An Experiment in Contingent Valuation and Social Desirability

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Social desirability (SD) represents the problem of subjects responding with social norms rather than individual values. This paper briefly surveys the SD literature and considers its relevance for contingent valuation (CV) studies. In an empirical study, undergraduate students were administered the Marlowe-Crowne Social Desirability Scale, as well as CV questions. High SD scores were hypothesized to imply a greater likelihood of offering a protest reason for a zero bid and to increase bids for socially desirable commodities. While all hypotheses were not supported, the empirical results suggest that SD can influence CV responses and should not be dismissed prematurely.

The possibility that responses to contingent valuation (CV) questions represent a reaction to the survey process rather than truly held values for the commodity in question has been raised in several evaluations of CV (Fischoff and Furby; Mitchell and Carson). Some of these reactions may be the result of the respondent's desire to give a socially acceptable response. If a respondent's stated willingness to pay is primarily the result of a desire to convey a good impression, it is without economic meaning for benefit-cost analysis. Thus, this issue deserves some empirical evaluation.

Social psychologists use the term "social desirability" to express the concept of individuals tailoring their survey responses to be consistent with the perceived social norm (DeMaio). Mitchell and Carson discuss social desirability briefly as an aspect of "compliance bias" (p. 238–239). They recount an anecdote in which the respondent wanted reassurance that her answers were "normal" responses, but offer no citations directly testing the relationship between social desirability and CV. Nevertheless, they conclude that social desirability issues are unimportant for CV studies with a quote from DeMaio's review article, ". . . perhaps the problem is not as overwhelming as it appears to be." In the context of the article, DeMaio did not mean to completely dismiss the effects of social desirability. The complete sentence reads

"However, to the extent that our actions as well as our responses to survey questions are influenced by what we see as socially desirable, perhaps the problem is not as overwhelming as it appears to be," (DeMaio, p. 279). The complete quote suggests that social desirability may influence survey responses more than it influences market values. If so, socially desirable responses represent a problem for CV. To dismiss the relevance of social desirability to the relationship between stated values and actual values by assuming the relationship is already proven is premature.

This paper presents an assessment of the relationship between socially desirable responses and CV. The psychological literature on social desirability is reviewed from the perspective of its effect on stated willingness to pay. A rudimentary theoretical analysis is developed to derive some hypotheses on the effect of social desirability on CV responses. An experimental study with students is used to test the hypotheses.

Social Desirability and Contingent Valuation

Like many theoretical constructs, social desirability is a concept which has been characterized in many ways but never defined precisely. DeMaio (p. 257) suggests social desirability is "a tendency to give a favorable picture of oneself." Phillips and Clancy (p. 923) state that social desirability bias "refers to a tendency of people to deny socially undesirable traits or qualities and to admit to socially desirable ones." Paulhus (p. 17) suggests social desirability is "the tendency to give answers

that make the respondent look good.'' These descriptions express the concept that social desirability is concerned with the idea that people want to present themselves in a positive way in reference to social norms. Phillips and Clancy suggest the general rubric of social desirability has two aspects, ''trait desirability'' and ''need for social approval.'' Trait desirability refers to possessing a desirable trait (many friends, concern about the environment) which influences responses to survey questions. In CV terms, a respondent who knows it is fashionable to be concerned about preserving rain forests would give a positive value for preservation just to appear to be concerned. Many CV questions concerned with public goods have trait desirability characteristics. The ''need for social approval'' refers to giving the culturally preferred response. This is a characteristic of the person related to their desire to appear to be ''normal.'' More recent work suggests the motivation may be ''avoidance of disapproval'' (Paulhus).

As DeMaio pointed out in the earlier quotation, social desirability is both a motivating factor for real behavior *and* a source of bias in self-reported survey items. Results from factor analysis of social desirability instruments summarized by Paulhus may help explain the distinction. Factor analysis on social desirability scales reveals two factors. Paulhus labels one ''self-deceptive positivity'' (an honest but overly positive self-presentation). The other is termed ''impression management'' (self-presentation tailored to an audience). Several studies have found that controlling for self-deception reduces the predictive validity of related personality measures. Self-deception is ''inextricably linked to content variance and should not be controlled'' (Paulhus, p. 23). Impression management, on the other hand, should be controlled when it is independent of the issue being assessed but still plays a role in the self-report on the issue.

Adapting this distinction to CV, true willingness to pay, *WTP,* may be considered a function of the self-deception component of social desirability, SD_1, and other characteristics of the respondent, X_1:

$$(1) \qquad WTP = g(SD_1, X_1)$$

However, stated willingness to pay, SWTP, is a function of the impression management component of social desirability, SD_2, characteristics of the respondent and the test situation, X_2, and the true willingness to pay:

$$(2) \qquad SWTP = f[SD_2, X_2, g(SD_1, X_1)]$$

Mitchell and Carson imply that SD_1 is relatively more important than SD_2. They recognize the self-deception factor and dismiss the impression management factor. So, they contend socially desirable responding is not a measurement problem but merely another characteristic of the individual which influences their behavior and their responses to CV questions. Self-deception would presumably also influence actual market behavior. While this view of SD_1 is correct, SD_2 can also be important, and impression management is a threat to the validity of contingent values. If stated willingness to pay is largely influenced by the respondent's desire to leave a good impression, it is devoid of economic meaning for benefit-cost analysis.

Contingent valuation questions often have social desirability content. Compliance bias, interviewer bias, starting point bias, and embedding bias are well known in the contingent valuation survey design literature and survey guides discuss minimizing their effects. Social desirability is one possible explanation for all these biases. Interviewer bias (Boyle and Bishop) can be viewed as a result of different interviewers who seem to hold differing social norms. Anchoring on dichotomous bid amounts and starting point bias in iterative bidding games (Laughland, Musser, and Musser; Boyle, Bishop, and Welsch) may represent the respondent's use of the given amount to establish a socially acceptable range. Embedding effects (Kahneman and Knetsch; Smith) may represent a form of social entrapment as respondents must offer more for each additional service or appear inconsistent. These alternative interpretations of well known biases suggest that a measurable relationship between willingness to pay and social desirability may be present in some CV studies.

The social psychology literature indicates that respondents with high or low needs for social approval will tend to behave differently than others (DeMaio). In theory, an individual with a high need for social approval will strive to meet the social norm more assiduously than an individual with a low need for social approval. If the survey situation does not provide cues to the social norm, the respondent with a high need for social approval will be expected to state a high willingness to pay to ensure that they meet or exceed the social norm. The basic hypothesis tested in the experiment reported here is that a respondent with a high need for social approval will give higher willingness to pay values for socially desirable goods.

Need for social approval may also influence the way respondents refuse to answer questions. CV surveys typically present a respondent who states a zero willingness to pay with a list of possible rea-

sons for stating a zero value and ask them to select one. The responses are used in the analysis to separate "true" zero values from "protest" zero responses (Desvousges, Smith, and Fisher). Halstead, Luloff, and Stevens found discriminant analysis was unable to differentiate protesters from non-protesters based on demographic and experience variables. Whatever their real reason for offering a zero value, a respondent with high need for social approval will, theoretically, wish to give a socially acceptable response to the follow-up question. Protesting the question may be more socially desirable than saying you do not value the good. For example, it is far more socially acceptable to say "Whales are priceless," than it is to say "I don't care if whales are hunted to extinction." Therefore, a second hypothesis is that need for social approval will be higher for zero protest responders than non-protest zero responders. Perhaps an indicator of need for social approval would have improved the predictive power of Halstead, Luloff, and Stevens' discriminant analysis.

Methods

Participants in this study were students at the Pennsylvania State University enrolled in two undergraduate agricultural economics classes in the Fall semester, 1991. After a short explanation, students were given a questionnaire that they anonymously completed in the classroom. A total of 170 questionnaires were returned. One was completely blank, and two were completed by graduate students. After these were deleted, the sample size was 167.

Face to face interviews provide a more socially demanding survey situation than the anonymous written questionnaire and therefore would be more prone to social desirability biases. However, many CV surveys use mailed written questionnaires similar to the instrument in this study. Lacking resources to test both survey techniques, the written questionnaire approach was taken to provide adequate sample sizes and mimic a common CV technique. If social desirability was found to have any effect in this least demanding of survey situations, it would certainly have an impact in more demanding situations.

All respondents were asked to value two goods, preservation of Mount Nittany and improved food safety for hamburgers. These commodities were chosen to be of interest to the students and to represent contrasting consumption characteristics. Pretest interviews were used to clarify the transaction descriptions.

Mount Nittany provides a natural backdrop and convenient recreation center for the Penn State community. Its preservation was assumed to have use, option, and existence values as well as being non-rival in consumption. The Mount Nittany question read:

> Mount Nittany has been described as 'the Mount Fuji of Happy Valley.' It provides the backdrop for all of our activities here and a pleasant place to hike and camp.
>
> Over the years there have been proposals to develop Mount Nittany in various ways. Several years ago an alumni association purchased the top of the mountain to ensure it would remain in its natural state. Assume this had not happened and Mount Nittany was now threatened with a housing development. Further, assume that the university is planning to raise student fees to buy the mountain so the view from Beaver Stadium will not be degraded.
>
> Would you be willing to pay a one-time charge of [Bid Amount] in additional student fees to preserve Mount Nittany in its present, natural state?
> Yes No
> What is the maximum additional one-time student fee you would be willing to pay to preserve Mount Nittany?

The food safety valuation was framed as an improvement in food handling resulting in a decreased risk of food poisoning at fast food restaurants. It was considered to have use value, in the sense of reducing risk of illness, and be rival in consumption. Food safety concerns are discussed in these classes. The food safety question read:

> Food poisoning can be caused by the presence of bacteria such as salmonella in raw beef. Bacteria can get into beef during food production or during food preparation. In small quantities bacteria are harmless, but in large quantities they can cause severe illness.
>
> It has been estimated that the number of food poisoning cases from bacterial contamination could be reduced by up to two-thirds through improved food management. This would require improved sanitation in food production and better handling of food in restaurants. These practices would be required by government regulations and enforced by government inspectors. The extra costs of such improvements would be passed on to the consumer in the form of increased prices.
>
> Would you be willing to pay [Bid Amount] extra for a quarter pound hamburger to greatly

reduce the chances of becoming ill from bacterial contamination?

Yes No

The average price for a quarter pound hamburger at a fast food restaurant in downtown State College is about $1.92. What would be the *maximum additional amount* you would be willing to pay to greatly reduce the chances of food poisoning?

The study had four treatment groups. Valuations were elicited with a dichotomous choice question followed by an open-ended question for half the sample; the other half was asked only the open-ended question. In addition, half the sample was given the food safety question first and half the Mount Nittany question first. Ranges of bid amounts for the dichotomous choice questions were selected after a pretest. The range of bid amounts for the Mount Nittany question was $5 to $205, and for the food safety question $0.03 to $1.28. Bid amounts were randomly assigned. Students were randomly assigned to the four conditions (i.e. Mount Nittany first, dichotomous and open-ended questions; Food safety first, dichotomous and open-ended questions; Mount Nittany first, open-ended only; Food safety first, open-ended only). This design allowed tests for order effects and for the impact of the dichotomous question on the open-ended valuation.

Questions on respondent characteristics, such as gender, major, age, class, and experiences related to the two commodities, were also included. Estimation of relevant budget constraints for students is always a problem. Kealy, Montgomery, and Dovidio found estimated discretionary income of students was unrelated to willingness to pay for a candy bar. Refining their procedure, a monthly discretionary expenditure was estimated through a series of questions on recent activities and spending patterns. A question such as "Did you go to the movies or rent videos [in the last week]?" was followed up with an expenditure question, such as "How much do you spend on entertainment [in a typical month]?" The question series clearly delineated the discretionary budget of students. Pretest interviews with a focus group supported the relevance of this measure for the food safety question. These interviews suggested that tuition and student fees, which are often paid by parents or financial aid, were evaluated differently than out-of-pocket expenses. Thus, the discretionary budget may not relate as well to the Mount Nittany question. However, estimation of total budget from all sources seemed likely to be subject to considerable error. In addition, the discretionary budget is likely

to be correlated with the actual budget constraint for the respondent's education and therefore serve as a proxy for an ideal income measure for the Mount Nittany question.

Finally, the questionnaire contained the Marlowe-Crowne Social Desirability Scale (Robinson and Shaver). This consists of 33 true-false questions each of which has a socially desirable and undesirable response. For example, one question reads "I like to gossip at times." A question is scored with a one whenever the respondent gives the socially desirable answer and zero for the other answer. The sum of the scores is an indicator of the respondent's need for social acceptance ranging from 0 to 33. Originally developed in 1960 by Crowne and Marlowe, the scale provides an independent reflection of the respondent's test-taking strategy. The scale is still widely used in behavioral research. Recent applications have been in attitudes toward AIDS (O'Brien) and work-related testing (Luthans).

Outliers and Protest Zeroes

Previous research has demonstrated that the results of CV studies are dependent on the exclusion of outliers and protest zeroes (Desvousges, Smith, and Fisher). Similar to previous studies, zero responses to the open-ended willingness to pay question were identified as protest or non-protest with a follow-up check-off question. Table 1 shows that the great majority of the sample did not protest. Fifteen protesters were identified for the Mount Nittany commodity. The modal response was "The government, or some other organization should do something about it," with seven respondents. The food safety question had 27 protest responses of which 23 said "Food should be safe without having to pay more." Only four respondents gave protest zero responses to both commodities. Most respondents offered a positive value for at least one of the commodities. Only 16 respondents answered zero to both commodities. Thus most students considered each commodity separately and did not dismiss the survey process entirely.

Valuations stated for the open-ended Mount Nit-

Table 1. Distribution of Zero Protest Responses

	Mount Nittany Protest	Non-Protest	Total
Food Safety			
Protest	4	23	27
Non-Protest	11	28	39
Total	15	51	66

tany question ranged from 0 to $8,000. Valuations for the open-ended food safety question ranged from 0 to $1.23. The upper ends of these ranges may indicate strategic bidding. However, the students who gave high values for one question did not offer high values for the other question so no subset of consistent strategic bidders was obvious. Nevertheless, three approaches to eliminating outliers were used to establish three subsets of data for each good.

The first approach utilized the RSTUDENT statistic which is calculated from a regression not including the observation. Define the standard estimated residual for observation i as r_i, s_i^2 as the variance estimate from this regression, and h_i as the ith diagonal element of the matrix, $h_i = x_i(X'X)^{-1}x_i'$. Then $RSTUDENT_i = r_i/(s_i(1-h_i)^{1/2})$. $RSTUDENT_i$ greater than 2 indicates the residual for observation i from the same regression on the same data set with observation i deleted is outside the 95% confidence limits for that regression (SAS, p. 676; Belsley, Kuh, and Welsch). The criteria that observations with RSTUDENT values greater than two are outliers, identified three outliers for the Mount Nittany question and ten for the food safety question. Not surprisingly, these were the bids over $1,000 for the Mount Nittany question and bids over $1.00 for the food safety question.

The second method deleted those observations with zero protest bids, in addition to those observations with RSTUDENT greater than two. This method identified 18 outliers for the Mount Nittany question and 34 for the food safety question.

The third data set was derived with the method outlined by Desvousges, Smith, and Fisher. After eliminating the observations with protest zero responses, those observations which were shown to change the value of the coefficient on the expenditure variable by more than 30% were deleted. This method eliminated 49 observations for the Mount Nittany question and 41 for the food safety question.

Results

Scores on the Marlowe-Crowne Social Desirability Scale ranged from 1 to 27 with a median of 14. The mean score for males was 14.5. For females, the mean score was 14.4. These mean scores are consistent with the ranges normally found for college undergraduates, 10.1–14.4 for males, 13.5–16.0 for females, and the general population, 14.0 (Robinson and Shaver).

Table 2 shows that among all respondents stat-

Table 2. Mean Social Desirability Score of Respondents Who Stated Zero Values for the Commodity

	Mean	Std Dev	N	t
Mount Nittany				
Protest Zero	13.36	3.12	15	
				1.00
Non-Protest Zero	14.59	3.95	21	
Food Safety				
Protest Zero	16.28	4.94	27	
				1.66*
Non-Protest Zero	13.87	4.71	19	

*Significant at the .05 level with a one-tailed t-test.

ing a zero value for the commodity those identified as protesters for the food safety question had higher social desirability scores than non-protesters. The null hypothesis that protesters have social desirability scores less than or equal to scores for non-protestors can be rejected at the .05 level of significance with a one-tailed t-test. However, those identified as protesters for the Mount Nittany question had insignificantly lower social desirability scores. Higher social desirability scores for protest responders would support the hypothesis that protest answers may be a socially acceptable deflection of socially unacceptable real feelings. The significant difference for the food safety question provides some support for the deflection hypothesis. The social norm for the group being surveyed may differ from that expected by the researchers. Conservative agriculture students may not interpret the zero protest responses, such as having the government preserve Mount Nittany, as a socially acceptable response. Those with a high need for social acceptance and a zero willingness to pay may not have been willing to protest for this good.

Simple correlations and t-tests failed to indicate any relation between social desirability and willingness to pay as elicited by the open-ended question. Multiple regression models therefore were used to control some of the factors that may influence willingness to pay. For each subsample defined by deleting outliers (and zero protest bids), the maximum willingness to pay for each commodity was regressed on the variables defined in Table 3. All of the subsamples had regressions significant at the five percent level for the Mount Nittany good, as shown in Table 4. Only the second subsample regression for the food safety good was significant at the five percent level, as shown in Table 5.

Several results were common to all three subsamples for the Mount Nittany good. The coeffi-

Table 3.   Definition of Regression Variables

Name	Expected Sign	Description
MOSPEND	+	The monthly expenditure calculated from the set of budget items described above.
—BID	+	The bid amount offered for the particular good if one was asked.
BIDDUM	?	A dummy variable indicating whether the dichotomous question was asked (1) or not (0).
FOODFRST	+/−	A dummy variable indicating whether the food safety question was asked first (1) or second (0). Expected to be positive for the food question and negative for the Mount Nittany question.
—INT	?	A dummy variable indicating whether the respondent's major was related to the commodity. Food Science was considered related to the food safety question, for instance.
SDSCORE	+	Social desirability score from the Marlowe-Crowne Social Desirability Scale. Values are from 1 to 33.
CLASSDUM	?	A dummy variable indicating which of the two under-graduate classes surveyed the respondent attended. Ag Ec 460 (1) is an advanced agricultural economics course. Ag Ec 101 (0) is an introductory agricultural economics course required for many majors in the College of Agriculture.
Experience Variables	+	Dummies for yes-no questions assessing the respondent's familiarity with the commodity or likely propensity to value it. Persons who had suffered food poisoning, for instance, were expected to value food safety more highly.

Table 4.   Open-ended Maximum Willingness to Pay Regression Results for the Preservation of Mount Nittany

Subsample:	1	2	3
Constant	114.68*	123.23*	50.66
	(63.73)	(67.53)	(53.66)
MOSPEND	−0.08	−0.06	0.16
	(0.19)	(0.20)	(0.20)
NITBID	0.61*	0.62*	0.63**
	(0.34)	(0.37)	(0.23)
BIDDUM	−107.78**	−115.61**	−102.92**
	(43.08)	(46.16)	(29.90)
FOODFRST	−39.86	−33.81	−43.95**
	(28.08)	(30.11)	(21.06)
NITINT	44.34	57.81	0.07
	(40.80)	(44.40)	(29.36)
SDSCORE	0.67	0.28	2.76
	(2.80)	(2.91)	(2.18)
CLASSDUM	−44.83	−51.26	−50.01*
	(33.05)	(35.63)	(26.61)
Experience Variables			
Hiked on Mt. Nittany	27.24	36.74	−5.07
	(32.09)	(34.12)	(24.37)
Goes to Football Games	44.85	47.49	58.92**
	(33.27)	(36.19)	(25.25)
R^2	0.11	0.13	0.24
F	2.06**	2.10**	3.45**
n	154	140	109

Standard Errors in parentheses.
*Signifiant at the 0.10 level; **Significant at the 0.05 level.

cients on social desirability score were positive but not significant. The presence of a bid and the bid amount influenced respondents' stated willingness to pay. Average responses for those without a bid amount were over $100 more than those who had a bid amount. Thirteen respondents who were asked only the open-ended question offered values over $300. Only one respondent who was asked a dichotomous question offered a value over $300. Social desirability may explain this result. Respondents may have taken the bid amount as a socially acceptable benchmark. Those who did not have a bid amount benchmark offered excessive amounts to ensure they did not appear ungenerous.

For the food safety commodity, only the regression using subsample 2 was significant. Question order, class, social desirability score and refusal to eat in unclean restaurants were significant variables. Unlike the Mount Nittany question, respondents did not cue on the bid amount. This result also is consistent with a social desirability theoretical framework. The students already knew the appropriate range for hamburger prices; most regularly purchase hamburgers and the question also stated the average price for a quarter pound hamburger in the area. The dichotomous choice bid amount was therefore superfluous.

Conclusion

This study found some limited initial evidence of a relation between the need for social acceptance and contingent valuation for a food safety question. Social desirability scores were significantly related to zero protest responses, and to the maximum willingness to pay in one out of three regression

Table 5. Open-ended Maximum Willingness to Pay Regression Results for Food Safety

Subsample:	1	2	3
Constant	0.051	−0.068	0.041
	(0.091)	(0.106)	(0.135)
MOSPEND	0.0002	0.0005	0.0006
	(0.0003)	(0.0003)	(0.0004)
FOODBID	−0.016	0.015	−0.052
	(0.074)	(0.086)	(0.100)
BIDDUM	0.074	0.067	0.180
	(0.189)	(0.222)	(0.261)
FOODFRST	0.086**	0.086**	0.041
	(0.037)	(0.043)	(0.050)
FOODINT	−0.045	−0.062	−0.033
	(0.044)	(0.052)	(0.059)
SDSCORE	0.003	0.009**	0.005
	(0.004)	(0.004)	(0.005)
CLASSDUM	0.034	0.102*	0.046
	(0.045)	(0.052)	(0.062)
Experience Variables			
Concerned about	−0.025	−0.056	−0.026
cleanliness	(0.056)	(0.065)	(0.074)
Refused due to	0.060	0.101**	0.051
cleanliness	(0.043)	(0.050)	(0.058)
Suffered food	0.004	0.044	−0.017
poisoning	(0.058)	(0.066)	(0.076)
R^2	0.08	0.20	0.06
F	1.22	2.92**	0.68
n	148	127	120

Standard Errors in parentheses.
*Significant at the 0.10 level; **Significant at the 0.05 level.

models. However, no direct evidence of the impact of this process was found for a preservation of Mount Nittany question, which was a resource issue. These statistical results are not as convincing as most econometric studies. However, previous CV studies often include similar results. The classic analysis of recreational boating demand in east Texas by Seller, Stoll, and Chavas relied on bid curves with R^2 which range from .06 to .14. They derive compensated demand curves using coefficients significant only at the .10 level. Desvousges, Smith, and Fisher include two insignificant regressions among five reported in their study of the Monongahela River. Halstead, Luloff, and Stevens (1992) draw their conclusions from discriminant and logit analyses with very poor predictive ability. Thus, this paper is not unique in this respect.

These commodities were chosen because student participants would be familiar with them and presumably be able to complete CV questions about them. Neither commodity had significant trait desirability, which would make social desirability a more significant problem (Phillips and Clancy). Preservation of farmland, clean water, or a popular wildlife species are all examples of com-

modities which a priori seem to be more socially desirable. For this study, it is plausible that food safety was more socially acceptable than preservation of Mount Nittany. The participants were agricultural students who presumably would be interested in food quality including safety. However, they may not perceive preservation of natural environments as positively. They may relate "preservation" to environmental controls that are commonly considered restrictions on farming amongst such students. The modal zero protest response of involving the government in land preservation again may not be socially desirable for a conservative group of students. Thus, the pattern of results are consistent with social desirability of the commodities *for these respondents*.

The anonymous written questionnaire format in this study also provides less incentive to act in a socially desirable way when compared to face-to-face interviews, telephone interviews, or identifiable questionnaires (Paulhus). Thus, one would expect more of an effect with other survey methods. Limited resources precluded evaluation of these other methods. However, the survey method used in this study is used in many CV studies so the potential effects here are relevant for most CV analysis.

Recognition of the social desirability problem could contribute to understanding many of the most controversial issues in CV research today. The anchoring of open-ended CV responses on dichotomous choice bids for the Mount Nittany question but not the food safety question is an example of potential effects of social desirability. Understanding the problem may lead to better methods to cope with embedding, bid anchoring, and benefits transfer. Research with non-linear relationships between social desirability and willingness to pay, alternative measures of social desirability, more socially demanding survey techniques, and more universally socially desirable commodities may be able to elucidate the interrelationship between social desirability and contingent valuation. In addition, further research on dichotomous choice methods is warranted. The limited support for the impact of social desirability on CV in this study suggests that it is premature to dismiss its impact, especially in other situations where it is more likely to have an effect.

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