge, JL.; Little, RJA., editors. Survey Nonresponse. Wiley-Interscience; New York: 2002. p. 163-178.

Singer E. Exploring the meaning of consent: participation in research and beliefs about risks and benefits. Journal of Official Statistics 2003;19(3):273–285.

Singer E, Bossarte R. Incentives for survey participation: when are they coercive? American Journal of Preventive Medicine 2006;31:411–418. [PubMed: 17046413]

Singer E, Van Hoewyk J, Gebler N, Raghunathan T, McGonagle K. The effect of incentives on response rates in interviewer-mediated surveys. Journal of Official Statistics 1999;15(2):217–230.

Singer E, Van Hoewyk J, Maher MP. Does payment of incentives create expectation effects? Public Opinion Quarterly 1998;62:152–164.

Singer E, Van Hoewyk J, Neugebauer RJ. Attitudes and behavior: the impact of privacy and confidentiality concerns on participation in the 2000 census. Public Opinion Quarterly 2003;67:368–384.

U. S. Department of Health, Education, and Welfare. Federal Regulations for the Protection of Human Subjects of Research. U. S. Government Printing Office; Washington, DC: 1974.

Verheggen F, Nieman F, Jonkers R. Determinants of patient participation in clinical studies requiring informed consent: why patients enter a clinical trial. Patient Education and Counseling 1998;35:111–125. [PubMed: 10026554]

Wertheimer A, Miller FG. Payment for research participation: A coercive offer? Journal of Medical Ethics 2008;34:389–392. [PubMed: 18448723]

Willis, GB.; Rasinski, KA.; Baldwin, AB.; Yeh, W. Cognitive research and responses to sensitive survey questions. U. S. Department of Health, Centers for Disease Control and Prevention, National Center for Health Statistics, Cognitive Methods Staff Working Paper 24; Washington, DC: 1998.

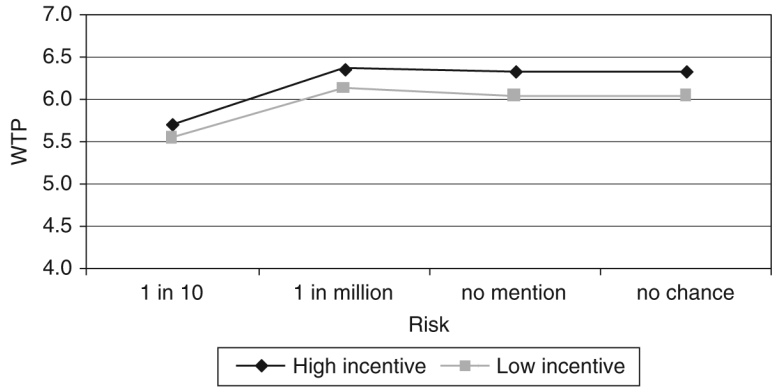

Fig. 1.
Effect of Incentive and Risk on Willingness to Participate (WTP), All Eight Vignettes.

TABLE 1

The Effect of Risk and Incentive on Willingness to Participate, First Vignette.

Variable	Parameter Estimate	Standard Error
Intercept	8.1586	0.1643***
Sensitivity (1 = high)	−2.6963	0.0983***
Prime (1 = privacy)	−0.5872	0.0986***
Mode (1 = FTF)	−0.1846	0.0982
Risk		
One in ten	−0.6976	0.1957***
One in a million	0.0158	0.1942
No mention	−0.0219	0.1966
No chance	—	—
Incentive (1 = high)	0.1735	0.1984
Risk * Incentive		
One in ten/high	0.1890	0.2782
One in a million/high	0.3115	0.2770
No mention/high	−0.0480	0.2811
No chance/high	—	—

* $P < .05$.

** $P < .01$.

*** $P < .001$. Number of observations: 4587. Model $R^2 = 0.15$

TABLE 2

The Effect of Risk and Incentive on Willingness to Participate, All Eight Vignettes.

Variable	Parameter Estimate	Standard Error
Intercept	7.8643	0.0835***
Sensitivity (1 = high)	−3.0674	0.0275***
Prime (1 = privacy)	−0.4165	0.0688***
Mode (1 = FTF)	−0.3085	0.0687***
Vignette number	−0.0356	0.0060***
Same score (1 = yes)	2.3790	0.1128***
Risk		
One in ten	−0.5070	0.0546***
One in a million	0.0882	0.0546
No mention	−0.0084	0.0546
No chance	—	—
Incentive (1 = high)	0.2863	0.0836***
Risk*Incentive		
One in ten/high	−0.1188	0.0779
One in a million/high	−0.0461	0.0779
No mention/high	.0079	0.0780
No chance/high	—	—

*$P < .05$.

**$P < .01$.

***$P < .001$. Number of clusters: 4593. Number of observations: 36,584. Model $R^2 = 0.21$