

Empirical Assessment of the Ethics of the Bogus Pipeline¹

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This study investigated the ethics of the bogus pipeline (BPL), a deceptive method used to enhance the validity of self-reported attitudes and behavior. Potential participants in BPL studies ($N = 180$) read 1 of 6 descriptions of published articles using the BPL, and provided their perceptions of the costs and benefits of using this method. Results indicate that the BPL is perceived, overall, as a useful and ethical research method. Although they might experience some unpleasant emotions when exposed to the BPL, potential participants believed that the studies using the BPL should have been conducted and that their benefits outweighed the costs. The present empirical results will allow institutional review boards, granting agencies, and other policymakers to complement value-based perspectives with utilitarian-based perspectives in making decisions regarding the use of the BPL.

Deception has been used regularly in psychological research for many decades. In fact, the use of deception has increased over the years (Adair, Dushenko, & Lindsay, 1985; Gross & Fleming, 1982; Sieber, Iannuzzo, & Rodriguez, 1995). However, at the heart of research using deception is a controversial debate over its ethics (e.g., Aguinis & Henle, in press; Baumrind, 1964, 1979, 1985; Christensen, 1988; Kelman, 1967; Seeman, 1969). As described by Rosnow (1997), the controversy regarding ethics in psychological research has been accompanied by an increasing body of rules, codification, and regulated procedures (e.g., the American Psychological Association's [APA] Ethical Principles of Psychologists and Code of Conduct; APA, 1992) and the creation of institutional review boards (IRBs) to enforce them.

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Some researchers debating ethical issues in social psychological research believe that deception should not be used (e.g., Baumrind, 1964), whereas others suggest that deception may be justified (e.g., Christensen, 1988). On both sides of the debate, researchers have long recognized the need to inform ethical decision making regarding the use of deception by conducting empirical research (Gergen, 1973; West & Gunn, 1978). Although ethical debates may not be resolved by collecting data, some have suggested that the insight that potential participants could offer about the effects of research using deception should be a critical factor in deciding the ethics of various deceptive procedures (Gergen, 1973; Sieber, 1983; Vinacke, 1954; Wilson & Donnerstein, 1976). Unfortunately, despite the call for such research, little empirical data have been gathered to provide support, or lack thereof, to claims that deception may be justified (see Fisher & Fyrberg, 1994, for a notable exception). The current study attempts to rectify this gap by empirically testing the perceived ethics of the bogus pipeline, a deceptive methodology in use for nearly three decades in several areas of social psychology (Roese & Jamieson, 1993). Moreover, we hope that the information gathered in the present study will be used as input to ethical guidelines used by social psychological researchers, IRBs, funding agencies, and other policymakers.

The Bogus Pipeline

Psychologists and other social scientists have noted the many problems associated with self-reported data (e.g., Podsakoff & Organ, 1986). Research participants often try to present themselves in a favorable light when responding to surveys and questionnaires, which makes it difficult to collect accurate data on a number of topics, especially those involving sensitive issues. Therefore, many attitudes and behaviors are overreported (e.g., positive attitudes toward minorities; Sigall & Page, 1971) or underreported (e.g., consumption of cigarettes; Aguinis, Pierce, & Quigley, 1993), depending on the social desirability associated with them. Thus, Jones and Sigall (1971) proposed the bogus pipeline (BPL) as a research tool that could overcome limitations associated with self-report measurement instruments.

The BPL involves a set of procedures that convince participants that their responses to a paper-and-pencil questionnaire will be verified independently by a biochemical or physiological apparatus. Experimenters portray the apparatus as an infallible lie detector that can measure the direction and magnitude of participants' attitudes and behaviors. Although the apparatus is a fake, when participants are convinced that the BPL is effective, they are motivated to give more accurate responses and less socially desirable ones than they would with other self-report methods (Jones & Sigall, 1971). Thus, this bogus procedure is intended to be a pipeline to the soul (Jones & Sigall, 1971). The BPL is effective not only in reducing social desirability, but it also overcomes many

other problems associated with self-reported data, such as demand characteristics, impression management, and careless responding (Roese & Jamieson, 1993).

The BPL allows researchers to gather valid information that may otherwise be unattainable because of participants' embarrassment or defensiveness (Sieber, 1982). Because of this, there has been an increased interest in the BPL, as evidenced by three meta-analytic reviews of over 60 published studies that used the BPL (Aguinis et al., 1993; Aguinis, Pierce, & Quigley, 1995; Roese & Jamieson, 1993). Indeed, the BPL continues to be used regularly (e.g., Derakshan & Eysenck, 1999; Ellemers, Spears, & Doosje, 1997; Tourangeau, Smith, & Rasinski, 1997; Yzerbyt, Leyens, & Corneille, 1998) and has been used already to examine research areas of interest to several social psychological specialties. Examples include group dynamics (Ellemers et al., 1997); attitude change (e.g., Malkis, Kalle, & Tedeschi, 1982; Riess, Kalle, & Tedeschi, 1981; Stults, Messe, & Kerr, 1984); causal attributions (e.g., Arkin, Appelman, & Burger, 1980; Mikulincer & Marshand, 1991; Riess, Rosenfeld, Melburg, & Tedeschi, 1981); drug, alcohol, cigarette, and marijuana use (e.g., Aguinis et al., 1993, 1995; Hansen, Malotte, & Fielding, 1985); personality (Eisenberg et al., 1989); attraction (e.g., Jones & Wein, 1972; Page & Moss, 1975; Sigall & Page, 1972); motivation (Kunda & Schwartz, 1983); gender-role attitudes (Bowman & Auerbach, 1978); gender attitudes (Hough & Allen, 1975; Ward, 1978); racial attitudes (e.g., Brigham, Bloom, Gunn, & Torok, 1974; Cherry, Byrne, & Mitchell, 1976; Schlenker, Bonoma, Hutchinson, & Burns, 1976); and reactions to inequity (Rivera & Tedeschi, 1976).

Overall, the meta-analytic evidence gathered thus far suggests that the BPL elicits more valid reports of attitudes and behaviors, as compared to self-report questionnaires. For instance, Roese and Jamieson's (1993) meta-analytic review yielded a mean effect size (d) of .40 between BPL (i.e., self-reports using the BPL) and non-BPL (i.e., self-reports alone) conditions in the expected direction. That is, using the BPL decreased socially desirable responding by almost one half of a standard deviation. Also, the meta-analysis conducted by Aguinis et al. (1993) yielded an average effect size of .13. This effect size represents the standardized difference between the proportion of self-reported smokers in BPL and non-BPL conditions. In other words, more individuals report their smoking behavior in a BPL condition, as compared to a non-BPL condition. Admittedly, this is a smaller effect size than the one found for social psychological research in general by Roese and Jamieson. However, for some conditions (e.g., more credible BPL), the effect was found to be larger. In sum, the cumulative evidence gathered thus far suggests a documented benefit to using the BPL in social psychological research. In spite of these benefits, the BPL, like other research methods involving deception, has been questioned regarding the ethics of its use.

Ethical Concerns of Using the BPL

In general, ethical concerns about deceptive research methods have been debated widely (Aguinis & Henle, *in press*). Critics of deception have argued against its use because it violates the moral principles of ethical treatment proposed by the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978): beneficence, respect for autonomy, and justice. First, it has been claimed that harm to participants is not minimized and that few benefits are realized from using deception (*i.e.*, beneficence is violated). Second, it has been argued that respect is not given to participants' rights, dignity, and freedom to decline participation when deception is used in research. Finally, critics of deceptive methodologies argue that the risks associated with deception and the benefits that may result from its use are not distributed equitably. That is, participants carry all of the burden of the negative effects that may result from exposure to deception, while a limited few receive the benefits. Advocates of the use of deception in social psychological research retort that steps are taken by researchers and are enforced by IRBs to ensure that these principles are upheld. First, research studies are evaluated to establish that the benefits outweigh the harm that might result to participants. Second, participants have the right to withdraw, without penalty or prejudice, at any time during a study. Finally, some have argued that it is morally inappropriate and harmful to the field of social psychology not to conduct research on important topics (Baron, 1981; Christensen, 1988; Gergen, 1973; Sigall, 1997; West & Gunn, 1978).

Shortly after Jones and Sigall (1971) proposed the use of the BPL, Ostrom (1973) questioned its ethics. Ostrom argued that the BPL might coerce participants into recognizing and admitting truths about themselves that may be stressful and harmful to their self-esteem. Also, Ostrom argued that being deceived might lead to less trust in psychologists, as well as people in general. However, Jones and Sigall (1973) retorted that very few participants have become upset as a result of the BPL.

More recently, Aguinis and Handelsman (1997a) presented a debate between the two positions likely to be taken by social psychologists concerned about the ethics of the BPL. The first side of the debate argues against using the BPL. This side argues that the BPL is a unique deceptive research method that involves actively lying to participants, forcing them to disclose information that may be personal or sensitive, preventing participants from freely withdrawing, and generating an image of psychologists as people who regularly lie. Therefore, this position argues that the BPL should never be used because it violates participants' dignity, privacy, and autonomy; and because it risks losing the trust and respect that participants have in the experimenter and in the field of psychology. The other side of the debate favors using the BPL. According to this second position, the BPL would be justified if the benefits outweigh the costs to participants.

Therefore, the BPL is ethical as long as the negative consequences resulting from it are minor compared to the value to participants or society in general of conducting the study. Also, the BPL would be ethical if no other research method is feasible or more beneficial than the deception.

In a response to Aguinis and Handelsman (1997a), Sigall (1997) pointed out that participants are able to withdraw if the information being gathered is too sensitive and that participants are also likely to reveal personal information with other research methods, such as personality tests. Thus, Sigall refuted some of the allegations against the BPL by emphasizing that it does not raise unique concerns; rather, it is like any other method of deception. However, in a response to Sigall's article, Aguinis and Handelsman (1997b) concluded that this debate could not be resolved without empirical evidence, and, therefore, they proposed a research agenda to evaluate participants' reactions to the BPL to determine the method's ethical status.

In short, there is a considerable body of literature addressing ethical issues in the use of the BPL from the perspective of values and ethical principles. However, there is a lack of empirical evidence to inform this debate. We recognize that data do not substitute values and moral judgments. In fact, Aguinis and Handelsman's (1997a) article delineated clear differences between a deontological (i.e., value-based) and a utilitarian (i.e., data-based) approach to deciding about the ethics of using the BPL. Nevertheless, like many others (e.g., Gergen, 1973; Sieber, 1983; Vinacke, 1954; Wilson & Donnerstein, 1976), we believe that data can complement value-based decisions and provide useful information.

In sum, the use of the BPL in research faces an ethical dilemma, as do other methods of deception. While some have argued that it is morally inappropriate to expose participants to lies and deceit, others have lamented about the moral cost of not doing research on important issues that can only be explored by using deception. However, there has been no empirical research examining the potential negative consequences of using the BPL in research settings (Aguinis & Handelsman, 1997a). The present study seeks to evaluate empirically the research issues raised by Ostrom (1973), Jones and Sigall (1973), and more recently by Aguinis and Handelsman (1997a, 1997b) and Sigall (1997) to provide data that will help inform the debate over the ethics of the BPL. Thus, by adopting a utilitarian perspective (i.e., deception is justified if the benefits outweigh the costs), the goal of the present study is to gather data that will allow the debate on ethics to occur, in addition to the arena of personal opinions and values, in the empirical arena.

Hypotheses

From the meta-analyses conducted on BPL research (Aguinis et al., 1993, 1995; Roese & Jamieson, 1993), we know about the benefits of the method.

However, we do not know about the ethics-related costs associated with it. The present study assesses potential costs by investigating hypotheses regarding perceptions of (a) importance and effectiveness of research using the BPL, (b) participants' reactions during a BPL study, (c) participants' reactions to being deceived using the BPL, and (d) costs to participants versus benefits to society resulting from using the BPL.

Although no empirical research has examined if the BPL is perceived as ethical, a body of literature has examined deceptive techniques in general. Using evidence gathered in this area, we tested hypotheses in each of the four aforementioned types of perceptions for their generalizability to the BPL methodology. In addition, as is described in the Method section, because the consequences of using the BPL on study participants are unknown, participants in the present study were not actually subjected to the BPL procedure. Instead, we tested hypotheses regarding how potential participants in BPL studies perceive the ethics of the BPL in six research areas in which the BPL is typically used. As is described in the Method and Discussion sections, this approach to examining the ethics of the BPL is necessary because, at present, there is no empirical evidence to rule out potential harm to participants exposed directly to the BPL.

Importance and Effectiveness of Research Using the BPL

Fisher and Fyrberg (1994) asked college students, the group most often exposed to the BPL, about their views on deceptive research methods in general. Participants in the study read summaries of published articles that used deception (none of the studies that were summarized had used the BPL). They found that most students believed that studies containing deception were important and held scientific value. In addition, participants in previous deceptive research have stated that deception is necessary to study human behavior in experimental settings (Gerdes, 1979; Sharpe, Adair, & Roese, 1992). In fact, the majority of participants believed that not being told the true purpose of the study and being deceived were somewhat appropriate during experiments (Epstein, Suedfeld, & Silverstein, 1973). Also, college students believed that, in general, deceptive research methods are effective and believable (Fisher & Fyrberg, 1994). Further, the same students realized that deception offers methodological advantages over other methods of gathering information (Fisher & Fyrberg, 1994). Moreover, participants in Fisher and Fyrberg's study concluded that using deception was important even when they were aware that other ways of gathering information existed, such as role playing or questionnaires. Therefore, we offer the following hypotheses:

Hypothesis 1a. Studies using the BPL will be perceived as important and valid.

Hypothesis 1b. The BPL will be perceived as an effective research method.

Hypothesis 1c. The use of the BPL will be perceived as important, even when information could be gathered through alternative methods.

Reactions During the Study

Many researchers have claimed that participants feel uncomfortable or experience other negative feelings during studies using the BPL and other deceptive techniques (Baumrind, 1964; Kelman, 1967; Ostrom, 1973). On the other hand, studies asking participants who have participated in studies using deception about their experiences have found positive reactions. In Milgram's (1964) obedience study, only 1.3% of the participants had negative feelings, and Smith (1981) found that none of the participants who experienced deception believed that it was harmful and only one said that it was a negative experience. Moreover, when Smith compared the negative reactions of deceived versus nondeceived groups, he found that more individuals had negative experiences in the group that was not exposed to deception (5.9%) than did those experiencing deception (2.8%). However, students evaluating deception used in published studies believed that participants may have felt embarrassed, sad, or uncomfortable during the study (Fisher & Fyrberg, 1994). Also, Wilson and Donnerstein (1976) found that individuals perceived that participants in deceptive research would feel harassed, depending on the type of study. Therefore, we offer the following hypothesis:

Hypothesis 2. Participants in BPL studies will be perceived as being more uncomfortable admitting to socially undesirable behaviors and attitudes than will those participants in studies in which the BPL is not used.

Reactions to Deception

When told by the experimenter that the study in which they participated involved deception and that the BPL was not real, participants may experience a number of feelings and emotions. Initially, participants may respond with disbelief toward the researcher. This would be an important negative consequence for the reputation of psychological researchers and the field of psychology in general. However, Fisher and Fyrberg (1994), who asked college students if participants in deceptive research would believe the researcher when they were informed about the deception, found that they would believe the researcher's explanation. In addition, Sharpe et al. (1992) concluded that 20 years of using deception in psychological research has not produced participants who are

distrustful or negative toward researchers and the field of psychology. Therefore, the following hypothesis is proposed:

Hypothesis 3a. Participants in BPL studies will be perceived as believing the experimenter when told that the true purpose of the study was to deceive them into revealing information about their beliefs, attitudes, or behaviors.

Participants in BPL studies may experience a variety of negative emotions when they realize the true purpose of the study and that they had been deceived. Some researchers have found that participants involved in research using deception reported that they enjoyed it and that it was a positive experience (Smith & Richardson, 1983), and that they did not find it objectionable (Gerdes, 1979; Pihl, Zaccchia, & Zeichner, 1981). However, when undergraduates were asked about their perceptions of individuals experiencing deception, they reported that at least half would be embarrassed and annoyed when told that they were deceived (Fisher & Fyrberg, 1994).

Hypothesis 3b. Participants in BPL studies will be perceived as embarrassed, distressed, and annoyed when told the true purpose of the study and when they learn that the experimenter had deceived them.

If participants are upset because of the deception, they may not let experimenters know how they feel. This can be problematic because researchers need to ensure that debriefing procedures alleviate any psychological discomfort that participants may be experiencing as a result of the deception. However, if participants are too uncomfortable to inform researchers about the negative emotions that they feel as a result of the BPL, there is not much that researchers can do. There is some evidence suggesting that participants may be unwilling to report their embarrassment to experimenters (Fisher & Fyrberg, 1994).

Hypothesis 3c. Participants in BPL studies will be perceived as unwilling to tell the researcher if they are embarrassed, annoyed, or distressed at the true purpose of the study or at being deceived by the researcher.

Psychologists have long believed that the willingness of individuals to volunteer for research may be thwarted if the exact nature of the study is known, especially when the research involves deception (Sullivan & Deiker, 1973). Empirical evidence examining this issue leads to mixed conclusions. Smith and Berard (1982) found that 65% of their participants would volunteer for a study using

deception to examine conformity. Moreover, it has been shown that participants are willing to tell friends to participate in studies involving deception (Gerdes, 1979), as well as volunteering themselves even when they know exactly what the study will entail (Collins, Kuhn, & King, 1979). However, Wilson and Donnerstein (1976) ascertained that participants would not volunteer for some studies using deceptive methods, and Collins et al. discovered that participants are less likely to agree that others would volunteer for studies using deception. Therefore,

Hypothesis 3d. Participants in BPL studies will be perceived as unwilling to participate in studies if they are told that the studies might involve some deception, embarrassment, or being hooked to a lie detector.

Costs to Participants Versus Benefits to Society

The ethics of research using deception has often been determined by comparing the negative consequences incurred by participants to the benefits of the scientific knowledge that is gained. If the benefits outweigh the costs, the research is believed to be justified. Unfortunately, it is hard to quantify the costs and benefits of doing this type of research, and no studies have asked participants if they believe that the costs they perceive from the BPL outweigh the BPL's perceived benefits. However, most research conducted on deception has found that, in general, participants believe that it is justified by the research's benefit to society or by its scientific purpose, and that these benefits outweigh the costs (Collins et al., 1979; Sullivan & Deiker, 1973). For instance, 71% of participants in a study by Smith and Berard (1982) believed that they would benefit from participating in research that involved deception, whereas 4% believed that they would definitely be harmed by participating. In addition, most participants believed that research using deception should be conducted (Fisher & Fyrberg, 1994; Smith & Berard, 1982). Thus,

Hypothesis 4a. The benefits to society from BPL studies will be perceived as outweighing the costs to participants.

Hypothesis 4b. The majority of participants will indicate that the BPL studies should have been conducted.

Impact of Condition

Hypotheses 1 to 4 will be tested to investigate if they differ depending on the type of research for which the BPL is used (e.g., racial attitudes vs. cigarette smoking). Some studies have found that evaluations of research using deception depend on the topic area being explored (Gerdes, 1979; Wilson & Donnerstein, 1976). For instance, we speculate that BPL studies assessing cigarette smoking

may be viewed more negatively, as compared to BPL studies assessing a less sensitive topic, such as motivation about helping behavior. Therefore, prospective participants may react differently to the BPL, depending on its research purpose. However, we do not have specific hypotheses regarding this exploratory issue. Thus, the following question is posed:

Research Question. Will the area of research in which the BPL is used affect participants' reactions and attitudes toward the BPL?

Method

Participants

Data for this study were obtained from 180 undergraduates in Introductory Psychology courses at a western university who received course credit for participating. We used a sample of undergraduate students because this is the population most frequently used in BPL studies (Aguinis et al., 1993; Roese & Jamieson, 1993) and, consequently, undergraduate students are the most likely participants in actual BPL studies. A perusal of the over 60 studies that were meta-analyzed by Aguinis et al. (1993, 1995) and Roese and Jamieson (1993) indicates that the vast majority of participants consisted of undergraduate students, perhaps because of convenience. Thus, using undergraduates enhances the generalizability of the results because most published studies using the BPL have included the same type of participants.

The majority of the sample consisted of 127 freshmen and sophomores (72%), and approximately 112 (63%) were female. The average age of the participants was 22 years, with ages ranging from 17 to 45 years. Most of the sample consisted of 105 Anglo European Americans (62%), followed by 27 Latinos (16%), 16 Asian Americans (9%), 10 Other (9%), and 7 African Americans (4%). (Percentages are based on the 176, 178, and 169 participants who completed information regarding class status, gender, and ethnicity, respectively.)

Procedure

The ethics of using the BPL is a controversial issue because the consequences of using the method are unknown. As described in this paper's introduction, several critics of the BPL have argued that this methodology might harm study participants and thus should not be used (Aguinis & Handelsman, 1997a; Ostrom, 1973). Consequently, we believed that participants in our study should not be exposed directly to the BPL.

Fisher and Fyrberg (1994) faced a similar dilemma when they explored the ethics of deception in general. These researchers solved the dilemma by asking

college students to evaluate three previously conducted studies that used deception on the dimensions of scientific validity, personal reactions, and ethics. In this way, they avoided exposing study participants directly to a potentially harmful methodology. We adopted their method and used prospective participants to examine the effects of the BPL to avoid subjecting anyone to a potentially unethical procedure.

Similar to the method described by Fisher and Fyrberg (1994), participants read one of six summaries of published articles that used the BPL. These articles (see Materials section) were chosen to represent the major areas of research in which the BPL has been used, as summarized by the meta-analytic reviews (Aguinis et al., 1993, 1995; Roese & Jamieson, 1993). For each article, participants were provided with a summary including (a) purpose, (b) participants, (c) procedures, (d) results, and (e) conclusions. Also, each summary contained a brief description of the BPL. Prior to data collection, a pilot study was conducted to ensure the readability and clarity of each summary and questionnaire, including the dependent variables. Undergraduates ($N = 40$) from the Introductory Psychology course who were not subsequently used in the main study read the instructions, one of the six summaries, and the set of dependent measures. Then, they provided feedback during an interview with the experimenters on any materials that were unclear and needed revision. The article summaries were revised for readability and clarity. In the main study, 30 participants were randomly assigned to each of the six conditions (i.e., summaries of previously published articles).

Materials

The first condition included a summary of Sigall and Page (1971), who investigated racial attitudes by asking undergraduates to rate how well various traits applied to African Americans and Whites. Condition 2 included a summary of Evans, Hansen, and Mittelmark (1977), who sought to determine if children aged 13 to 14 years would admit more cigarette smoking behavior using the BPL, as compared to a non-BPL condition (i.e., questionnaire only). Condition 3 included a summary of Kunda and Schwartz (1983), who investigated the motivation behind helping behavior in undergraduates. Condition 4 included a summary of Sigall and Page (1972), who explored the feelings that college students held toward an obnoxious disabled individual. Condition 5 included a summary of Jones and Wein (1972), who examined attraction toward similar and dissimilar people, also using undergraduate students as participants. Finally, Condition 6 included a summary of Gaes, Kalle, and Tedeschi (1978), who explored attitude shifts in undergraduates when they chose to publicly behave in a way that was not consistent with their attitudes.³

³The summaries used in the present study are available from the first author upon request.

After reading one of the six descriptions of previously published studies using the BPL, participants responded to a questionnaire including items testing the hypotheses that were set forth in the introduction. The questionnaire was tailored after Fisher and Fyrberg's (1994) survey and included 22 items. Responses to 19 items were on 7-point Likert-type scales (see Table 1 for items and anchors). In addition, the questionnaire included the following three questions, which were measured on categorical scales: (a) "Do you believe the study should have been conducted? (*Yes/No*)"; (b) "Have you discussed research ethics in your Introductory Psychology class? (*Yes/No*)"; and (c) "If *Yes*, have you discussed research ethics regarding deception research? (*Yes/No*)."

Participants also provided demographic information and were fully debriefed regarding the purpose of the study.

Results

Table 2 includes the correlation matrix among all dependent measures measured on Likert-type scales. Two-way ANOVAs (i.e., Condition \times Demographic Variable) were conducted to determine if demographic variables were related to how participants evaluated the six conditions. There were no main or interactive effects as a result of gender or ethnicity, so the data were collapsed across these variables for all subsequent analyses. Further, there were no main effects as a result of whether participants had learned about ethical issues in research during an Introductory Psychology course. One-way ANOVAs and chi-square analyses were used to compare the dependent variables across the six conditions.

We then conducted post-hoc Scheffé tests as a follow-up to the statistically significant omnibus ANOVAs to investigate specific differences among the six conditions. We chose the Scheffé test over other, more liberal tests (e.g., Tukey's HSD, Tukey's LSD) because we did not have any *a priori* hypotheses regarding specific differences among the six conditions (cf. research question). Table 2 includes the means, standard deviations, *F* statistics, and effect-size estimates for tests of Hypotheses 1 to 4 across the six conditions.

Importance and Effectiveness of Studies Using the BPL

Overall, as shown in Table 1, participants believed that the research topics and results of the BPL studies were somewhat important. In addition, participants perceived the BPL as an effective research method and believable as a lie detector. Further, even when alternative methods, such as surveys and interviews, are available to gather information, participants still perceived it as important to use the BPL. However, related to the research question, its perceived effectiveness depends on the condition, $F(5, 174) = 4.41, p < .01$. Subsequent Scheffé tests showed that there were differences between the study examining the smoking habits of children and those investigating adult helping behavior and attraction

Table 1

Means, Standard Deviations, F Statistics, and Effect-Size Estimates Across the Six Bogus Pipeline Conditions

Question	<i>M</i>	<i>SD</i>	<i>F(df)</i>	η^2
Importance and effectiveness				
Importance of research area ^a	5.22	1.26	1.71 (5, 174)	.047
Importance of results ^a	5.34	1.16	1.25 (5, 174)	.035
Effectiveness of BPL ^b	5.41	1.13	4.41 (5, 174)**	.112
Importance of BPL vs. other methods ^a	5.18	1.45	0.26 (5, 174)	.007
Reactions during study ^c				
Uncomfortable in BPL studies ^d	4.55	1.16	12.55 (4, 145)***	.257
Uncomfortable in non-BPL studies ^d	3.43	1.33	1.51 (4, 145)	.040
Reactions to deception ^c				
Embarrassed	4.98	1.35	3.24 (5, 173)**	.086
Annoyed	4.38	1.63	7.14 (5, 173)***	.171
Distressed	4.14	1.47	3.79 (5, 173)**	.099
Reactions to experimenter				
Believed experimenter ^e	5.47	1.18	0.96 (5, 173)	.027
Embarrassed ^f	3.75	1.51	1.53 (5, 173)	.042
Annoyed ^f	3.75	1.65	1.40 (5, 174)	.039
Distressed ^f	4.14	1.44	0.92 (5, 174)	.026
Report feelings ^g				
If upset at deception	3.49	1.68	1.30 (5, 174)	.036
If upset at experimenter	3.72	1.80	0.68 (5, 174)	.019
Willingness to participate ^h				
If told about deception	3.29	1.38	1.38 (5, 174)	.038
If told about lie detector	2.91	1.38	2.01 (5, 174)	.054
If told about embarrassment	2.29	1.15	2.09 (5, 174)	.057

(table continues)

Table 1 (Continued)

Question	<i>M</i>	<i>SD</i>	<i>F(df)</i>	η^2
Costs versus benefits ⁱ				
Benefits outweigh costs	4.66	1.27	2.42 (5, 172)*	.066

Note. Items were rated on 7-point Likert-type scales. A statistically significant *F* test indicates that responses were affected by condition (cf. research question). Condition 1 = racial-attitudes study (Sigall & Page, 1971); Condition 2 = cigarette-smoking-in-children study (Evans et al., 1977); Condition 3 = helping-behavior study (Kunda & Schwartz, 1983); Condition 4 = attitudes-toward-the-disabled study (Sigall & Page, 1972); Condition 5 = attraction study (Jones & Wein, 1972); Condition 6 = attitude-shift study (Gaes et al., 1978).

^a1 = *unimportant* to 7 = *very important*. ^b1 = *ineffective* to 7 = *very effective*. ^c1 = *not uncomfortable/embarassed/distressed/annoyed* to 7 = *very uncomfortable/embarassed/distressed/annoyed*. ^d Condition 5 was omitted from this analysis because of a coding error that led to losing the data corresponding to this item. ^e1 = *did not believe experimenter* to 7 = *believed experimenter*. ^f1 = *very embarrassed/distressed/annoyed* to 7 = *not embarrassed/distressed/annoyed*. ^g1 = *most would not tell* to 7 = *most would tell*. ^h1 = *would be much less willing to participate* to 7 = *would be much more willing to participate*. ⁱ1 = *costs to participants are much greater than the benefits to society* to 7 = *benefits are much greater than costs*.

* $p < .05$. ** $p < .01$. *** $p < .001$.

(Table 3). Participants believed that the BPL was most effective at motivating children to reveal their smoking habits ($M = 6.07$), while it was least effective at learning about the motivation behind helping behaviors ($M = 4.93$) and attraction ($M = 5.03$). In sum, studies using the BPL are believed to be important and valid, regardless of whether alternative research methods are available. These results provide support for Hypotheses 1a, 1b, and 1c.

Reactions During the Study

Table 1 shows that participants taking part in BPL studies were perceived as more uncomfortable than those who were not exposed to the BPL. Again, the research question played a role in that the magnitude of perceived discomfort experienced during the BPL studies depended on the condition, $F(4, 15) = 12.553$, $p < .001$ (Table 3). According to the Scheffé test, differences arose between the study examining the smoking behaviors of children ($M = 5.70$) and the studies on adult racial attitudes ($M = 4.37$), helping behaviors ($M = 4.08$), attitudes toward the disabled ($M = 4.20$), and attitude shifts ($M = 4.40$), with children perceived as more uncomfortable during the study than adults. Therefore,

Table 2

Correlations Among All Dependent Variables Measured on Likert-Type Scales

	1	2	3	4	5	6	7
1. Importance of research area ^a	—						
2. Importance of results ^a	.337***	—					
3. Effectiveness of BPL ^a	.139	.266***	—				
4. Importance of BPL vs. other methods ^a	.374***	.323***	.273***	—			
5. Uncomfortable in studies using BPL ^d	.044	-.114	.078	.040	—		
6. Uncomfortable in studies not using BPL ^d	-.234**	-.197*	-.089	-.120	.260**	—	
7. Embarrassed about deception ^b	.078	-.022	.215**	.082	.255**	.146	—
8. Annoyed about deception ^b	.018	-.022	.104	-.054	.346***	.188*	.304***
9. Distressed about deception ^b	.157*	-.024	.116	.079	.436***	.275**	.460***
10. Believed experimenter ^b	.140	.062	.082	.219**	-.049	-.057	.023
11. Embarrassed by experimenter ^b	-.150*	.015	-.111	-.236**	-.227**	-.031	-.502***
12. Annoyed by experimenter ^a	-.003	.155*	-.005	.066	-.174*	-.124	-.185*
13. Distressed by experimenter ^a	-.063	.039	-.011	-.093	-.283***	-.159	-.279***
14. Report feelings about deception ^a	-.135	.009	-.055	.025	-.048	.084	-.075
15. Report feelings about experimenter ^a	-.084	.033	-.100	.005	-.141	.047	-.110
16. Participate in studies with deception ^a	-.049	.095	.050	.018	-.079	-.066	-.009
17. Participate in studies with lie detectors ^a	.044	-.041	-.005	.036	-.179*	-.044	-.257**
18. Participate in studies with embarrassment ^a	-.141	-.059	-.054	-.026	-.049	.100	-.019
19. Benefits outweigh costs ^c	.311***	.371***	.030	.159*	-.142	-.077	-.146

^aN = 180. ^bN = 179. ^cN = 178. ^dN = 150.**p* < .05. ***p* < .01. ****p* < .001.

participants were perceived to be more uncomfortable in studies using the BPL, but this depended on the type of research conducted and the study participants (i.e., children vs. adults). These results provide support for Hypothesis 2.

Reactions to Deception

Overall, it was perceived that participants in BPL studies would believe or would be just a little skeptical when the experimenter revealed the deception.

8	9	10	11	12	13	14	15	16	17	18
—										
.477***	—									
.008	-.100	—								
-.056	-.254**	.012	—							
-.508***	-.272***	.028	.191*	—						
-.182*	-.363***	.135	.459***	.447***	—					
.038	-.007	.046	.190*	-.016	.097	—				
-.029	-.059	.060	.183*	-.106	.007	.551***	—			
-.276***	-.238**	.075	.031	.329***	.112	.064	-.070	—		
-.217**	-.324***	.051	.079	.165*	.122	.087	-.010	.242**	—	
-.152*	-.074	-.024	.064	.048	-.011	.160*	.178*	.319***	.268***	—
-.108	-.118	.125	.011	.171*	.118	-.060	-.054	.071	.135	.003

Further, the results show that participants in BPL studies were believed to be somewhat embarrassed, annoyed, and distressed when the deception and true purpose of the study were revealed (Table 1). These results provide support for Hypotheses 3a and 3b.

The F statistics indicate that perceived reactions of the participants to deception depended on the condition (Table 3). First, the condition affected the perceived level of participant annoyance, $F(5, 173) = 7.140, p < .001$. Participants in the cigarette smoking study ($M = 5.57$) were believed to be more annoyed than

Table 3

Means of Dependent Variables Differentially Affected Across the Six Bogus Pipeline Conditions

Question	Condition (<i>N</i> = 30 per condition)					
	1	2	3	4	5	6
Effectiveness of BPL	5.37 _{ab}	6.07 _a	4.93 _b	5.40 _{ab}	5.03 _b	5.63 _{ab}
Uncomfortable in BPL studies ^a	4.37 _a	5.70 _b	4.08 _a	4.20 _a	—	4.40 _a
Reacted to deception						
with embarrassment	5.33 _a	5.57 _a	4.53 _a	4.87 _a	4.50 _a	5.10 _a
with annoyance	4.87 _{ab}	5.57 _a	4.37 _{ab}	3.77 _b	3.60 _b	4.10 _b
with distress	4.40 _{ab}	4.97 _a	3.83 _{ab}	4.23 _{a,b}	3.60 _b	3.79 _{ab}
Benefits outweigh costs	4.90 _a	4.21 _a	4.80 _a	5.17 _a	4.40 _a	4.50 _a

Note. Means with the same subscripts are not significantly different at $p < .05$ by the Scheffé method for post-hoc comparisons. Condition 1 = racial-attitudes study (Sigall & Page, 1971); Condition 2 = cigarette-smoking-in-children study (Evans et al., 1977); Condition 3 = helping-behavior study (Kunda & Schwartz, 1983); Condition 4 = attitudes-toward-the-disabled study (Sigall & Page, 1972); Condition 5 = attraction study (Jones & Wein, 1972); Condition 6 = attitude-shift study (Gaes et al., 1978).

^aCondition 5 was omitted from this analysis because of a coding error that led to losing the data corresponding to this item.

participants in the attitudes-toward-disabled ($M = 3.77$), attraction ($M = 3.60$), and attitude-shifts ($M = 4.10$) studies. Second, the condition also affected the amount of distress perceived from the studies, $F(5, 173) = 3.789, p < .01$. More specifically, the smoking-habits study ($M = 4.97$) was believed to cause more distress than the attraction study ($M = 3.60$). Third, although the condition affected the level of perceived embarrassment, Scheffé tests did not show differences across conditions. Finally, it was believed that participants would be slightly embarrassed, annoyed, and distressed after they learned that the experimenter had deceived them, regardless of the condition.

Hypothesis 3c predicted that participants would be perceived as unlikely to report to the experimenter if they were embarrassed, annoyed, or distressed after being told the true purpose of the study and that they had been deceived by the researcher. Overall, it was believed that only a few participants would report these negative feelings to the researcher, regardless of the research condition. Thus, Hypothesis 3c was partially supported.

Finally, we examined perceptions of the willingness of participants to volunteer for studies after discovering their exact nature. Results indicate that it was believed that participants would be somewhat less willing to participate in research if they knew that it would involve deception ($M = 3.29$), being hooked to a lie detector ($M = 2.91$), or embarrassment ($M = 2.29$). These results were consistent across conditions and, therefore, support Hypothesis 3d.

Costs Versus Benefits

Cost–benefit analyses revealed that participants believed that the benefits to scientific knowledge and to society of the studies using the BPL somewhat outweighed the costs incurred by participants. Regarding the research question, though, results of the Scheffé test indicate that there were no differences across conditions, $F(5, 172) = 2.421, p < .05$. Moreover, based on their cost–benefit analysis, 72% of the participants believed that studies using the BPL should be conducted, regardless of the condition, $\chi^2(5, N = 167) = 2.910, p = .714$. Thus, these results support Hypotheses 4a and 4b.

Impact of Condition

As described in the preceding sections, exploratory analyses showed that the nature of the research using the BPL affected some of the participants' responses. Table 3 shows the significant one-way ANOVAs and the mean differences between the conditions that differentially influenced the dependent variables. As noted in Table 3, most differences involved the cigarette-smoking study that used children. Thus, we replicated all of the ANOVAs after removing the study examining cigarette smoking in children. Results show that only one of the dependent variables differed based on condition (i.e., participants in the racial-attitudes study were perceived as more annoyed about being deceived than were those in the attraction study). This statistically significant F finding could be explained by chance alone because only 1 of the 19 ANOVAs conducted was statistically significant at an alpha level of .05. In conclusion, only the study using the BPL on children, and only on a limited set of dependent variables (Table 3), was perceived as being different from the other studies regarding ethical issues.

Discussion

The goal of the present study was to gather empirical information regarding the ethics of using the BPL. Although the BPL has been used extensively across several areas of social psychological research, there has been only speculation about it being unethical (e.g., Ostrom, 1973), with no empirical research to support

this claim. Moreover, following a recommendation regarding ethical issues in social psychology in general (e.g., Gergen, 1973; West & Gunn, 1978), recent debates on the ethics of using the BPL concluded with the recommendation that empirical research be conducted to inform the debate (Aguinis & Handelsman, 1997b). Although empirical research might not be a substitute for value-based decisions, from a utilitarian perspective (Aguinis & Handelsman, 1997b) data may provide useful information and complement belief-based recommendations (Gergen, 1973; Sieber, 1983; Vinacke, 1954; Wilson & Donnerstein, 1976).

The present study used undergraduate students, who comprise the population most often exposed to the BPL, to determine how they perceive the BPL and its potential effects. This is valuable information because it has been shown that researchers often believe that deception is more unethical than do participants (Sullivan & Deiker, 1973) and because participants do not seem to be as concerned about the ethics of deception in research as psychologists think they are (Wilson & Donnerstein, 1976).

Overall, the results suggest that potential participants in BPL studies perceive the BPL as a useful and ethical research method. Participants believe that the research topics and results of BPL studies are important and that the BPL is an effective and believable research technique. Further, using the BPL is perceived as important, even when other nondeceptive methods (e.g., questionnaires) are available. Therefore, the BPL is perceived as a valid and important method for gathering data.

These results challenge the assertions that the BPL has dire consequences on participants (Aguinis & Handelsman, 1997a; Ostrom, 1973). Although the results show that it is believed that participants might experience some unpleasant emotions, they also show that participants believe that the studies should be conducted and that their benefits outweigh these slight inconveniences. Moreover, the results indicate that it is perceived that most participants in BPL studies would not be distrustful of the experimenter, which refutes another common criticism of deceptive research in general and the BPL in particular (Aguinis & Handelsman, 1997a, 1997b; Ostrom, 1973).

An additional noteworthy finding is that the perceived importance, effectiveness, and benefits of the BPL are generalizable across research areas as long as children are not the participants being exposed to the BPL. Therefore, not only can the BPL produce more valid information than can self-report measurement instruments (Aguinis et al., 1993; Roesse & Jamieson, 1993) but, from a data-driven utilitarian perspective, it can also be applied without much concern to many different research topics. However, we offer the caveat that using the BPL with children is perceived as ethically challenging. Moreover, we do not believe that final decisions regarding the ethics of the BPL should be based only on empirical research, as we do not believe that these decisions should be based only on personal values and principles. In our view, the present results complement

and inform the previous debates that focused mainly on deontological issues (e.g., Ostrom, 1973; Sigall, 1997).

Finally, we acknowledge that it is conceivable that participants might have responded differently had they actually participated in a study using the BPL. However, we do not see this as a major threat to the results and conclusions of this study. First, a pilot study was conducted to ensure that the BPL and how it is used were accurately described to help participants visualize what it would be like to be an actual subject. Second, now that we have evidence regarding the absence of perceived negative effects, future research can be conducted actually using the BPL with study participants. Several authors have warned about the potential dangers of using the BPL (e.g., Ostrom, 1973). Thus, it would have been unethical for us to directly expose study participants to the BPL, given the possibility that the procedure might have been harmful (Aguinis & Handelsman, 1997a; Ostrom, 1973). Instead, our approach was first to gather data regarding perceptions of potential participants without actually exposing them to the BPL. Given the present results, we now encourage future research that actually exposes participants to the BPL.

In conclusion, the BPL is a useful research tool for discovering information about human behavior and attitudes that might otherwise be unattainable. Arguments based on personal convictions and values have led to the conclusion that the method might be unethical (cf. Aguinis & Handelsman, 1997a). As this study has shown empirically, potential participants do not perceive the method as unethical or severely harmful. These empirical results can now be used by IRBs, funding agencies, and other policymakers to complement previous value-based debates regarding the ethics of the BPL. We hope that the combination of value-based and empirical-based perspectives will lead to the design of more informed guidelines regarding the use of the BPL in social psychological research.

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