# The Role of Conditioning Information in Reports of Subjective Phenomena

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## Abstract

Reports of subjective phenomena are inherently subject to some uncertainty on the part of the respondent. The existence of uncertainty is obvious when the reports are of subjective expectations about prospective outcomes. In other cases, it is not so clear. Sometimes respondents are asked to make hypothetical choices, in which case uncertainty remains unless all relevant elements of the hypothetical scenario are specified. More generally, whenever concepts are loosely defined, be they prospective outcomes, hypothetical scenarios, or other relevant aspects of the question, uncertainty about the appropriate response will remain.

This paper considers the interaction between this uncertainty and the text and context of the survey question. Three types of questions are discussed -- questions eliciting unconditional expectations, conditional expectations, and hypothetical choices. In each case, it is difficult to convey to respondents the types of information on which they should and should not condition. When respondents use information in a way that differs from the researcher's assumptions, the researcher may infer that respondents are deficient in some way (e.g., do not provide coherent probability assessments or do not have consistent preference orderings).

## 1. Introduction

Reports of subjective phenomena are inherently subject to some uncertainty on the part of the respondent. The existence of uncertainty is obvious when the reports are of subjective expectations about prospective outcomes. In other cases, it is not so clear. Sometimes respondents are asked to make hypothetical choices, in which case uncertainty remains unless all relevant elements of the hypothetical scenario are specified. More generally, whenever concepts are loosely defined, be they prospective outcomes, hypothetical scenarios, or other relevant aspects of the question, uncertainty about the appropriate response will remain.

This paper considers the interaction between this uncertainty and the text and context of the survey question. Particular attention is paid to examples in which researchers may infer that respondents are deficient in some way (e.g., do not provide coherent probability assessments or do not have consistent preference orderings), but the apparent deficiency may be attributed instead to information inferred from the question text and context.

A classic example of such an inference may be found in the work of Kahneman and Tversky on the apparent tendency of survey respondents to ignore prior probabilities or "base rates" when reporting posterior probabilities after being given information in an experimental setting (see, for example, chapters 4 and 10 in Kahneman, Slovic, and Tversky, 1982). In one study,

> "Subjects were shown brief personality descriptions of several individuals, allegedly sampled at random from a group of 100 professionals — engineers and lawyers. The subjects were asked to assess, for each description, the probability that it belonged to an engineer rather than to a lawyer." (Tversky and Kahneman, 1982, p.5)

One group of respondents was told that the description was drawn from a sample of descriptions of 70 lawyers and 30 engineers, whereas the other group was told that the sample consisted of 30 lawyers and 70 engineers. The two groups reported similar probabilities when shown the descriptions, even when this neutral description was given:

> Dick is a 30 year old man. He is married with no children. A man of high ability and high motivation, he promises to be quite successful in his field. He is well liked by his colleagues.

Only in response to the following statement did respondents appear sensitive to the prior probabilities:

> Suppose now that you are given no information whatsoever about an individual chosen at random from the sample. The probability that this man is one of the 30 (70) engineers in the sample of 100 is ___%.

These findings led to the following conclusion:

> "When no specific evidence is given, prior probabilities are properly utilized; when worthless

evidence is given, prior probabilities are ignored." (Tversky and Kahneman, 1982, p. 5)

The two questions, however, are fundamentally different, suggesting that stark differences in response behavior may not be so disconcerting. The first question elicits the probability that the described individual is an engineer. As has been noted elsewhere (e.g., Grether, 1980), only if they believe that Dick's description was actually randomly drawn from a sample of 30 (70) engineers and 70 (30) lawyers should Bayesian respondents' reported probabilities be sensitive to the stated base rate. In contrast, the second question elicits the probability that a hypothetical draw from a such a sample would be an engineer.

This example illustrates how respondents may condition responses on different information than researchers assume when interpreting these responses. In this case, the researchers assume that respondents used only (and believed all of) the information provided in the experiment and therefore infer that respondents did not properly use this information. The respondents, however, may have (correctly) inferred that the descriptions were not actually randomly drawn and therefore conditioned responses on some other priors.

In our work eliciting expectations in the form of subjective probabilities, Chuck Manski and I have repeatedly faced the task of posing questions in which we hope respondents will either condition or not condition on certain types of information. For example, we asked students to report unconditional expectations of earnings at age 30, as well as expectations conditional on obtaining either a high school diploma only or at least a college diploma (Dominitz and Manski, 1996). In each case, we wanted respondents to consider the probability of not working at all or only working part-time, but evidence suggests that some respondents actually conditioned on working full-time. In the case of earnings conditional on a specified level of schooling, we wanted respondents to not condition on having chosen that level but rather to condition on having been exogenously assigned to that level. Our success at inducing such responses is rather difficult to ascertain.

This paper presents examples from our own surveys and others that illustrate the difficulty of posing questions and interpreting responses when not all the desired (or not desired) conditioning information can be made explicit. Respondents are therefore left to resolve some of the uncertainty and they may do so in a way that differs from that assumed by the researcher. Three types of questions are discussed. Section 2 describes questions eliciting unconditional expectations, while conditional expectations questions are discussed in Section 3. In both cases, responses are given in the form of subjective probabilities. Section 4 considers a different type of conditional expectations question, one that elicits hypothetical choices rather than hypothetical-choice

probabilities. In this case, uncertainty exists about both the proper conditioning information and the proper interpretation of the question. Conclusions are given in Section 5. The appendix contains extended excerpts of the survey questions of interest.

## 2. Eliciting Unconditional Expectations

### 2.1. Madison Study of Student Expectations

Consider the way that we elicited students' expectations of earnings at age 30 (Dominitz and Manski, 1996). The questions were prefaced by the following instructions:

> And please keep in mind the chance that you will not work for pay, or will only work some of the time, when you are 30...
>
> Look ahead to when you will be 30 years old. Think about the kinds of jobs that will be available for you and that you will accept.

The first instruction was intended to keep respondents from conditioning on working full-time at age 30. Discussions with respondents, however, suggest that we were not completely successful. This problem is most clear when analyzing females' reported perceptions of the current earnings of 30-year-old women, which tend to greatly exceed unconditional earnings but not the earnings of women who work "full-time, year-round" (see Dominitz and Manski, 1996). In contrast, the male students' perceptions of the current earnings of 30-year-old men tend to match up more closely to the actual earnings, perhaps because most 30-year-old men actually work full-time. Without recognizing the role of the conditioning information, we would infer that female respondents overestimate earnings but males do not.

It is also worth noting the second instruction above, which was intended to precisely define the subjective earnings distribution in which we were interested. That is, we wanted respondents to consider only earnings on jobs that they would accept. In a simple labor economic model, that would be the wage offer distribution truncated at the reservation wage, rather than the entire wage offer distribution, with the probability of not working (i.e., not receiving an acceptable wage offer) superimposed.

In designing such a survey, we spent much time considering both the difficulty of the cognitive task facing respondents and the usefulness of responses. We considered, for example, the possibility that conditional (on

full-time work) earnings expectations would be easier to report than unconditional, but for our purposes unconditional expectations were required. We could have elicited both the conditional earnings expectations and the probabilities of the conditioning events (e.g., working full-time, working part-time, not working), and then used the law of total probability to calculate unconditional expectations. This approach, however, would increase the number of questions and would require definition of each of the events.

## 2.2. Survey of Economic Expectations: Late-1995, Mid-1996 Experimental Module

Our experience with the student survey made us increasingly wary of assuming that respondents condition on only the intended information set. We noticed cases where respondents may reasonably infer relevant conditioning information from the text of the question, whether or not such conditioning is desired. For example, the 1992 Health and Retirement Study (HRS) asked the following questions:

> What do you think are the chances that you will be working full-time after you reach age 65?
>
> What about the chances that your health will limit your work activity during the next 10 years?

Should the respondent condition on living to reach age 65? On living for the next 10 years?

In an experimental module on the continuing Survey of Economic Expectations (SEE), we asked 50-64 year-old respondents a series of questions about behavior at age 66 and then concluded by asking:

> 512) What do you think is the percent chance that you will live to be 66 years old or more?
>
> and, if the response was "90" or less:
>
> 513) Please think about how you answered those questions about things that might happen when you turn 66 years old. Were you taking into account the [fill 512] percent chance that you would be alive at age 66, or were you responding under the assumption that you would be alive at age 66?

Of the 154 individuals asked the second question, 132 reported conditioning on being alive at age 66, 13 reported taking the probability of not being alive into account, and 9 reported "don't know" or some other response.

## 2.3. Monotonicity of the Subjective Cumulative Distribution Function

When eliciting probabilistic expectations of a prospective realization that may take on one of many values, such as earnings or income, it may be desirable to elicit a sequence of points on the respondent's subjective cumulative distribution function (CDF). We have adopted this approach in the Madison Study and the SEE

(income expectations). Questions on the HRS and the 1994 Panel Study of Income Dynamics (PSID) do so to elicit retirement, survival, and bequest expectations. The National Education Longitudinal Study (NELS) elicits expectations of educational attainment in this manner. When a sequence of responses violates montonicity of the CDF, it is tempting to infer that responses are inconsistent. If, however, the sequence of questions induces respondents to report a sequence of conditional expectations, then no inconsistency exists.

Consider this Madison Study question, asked for a sequence of earnings thresholds Y:

> When you are 30 years old, what do you think is the percent chance that you will earn more than Y dollars per year?

One such sequence is: $10,000, $30,000, $50,000. Clearly, if unconditional probabilities are reported, responses are only logically consistent if they (weakly) decrease as the value Y increases. Suppose, however, that when answering the second question posed, the respondent conditions on earnings being greater than the first value of $10,000. This conditional probability need not be less than the probability of the conditioning event.

*The Madison Study and the SEE:*

The Madison Study of Student Expectations consists of eight sections, each of which elicits such a sequence of earnings expectations. Error screens inform the respondent (who sits at a computer terminal) if the second or third response is not logically consistent with an earlier response within that section (i.e., violates monotonicity). An error rate of 0.07 was found in the first section, and the rates tended to decrease as the survey continued (Dominitz and Manski, 1996).

We report in Dominitz and Manski (1997) on the violations of monotonicity in the 1993 SEE. In this survey, annual household income expectations were elicited in a similar manner, but with up to four threshold values. Of the 437 respondents whose expectations we analyze, only 22 report a sequence of values that violates monotonicity and need to be prompted for revision. We speculate that the low error rate may be attributed to training received in earlier sections on unemployment duration and weekly earnings expectations. Another 51 respondents violate monotonicity in one of these sections.

*The HRS and the PSID:*

We believe that error screens may help to clarify the expectations that are being elicited. Other survey designers have not adopted this approach and have not engaged in the systematic practice of enforcing

monotonicity. The HRS sequences, for example, only enforce monotonicity when a limit probability is given (e.g., a response of "0" to the earnings expectations question above).

Hurd and McGarry (1995) analyze responses to the two survival expectations question in the 1992 HRS, which take this form:

> What do you think are the chances that you will live to be 75 or more?
>
> And how about the chances that you will live to be 85 or more?

It does not seem unreasonable for a respondent, having just been asked the first question, to interpret the second question as: "Suppose you do live to be 75 or more, what are the chances that you will live to be 85 or more?" Consider the respondents who report less than a 1.0 probability of living to be 75. Hurd and McGarry find that just over three percent of these respondents report a higher probability of living to 85. They argue that these responses "cannot be explained except as cognition or response error." Note that the low figure does not limit the proportion of potential cases where respondents are reporting conditional probabilities, because such probabilities may also decrease.

I have also analyzed the subjective survival probabilities given by 7594 respondents to the 1994 PSID. I find 347 violations of monotonicity.

Now consider bequest expectations:

> What are the chances that you will leave an inheritance totalling $10,000 or more?
>
> What are the chances that you will leave an inheritance totalling $100,000 or more?

I have analyzed the reports given by respondents to the 1994 PSID. According to the codebook, respondents were only to be asked the second question if the first response was a 31 percent chance or more, but the available data indicate otherwise. Regardless, it appears that 2575 respondents reported a less than 100 percent chance of leaving at least $10,000 and subsequently reported the chance of leaving at least $100,000. I find just 48 violations of monotonicity.

*The NELS:*

It is clearly reasonable to assert that the above examples are actually logical response errors. After all, probability elicitation may be a difficult task for many respondents. Consider what appears to be a simpler task faced by eighth-grade respondents to the 1988 NELS. They were asked the following questions:

> How sure are you that you will graduate from high school? Very sure, probably will, probably won't, or very sure won't.

and

> How sure are you that you will go on for further education after you leave high school? Very sure, probably will, probably won't, or very sure won't.

Is the second question one of the conditional or unconditional likelihood of going on for further education? Apparently, the survey designers intended it to be unconditional, because those reporting "very sure won't" were not asked the second question (thereby enforcing monotonicity). However, of the 4048 reporting "probably will" or "probably won't" graduate from high school (i.e., the respondents at-risk of violating monotonicity), 895 reported a greater likelihood of going on for further education (see appendix table A1).

The survey designers appear to have responded to these inconsistencies by questioning whether the "further education" outcome was properly defined. After all, many vocational schools do not require that students be high school graduates, so the student could expect to go on for further education without graduating from high school. The 1990 questions were revised as follows:

> Think about how you see the future. What are the chances that..
> ...you will graduate from high school? Very high, high, about 50-50, low, or very low.
> ...you will go to college? Very high, high, about 50-50, low, very low.

The results are presented in appendix table A2. This time, 354 out of 4324 at-risk respondents violated monotonicity. Note also that monotonicity was not enforced for students reporting a "very low" chance of going to college.

**3. Eliciting Conditional Expectations**

We are often interested in eliciting conditional rather than unconditional expectations. For instance, the Madison Study was designed to obtain data on students' expectations of the returns to a college education, defined in this case as the difference between expected annual earnings assuming the student obtains a bachelor's degree and expected earnings assuming he or she does not attend college (Dominitz and Manski, 1996). We could have directly elicited expected returns, but we believed it would be easier for students to report conditional earnings expectations. Similarly, the 1993 SEE elicited one-year-ahead expectations of weekly earnings conditional on working for pay, as well as the probability of working for pay, rather than unconditional expectations (Dominitz, 1997).

The two surveys, however, call for respondents to report two very different kinds of conditional expectations. In particular, we did not want student respondents to state expected earnings conditional on having chosen the specified level of schooling, whereas we did want SEE respondents to state expected earnings conditional on having chosen to work for pay.

Consider the instructions given prior to asking the student earnings expectations questions.

> The next sets of questions ask you to put yourself in one of two hypothetical situations. In the first situation, you assume that you continue in school until you finish your senior year of HIGH SCHOOL and obtain your diploma, and you DO NOT continue in school after that. In the second hypothetical situation, you assume that you continue in school AT LEAST until you finish your senior year of college and obtain your COLLEGE DIPLOMA (a Bachelor's degree).
>
> When responding to these questions, please attempt to fully place yourself in the hypothetical situation as it is described....Just think about the kinds of jobs that would be available for you and that you would accept. Think about the amount of money you would make on these jobs...

Observe that the wording we use to describe the two schooling scenarios offers respondents no reason why one or the other scenario might be realized. This is intentional — we did not want respondents to draw from the descriptions of the scenarios information that might influence their expectations. It is these expectations that are thought to determine behavior in economic models of schooling choices. These data may therefore be used to estimate such a model. Were students to report subjective expectations conditional on having chosen the specified schooling level, these expectations would be subject to the same selection problem as are observed earnings distributions conditional on schooling levels.

The SEE earnings expectations questions were designed to assess the predictive value of the data. As such, we wanted to collect expectations of an outcome that is observed; that is, expectations of earnings conditional on having chosen to work. The employment and earnings questions were asked as follows:

> What do you think is the PERCENT CHANCE that you will be working for pay one year from now?
> (asked of all respondents)
>
> and, unless a response of “0" was given:
>
> ....Still thinking about your own earnings if you are working for pay one year from now.
> What do you think is the PERCENT CHANCE (or what are the chances out of 100) that your earnings, BEFORE DEDUCTIONS, will be less than $W per week ?
> (asked for a sequence of earnings thresholds W)

Our success at inducing respondents to use the desired conditioning information is rather difficult to ascertain. Discussions with student respondents suggest that they did try to place themselves in the hypothetical scenarios

without bringing in information as to why they may have obtained the specified level of schooling. The students, who reported high subjective probabilities of attending college, claimed to have not tried to figure out why they would not have continued on to college, but rather to have simply thought about the kinds of jobs they would have try to get if they only have a high school diploma. In the case of the SEE questions, earnings conditional on having chosen to work seems to be a much more understandable and familiar concept than earnings not having chosen to work, so respondents likely conditioned on this choice.

These two surveys ask respondents to place themselves into relatively comfortable hypothetical scenarios. High school students, facing the decision of whether or not to attend college, have likely thought about what kinds of jobs are available for individuals with different levels of educational attainment. SEE respondents who report a nonzero chance of working one year hence have likely thought about what types of jobs they might have at that time. For the purpose of estimating behavioral responses to changes in public policy, we have experimented with questions that ask respondents to report expectations conditional on less familiar hypothetical events.

The following series of questions asks 50-64 year-old SEE respondents to report age-66 full-time work expectations conditional on changes in the monthly premium charged for Medicare Part B:

> Politicians and the news media have been talking recently about changes in Medicare, the federal health insurance program for senior citizens. Currently, individuals 65 or older receive free insurance coverage, called Medicare Part A, which covers the cost of inpatient hospital care, home health care, hospice care, and some other services.
>
> In addition, these individuals may choose to purchase Medicare Part B, an insurance program which covers the costs of doctor's services, medical tests, and other health services not covered by Medicare Part A. The basic premium paid for Medicare Part B coverage is currently about $45 per month.
>
> Think ahead to when you are about to turn 66 years old. Suppose that Medicare premiums stay as they currently are (about $45 per month for Part B)...
> In this scenario, what do you think is the percent chance that you would choose to work full-time when you turn 66?
>
> Now, thinking ahead to when you are about to turn 66, suppose that Medicare Part B premiums have doubled, to $90 per month....
> In this scenario, what do you think is the percent chance (what are the chances out of 100) that you would choose to work full-time when you turn 66?

These probabilistic hypothetical-choice questions were answered by 252 out of 266 age-eligible SEE respondents in late-1995 and mid-1996. Of these respondents, 202 reported identical probabilities of working

full-time at age 66 under each scenario, 36 reported higher probabilities in response to higher premiums, and 14 reported lower probabilities. The mean full-time work probability increased from 0.26 to 0.28 in response to the doubling of premium.

The sign of the behavioral response also tended to be in line with economic intuition when we asked 18-49 year-old employed respondents to report the probability of leaving the current job during the next 12 months conditional on changes in the employer contribution to health insurance premiums. For example, in response to a decrease from a 100-percent contribution to no contribution at all, 279 out of 423 respondents reported a higher probability of leaving, whereas only 23 reported a lower probability.

More mixed results, however, were obtained in response to changes in national health insurance policy. For example, relative to the unconditional probability of leaving the job, the introduction of a hypothetical reform which increases portability induced 131 reports of higher probabilities of leaving the job, 181 reports of no change, and 90 reports of a lower probability, among respondents whose sole form of health insurance is employer-provided.

## 4. Eliciting Hypothetical Choices

To elicit hypothetical choices, survey designers typically do not elicit choice probabilities as we have done in the experimental SEE questions on behavioral responses to changes in health insurance premiums. The respondent is typically asked to report the choice he or she would make, rather than the probability of making this choice. If no uncertainty exists as to which choice would be made (i.e., the choice probability is either 0 or 1), then the distinction seems unimportant. If, however, some uncertainty remains, then attention needs to be paid to how respondents choose to answer the question.

This section presents two models of how a respondent may choose to answer a hypothetical-choice question when faced with multiple alternatives from which to choose. The first case is close to that labeled by Manski (1990) as "forced choice" responses when the respondent chooses between two alternatives. Hypothetical choices reported in this manner should satisfy axioms of revealed preference analysis if the respondent's actual choice behavior satisfies them. The second model, called "most likely choice," will yield hypothetical choices that may violate revealed preference axioms even if the respondent's actual choice behavior satisfies them.

4.1. Models of Response to Hypothetical Choice Questions

Consider a question that describes a hypothetical scenario and asks respondents to choose from among J alternatives. Associated with each alternative j is a level of (indirect) utility $U_j(w,z)$, where w represents information known about the alternatives at the time of the interview and z represents uncertainty that would be realized prior to actually making the choice were the respondent to be actually placed in the hypothetical situation and facing this choice. (For expository convenience, assume that all uncertainty about the utility of the alternatives would be resolved by that time). Let j* denote the selected alternative or "hypothetical choice."

*Forced Choice:*

Under this model, the respondent interprets the question as one asking him to report the alternative that maximizes expected utility given only the information known at the time of the interview. Let $V_j$ denote the expected utility of alternative j, such that $V_j = E[U_j(w,z) \mid w]$. It is clear that the hypothetical choice j* will be the alternative for which $V_{j*}$ exceeds $V_j$ for all other j.

Responses made in this way may be analyzed to assess the internal consistency of responses. In particular, consider cases in which a series of hypothetical choice questions are asked, where only the choice set varies (with overlap) across questions. Suppose, for instance, the respondent chooses alternative A over B and C. That means $V_A$ exceeds both $V_B$ and $V_C$. Then, when asked to choose from among alternatives A, B, C, and two additional alternatives (D and E), consistency requires that the respondent not choose B or C. In this hypothetical-choice sense, A is revealed preferred to both B and C.

*Most Likely Choice:*

Suppose now that the respondent does not interpret the question as eliciting the choice that maximizes expected utility given only the information currently available. Suppose instead that the respondent reports the hypothetical choice j* that he would be most likely to pick should he actually be faced with this choice; that is, the alternative which is most likely to maximize utility once the uncertainty z has been resolved.

In this case, the hypothetical choice j* is the one for which:

$$\Pr[\, U_{j*}(w,z) \geq U_j(w,z) \text{ for all } j \mid w] \geq \Pr[\, U_k(w,z) \geq U_j(w,z) \text{ for all } j \mid w] \quad \text{for all } k, \quad k, j = 1,2,...,J.$$

Should the individual respond in this way, then revealed preference arguments need not hold. In particular,

note how variation in choice sets may matter. Consider again the example where A is chosen over B and C. Thus,

$$\Pr[\, U_A(w,z) \geq U_B(w,z),\, U_A(w,z) \geq U_C(w,z) \mid w] \;\geq\; \Pr[\, U_B(w,z) \geq U_A(w,z),\, U_B(w,z) \geq U_C(w,z) \mid w]$$

and

$$\Pr[\, U_A(w,z) \geq U_B(w,z),\, U_A(w,z) \geq U_C(w,z) \mid w] \;\geq\; \Pr[\, U_C(w,z) \geq U_A(w,z),\, U_C(w,z) \geq U_B(w,z) \mid w]$$

Now, suppose the two additional alternatives (D and E) are introduced. Then, unless we place restrictions on these choice probabilities, a utility-maximizing respondent with well-behaved preferences may logically choose B or C (over A, D, and E). If, however, we assume that these choice probabilities satisfy the independence of irrelevant alternatives axiom defined in McFadden (1973), then choices B and C can be ruled out.

## 4.2. The Health and Retirement Study

Consider responses to the HRS questions that elicit preferences over various consumption expenditure streams, studied by Barsky et al. (1997) and reprinted in the appendix. The initial choice is from among three alternatives — A, C, and E — with decreasing, constant, and increasing expenditures, respectively. The second question adds two alternatives — B (moderately decreasing) and D (moderately increasing). These questions were designed to elicit information about individuals' subjective rates of time preference.

The introduction to these questions describes the hypothetical scenario as follows:

> Now I have a few questions about your preferences for spending and saving as you get older. To make the questions comparable for all respondents in the survey, let's suppose that you are now 50 years old, that you [and your (husband/wife)] will live to be 80. Further suppose that future health care costs are fully covered by insurance, that there will be no inflation, and that income after taxes is guaranteed to be $3000 each month from age 50 to age 80.

Note how the text is intended to resolve uncertainty, but some must remain. In particular, it is specified that health care costs are "fully covered by insurance." Were this conditioning information not to be made explicit, individuals may be induced to choose expenditure streams with increasing profiles as a form of precautionary saving to insure against large health care expenses late in life. Thus, risk preferences and health risks would affect choices, making inferences on time preference more difficult. However, the question does not specify whether or not health insurance premiums will increase. Even though respondents are told that "there will be no inflation," historical evidence suggests that health care costs rise faster than the general rate of inflation. In addition, the expected age-premium profile is sensitive to expectations about future Medicare policy and individual health risks. One may suspect, therefore, that prospective health care costs will induce individuals

to prefer increasing expenditure profiles. Barsky et al. find that respondents tend to prefer an upward sloping expenditure profile, even when the implicit interest rate is zero.

Clearly, other uncertainty remains about the utility associated with each alternative. For example, might the respondent live past age 80? If so, how should he or she extrapolate from the information provided in the questionnaire? How and when are assets to be liquidated? Given this type of uncertainty, the question remains as to how respondents choose to respond.

Perhaps the question wording provides some clues. The text actually varies across hypothetical-choice questions. Initially, respondents are shown a card with a graphical representation of the alternatives and are asked:

> Which pattern do you like most?

The second question reads as follows:

> Here are the same patterns as before, with two additional choices. Which do you prefer?

It is certainly reasonable to conclude that the questions are intended to elicit "forced choices," but do all respondents do so?

Barsky et al. report on the responses given by 198 individuals. They find that 16 respondents gave responses to the first two questions that were "inconsistent with utility maximization" (e.g., the respondent chose A from {A,C,E} and chose C from {A,B,C,D,E}). Another 42 respondents displayed some other inconsistencies in subsequent questions. The empirical analysis excludes these 58 observations.

**5. Conclusions**

This paper investigates the role of conditioning information in survey reports of subjective phenomena. It does not appear easy to communicate to respondents the types of information on which they should and should not be conditioning. Examples show how unconditional expectations questions may be interpreted as eliciting expectations conditional on certain events. When conditional expectations are elicited, it is difficult to fully describe the events on which the respondent should condition. Moreover, in some cases it is desired that the respondent condition an event under the assumption that it is the endogenous outcome of individual decision-making, whereas in other cases the respondent is hoped to condition on the event as if it were exogenously

determined. Finally, when hypothetical choices are elicited instead of hypothetical-choice probabilities, the survey designer faces the task of specifying not only the conditioning information but also the type of response (e.g., forced choice or most likely choice) that is desired. When respondents resolve the uncertainty about the question in a way that differs from the researcher's assumptions, mistaken conclusions about respondent deficiencies may be reached.

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**Appendix**

**National Education Longitudinal Study**

**1988: 8th grade interview**

46. How sure are you that you will graduate from high school?

very sure, probably will, probably won't, very sure won't

47. How sure are you that you will go on for further education after you leave high school?

very sure, probably will, probably won't, very sure won't

**Table A1**

**Go on for Further Education**

| **Graduate high school** | very sure will | probably will | probably won't | very sure won't | Total |
|---|---|---|---|---|---|
| very sure will | 14,301 | 4599 | 729 | 301 | 19,930 |
| probably will | 818 | 2132 | 620 | 235 | 3,805 |
| probably won't | 16 | 61 | 115 | 51 | 243 |
| very sure won't | ----- | ----- | ----- | ----- | 168 |
| Total | 15,135 | 6792 | 1464 | 587 | 24,146 |

**National Education Longitudinal Study**

**1990: 10th grade interview**

64. Think about how you see the future. What are the chances that..

64A. ...you will graduate from high school?

very high, high, about 50-50, low, very low

64B. ...you will go to college?

very high, high, about 50-50, low, very low

**Table A2**

**Go to College**

| **Graduate high school** | very high | high | 50-50 | low | very low | Total |
|---|---|---|---|---|---|---|
| very high | 8901 | 2312 | 1191 | 408 | 426 | 13,238 |
| high | 172 | 1419 | 938 | 336 | 242 | 3,107 |
| 50-50 | 28 | 84 | 480 | 232 | 202 | 1,026 |
| low | 1 | 7 | 19 | 27 | 30 | 84 |
| very low | 2 | 4 | 11 | 26 | 64 | 107 |
| Total | 9104 | 3826 | 2639 | 1029 | 964 | 17,562 |

**Madison Study of Student Expectations**
(Dominitz and Manski, 1996)

Unconditional Earnings Expectations

Please ignore the effects of price inflation on earnings. That is, assume that one dollar today is worth the same as one dollar when you are 30 years old and when you are 40 years old. And please keep in mind the chance that you will not work for pay, or will only work some of the time, when you are 30 or 40 years old...

Look ahead to when you will be 30 years old. Think about the kinds of jobs that will be available for you and that you will accept...

When you are 30 years old, what do you think is the percent chance that you will earn more than Y dollars per year? (asked for a sequence of earnings thresholds Y)

Expected Earnings under Alternative Schooling Scenarios

The next sets of questions ask you to put yourself in one of two hypothetical situations. In the first situation, you assume that you continue in school until you finish your senior year of HIGH SCHOOL and obtain your diploma, and you DO NOT continue in school after that. In the second hypothetical situation, you assume that you continue in school AT LEAST until you finish your senior year of college and obtain your COLLEGE DIPLOMA (a Bachelor's degree).

When responding to these questions, please attempt to fully place yourself in the hypothetical situation as it is described....Just think about the kinds of jobs that would be available for you and that you would accept. Think about the amount of money you would make on these jobs...

In this hypothetical situation (no school after high school /getting a college diploma or more), what do you think is the percent chance that you would earn more than Y thousand dollars per year when you are 30 YEARS OLD? (asked for a sequence of earnings thresholds Y)

**1993 Survey of Economic Expectations**
(Dominitz and Manski, 1997; Dominitz, 1997)

Employment Expectations

(asked of all respondents)

What do you think is the percent chance (or what are the chances out of 100) that you will be working for pay one year from now?

Earnings Expectations

(asked of respondents who did not report a 0 percent chance of working for pay one year later)

If you are working for pay one year from now, what do you think is the lowest amount of money you personally could possibly be earning per week, before deductions?
Include any overtime pay, commissions, or tips you could receive.

If you are working for pay one year from now, what do you think is the highest amount of money you (personally) could possibly be earning per week, before deductions?
Include any overtime pay, commissions, or tips you could receive.

Still thinking about your own earnings if you are working for pay one year from now...
What do you think is the percent chance (or what are the chances out of 100) that your earnings, before deductions, will be less than $W per week?

(asked for a sequence of earnings thresholds W)

Income Expectations

Now I would like to ask you some final questions about your household income prospects over the next 12 months.

What do you think is the lowest amount that your total household income, from all sources, could possibly be over the next 12 months, before taxes?

What do you think is the highest amount that your total (household) income, from all sources, could possibly be over the next 12 months, before taxes

Still thinking about your total household income, before taxes, over the next 12 months...
What do you think is the percent chance (or what are the chances out of 100) that your total (household) income, before taxes, will be less than $Y?

(asked for a sequence of income thresholds Y)

**Survey of Economic Expectations: Late-1995, Mid-1996 Experimental Module**

505) Thinking about work generally, what do you think is the percent that you will be working full-time when you turn 66 years old?

506) Politicians and the news media have been talking recently about changes in Medicare, the federal health insurance program for senior citizens. Currently, individuals 65 or older receive free insurance coverage, called Medicare Part A, which covers the cost of inpatient hospital care, home health care, hospice care, and some other services.

In addition, these individuals may choose to purchase Medicare Part B, an insurance program which covers the costs of doctor's services, medical tests, and other health services not covered by Medicare Part A. The basic premium paid for Medicare Part B coverage is currently about $45 per month.

506a) Think ahead to when you are about to turn 66 years old. Suppose that Medicare premiums stay as they currently are (about $45 per month for Part B). In this scenario, what do you think is the percent chance that you would choose to purchase Medicare Part B coverage when you turn 66?

506b) In this scenario, what do you think is the percent chance that you would choose to work full-time when you turn 66?

506c) Now, thinking ahead to when you are about to turn 66, suppose that Medicare Part B premiums have doubled, to $90 per month. In this scenario, what do you think is the percent chance that you would choose to purchase Medicare Part B coverage when you turn 66?

506d) In this scenario, what do you think is the percent chance (what are the chances out of 100) that you would choose to work full-time when you turn 66?

512) What do you think is the percent chance that you will live to be 66 years old or more?

513) Please think about how you answered those questions about things that might happen when you turn 66 years old. Were you taking into account the [fill 512] percent chance that you would be alive at age 66, or were you responding under the assumption that you would be alive at age 66?

**1994 Panel Study of Income Dynamics**

Survival Expectations

What is the percent chance that you will live to be 75 or more?

What is the percent chance that you will live to be 85 or more?

Bequest Expectations

What are the chances that you will leave an inheritance totalling $10,000 or more?

What are the chances that you will leave an inheritance totalling $100,000 or more?

**1992 Health and Retirement Study**
(Barsky et al., 1997)

Hypothetical Choices

Now I have a few questions about your preferences for spending and saving as you get older. To make the questions comparable for all respondents in the survey, let's suppose that you are now 50 years old, that you [and your (husband/wife)] will live to be 80. Further suppose that future health care costs are fully covered by insurance, that there will be no inflation, and that income after taxes is guaranteed to be $3000 each month from age 50 to age 80.

K1. [Give card I to R]. [The card] contains several possible patterns of monthly spending before retirement, the striped bars, and after retirement, the solid black bars. By saving part of your income before retirement, you can have more to spend after retirement, as in choice E. Or you could borrow and spend more before retirement, spending less and repaying the loan after retirement, as in choice A. Or you could just spend your income each month, as in choice C. Thus, you can afford *any* of the spending patterns shown on [the card]. Which pattern do you like the most?

K2. [Give card II to R]. Here are the same patterns as before, with two additional choices. Which do you prefer?