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Nonseparable Preferences, Measurement Error, and Unstable Survey Responses

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A person has nonseparable preferences when her preference on an issue depends on the outcome of other issues. A model of survey responses in which preferences are measured with error implies that responses will change depending on the order of questions and vary over time when respondents have nonseparable preferences. Results from two survey experiments confirm that changes in survey responses due to question order are explained by nonseparable preferences but not by the respondent's level of political information, partisanship, or ideology.

1 The Problem

POLITICAL SCIENTISTS ENCOUNTER several problems when interpreting the results of any public opinion survey. Among the most vexing problems: people's survey responses change depending on the order of questions and vary over time. If the instability inherent to survey responses indicates inconsistencies in individual preferences, then populist theories of democracy and rational choice models of political behavior are undermined. If inconsistencies in responses are due to the surveys rather than to the people being surveyed, then one of our most important windows to public opinion is suspect.

Evidence from public opinion surveys cuts to the core of debates about the contribution of formal models to studies of political behavior. Formal models of individual decision-making usually assume that people have fixed preferences, or somewhat stable notions of what they want. But volumes of public opinion research reveal that individuals' responses to important policy questions shift over time and vary according to the order of questions in a survey. Many researchers infer from these findings that most people's political opinions

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are inherently unstable, ill formed, or irrational (Campbell et al. 1960; Converse 1964; Zaller 1992; Zaller and Feldman 1992). Other researchers discount these results and, to varying degrees, subscribe to the idea that people have stable ideal points and well-formed preferences (Achen 1975; Erickson 1979; Judd and Milburn 1980; Page and Shapiro 1992). How do we reconcile these competing claims?

Neither side of the debate fully accounts for the complexity of individual political preferences. More specifically, theories of survey response have overlooked nonseparable preferences. Existing theories of survey response—and existing public opinion surveys—assume that individuals' preferences are separable, or that their preferences on any issue are independent of the outcomes of other issues. People have nonseparable preferences when their preferences on an issue depend on the outcomes of other issues. For example, if a person prefers that the government issue vouchers for students to attend private schools, but only if the amount of funding for public schools does not decrease, then her preference for vouchers is nonseparable from the level of funding for public schools.

Incorporating nonseparable preferences into theories of survey response serves as least three purposes. First, nonseparable preferences can compel respondents who have stable and well-formed opinions to behave as though their opinions are unstable, poorly conceived, or irrational. Second, nonseparable preferences are a source of measurement error in surveys. By understanding nonseparable preferences and other sources of error in surveys, survey researchers will be better equipped to limit those errors. Third, nonseparable preferences are a substantively important undercurrent of opinion that existing surveys do not reveal.

I present a model of survey responses when respondents have nonseparable preferences that are measured with error. The model shows that when individuals have nonseparable preferences, their survey responses may exhibit question-order effects and over-time instability even if they have fixed ideal points. Therefore, unstable survey responses do not necessarily imply unstable underlying preferences. The evidence of response instability accumulated to date is consistent with a model in which respondents have fixed but nonseparable preferences. Results from a small group experiment reveal that question-order effects occur on issues for which people have nonseparable preferences. Results from a larger survey experiment demonstrate that changes in responses due to question order are explained by nonseparable preferences and not by the respondent's level of political information, strength of partisanship, or ideology. The experiments also uncover the extent of nonseparable preferences in public opinion. Before introducing the theory behind nonseparable preferences and survey responses, I review the competing explanations of why responses to survey questions are so unstable.

2 Are Respondents or Surveys to Blame?

In "The Nature of Belief Systems in Mass Publics," Philip Converse (1964, p. 245) argued that "large portions of an electorate simply do not have meaningful beliefs, even on issues that have formed the basis for intense political controversy among elites for substantial periods of time." The work of Converse and others (e.g., Zaller and Feldman 1992; Zaller 1992) reveals several empirical puzzles in survey responses, supporting the conclusion that people's opinions on most political issues are ephemeral and impressionable. Two of these findings are important for the present purposes: (1) it is difficult to predict a person's current opinion on an issue from her previous opinions, and (2) the order in which questions are asked in a survey often changes a person's responses.

Much of the literature on public opinion presumes that if people have well-formed preferences, their responses to survey questions should not change over time. Converse (1964) uncovered significant over-time instability in responses to a panel study that presented a sample of Americans the same set of issue questions in 1956, 1958, and 1960. He found that correlations between individuals' positions on important policy issues in 1956 and 1960 were quite low, usually in the range of 0.3 to 0.4. While the public was seemingly fickle in its issue positions, partisanship remained fairly stable, exhibiting an over-time correlation slightly above 0.7.[1]

Survey responses are also unstable at any given point in time since the order in which questions are presented to respondents can change their responses to those questions. A famous example comes from the following two questions:

(1) "Do you think a Communist country like Russia should let American newspaper reporters come in and send back to America the news as they see it?"
(2) "Do you think the United States should let Communist newspaper reporters from other countries come in here and send back to their papers the news as they see it?"

When respondents answer question 1 before question 2, responses to question 2 lean heavily in favor of allowing reporters from Communist countries into the United States. In reverse order, responses to question 2 tend to oppose allowing Communist reporters into the United States (Hyman and Sheatsley 1950; Schuman et al. 1983; Schuman and Presser 1981). Similar results come from pairs of questions about Japanese and American trade restrictions and limitations on political contributions by business groups and labor unions (Schuman and Ludwig 1983). Other question order effects are well documented across a variety of surveys (Krosnick 1992; Krosnick and Berent 1993; Krosnick and Shuman 1988; Strack 1992; Tourangeau 1992; Tourganeau et al. 1989a, b; Tourangeau and Rasinski 1988).

Since the question pairs that generate such question-order effects are about specific policy issues, they are often referred to as *part–part* question-order effects. Other question-order effects arise when a person is asked a specific then a general question about public policy (*part–whole* effects).[2] While we understand the cause of part–whole question-order effects, part-part order effects still confound survey researchers. Schuman and Presser (1981, p. 77), assessing the state of knowledge on survey response, conclude that

> order effects of all kinds seem to us to constitute one of the most important areas for methodological research. They can be very large, are difficult to predict, and are intimately tied up with both substantive research issues and with further work on individual question forms. At this point research needs to be aimed not merely at producing more examples, but at understanding why those already obtained occur.

Zaller (1992, p. 32) describes such question-order effects as an " . . . embarrassment to the conventional view of opinions" as stable and well formed, and he and many others cite order effects as evidence that people lack fixed or well-formed preferences.

[1] Krosnick and Berent (1993) demonstrate that the difference between party identification and issues in over-time correlations is due largely to differences in the survey instruments.

[2] For example, if a respondent is asked whether she favors or opposes increases in social spending and also asked whether she favors or opposes increases in spending on education, her answers to the questions may depend on their order. If a person is asked the specific question first, she then removes that specific issue area from her interpretation of the general question. Thus, if a person favors increased spending on education but not on other social programs, she may answer that she favors spending on education when it is asked first but that she does not favor increased spending on (other) social programs when the general question is second. When the order of questions is reversed, the respondent will answer that she favors spending on social programs (which include education). Many similar question-order effects can be explained as providing information to respondents about the content and purpose of questions.

Zaller (1992) explains question order effects by arguing that most people do not have well-formed political preferences. Instead, people have considerations that are often conflicting on specific policy issues, and "which of these considerations is available at the top of the head at the moment of confronting survey questions determines responses to the questions" (Zaller 1992, p. 39). Zaller (1992, p. 95) further argues, "... The public, having no fixed true opinion, implicitly relies on the particular question it has been asked to determine what exactly the issue is and what considerations are relevant to settling it." Survey respondents who have high levels of information about politics also have more considerations available to them on any issue, thus the effect of new considerations raised by the order of questions should have less impact on the responses of highly-informed people than on the responses of less-informed people.

If people change their opinions over time, and if their answers depend on seemingly trivial changes in the order of questions, then notions of responsible electorates (Key 1966), reasoning voters (Popkin 1991), and rational publics (Page and Shapiro 1992) become difficult to support. But some political scientists argue that unstable and contradictory survey responses indicate a problem with surveys rather than respondents.

Achen (1975, 1983) challenges Converse's original findings by arguing that measurement error in survey instruments can account for over-time fluctuations in individual responses (see also Erikson 1979; Feldman 1989; Judd and Milburn 1980). Achen describes survey questions as stochastic or probabilistic measures of true attitudes. Each question contains a stochastic component, and changes in individual responses are likely the product of random fluctuations in the error. Respondents are not to be indicted for displaying unstable attitudes or preferences: "Measurement error is primarily a fault of the instruments, not of the respondents" (Achen 1975, p. 1229).

Achen's thesis is clearly correct on statistical grounds. Measurement error can account for fluctuations in individual survey responses. Achen attributes the errors to vague, misleading, or uninterpretable questions. But many survey researchers doubt the importance of measurement error on substantive grounds. In Zaller and Feldman's (1992, p. 582) words,

> When, as all estimates agree, *measurement error typically constitutes one-half or more of the variance of typical attitude items*, one naturally wonders what exactly this 'error' consists of and how it has been generated. Yet we presently know so little about these questions that the term remains essentially an alternative name for 'unexplained variance.'

Giving measurement error so much terrain opens the door to theories that attribute survey responses to things other than the respondent's preferences. It is also not clear how the measurement error model explains systematic shifts in responses of the kind produced by question order; the model is best applied to random rather than systematic changes in responses.

We are left with two competing views of response instability. One side holds that most people do not have stable preferences on most policy issues, thus the blame rests with respondents (Converse 1964; Zaller 1992; Zaller and Feldman 1992). The other side believes that findings that undermine the stable preferences model are due to the inability of surveys to capture those preferences, thus the blame rests with surveys (Achen 1975; Erickson 1979; Judd and Milburn 1980). The model of the survey response in this article demonstrates that if individual preferences are stable but nonseparable, public opinion surveys as currently constructed cannot adequately represent those preferences.

3 Nonseparable Preferences and Unstable Survey Responses

The theory in this article, unlike other theories of measurement error, does not require that measurement error is huge and uncontrollable. Instead, I argue that measurement error, even if relatively small, can contribute to other forms of error in survey responses. Nonseparable preferences, combined with measurement error, produce a cycle of error that can become quite large. I begin with a minimal set of definitions and assumptions about survey respondents, their preferences, and their survey responses.

Definition 1. $\mathbf{J} = \{1, \ldots, j, \ldots, J\}$, $J \geq 2$, is a set of public policy issues.

Definition 2. o_j is an outcome on issue j, $O_j = \{o_j^1, \ldots, o_j^L\}$ is a set of possible outcomes on issue j, $L \geq 2$. $\mathbf{o} = (o_1, \ldots, o_J)$ is a J-tuple of outcomes across all J issues, $\mathbf{o}_{-j}$ is a $J - 1$-tuple of outcomes on all issues except j, and $\mathbf{O}$ is the set of all $\mathbf{o}$.

Definition 3. A survey is an ordered list, $Q = (q_1, \ldots, q_j, \ldots, q_M) \subseteq \mathbf{J}$, of questions about M issues, $M \geq 2$.

Definition 4. Each survey question j presents a respondent with a set of responses $R_j = (r_j^1, \ldots, r_j^N)$, $N \geq 2$. The set (and number) of responses to each question need not be equal. $\mathbf{R}$ is the set of responses to all questions in a survey. r_{ij}^* is individual i's response to question j.

Assumption 1. Each respondent i has a fixed ideal point $\Theta_i = (\theta_{i1}, \ldots, \theta_{iJ}) \in \mathbf{O}^J$, a Euclidean space, and preferences representable by a weighted Euclidean norm, such that for any two vectors of outcomes, $\mathbf{o}$ and $\mathbf{o}'$, $\mathbf{o} \succ_i \mathbf{o}'$ if and only if

$$\|\Theta_i - \mathbf{o}\|_A^2 < \|\Theta_i - \mathbf{o}'\|_A^2 \tag{1}$$

where A is the positive definite matrix of parameters:

$$\begin{bmatrix} a_{11} & \cdots & a_{J1} \\ \vdots & \ddots & \vdots \\ a_{1J} & \cdots & a_{JJ} \end{bmatrix}$$

Such preferences are based on the spatial theory of voting (Enelow and Hinich 1984; Hinich and Munger 1997).[3] If A is an identity matrix ($a_{11} = a_{22} \cdots = a_{JJ} = 1$ and all off-diagonal elements equal zero), then i's preferences are separable, and i attaches equal salience to all issues. When any $a_{jj} \neq 1$ and all off-diagonal elements equal zero, then preferences are separable but i attaches different salience weights to different issues. Graphically, in two dimensions, separable preferences are represented by circular indifference contours or by ellipses whose axes are parallel to the axes of the space.

[3]The spatial model of preferences is useful when preferences are measured with error since the error can be quantified. However, the spatial model cannot be applied to some cases of nonseparable preferences, such as when a person's preferences for a set of issues are nonseparable from the outcome of another issue or set of issues. For a different definition of nonseparable preferences, see Lacy (2001).

Nonseparable preferences are represented by indifference contours whose axes are not parallel to axes of the space. If issues j and k are nonseparable, then $a_{jk} \neq 0$, implying that a jointly determined or covarying weight is attached to dimensions j and k. If $a_{jk} > 0$, the two issues are *positive complements*: a person wants an increase in j as k increases. If $a_{jk} < 0$, the issues are *negative complements*, indicating that a person wants a decrease in j as k increases.

Assumption 1 implies that people have precisely defined preferences, not stochastic preferences characterized by a distribution of possible preferences (Achen 1975). Adding a distribution of possible preferences to each person's ideal point on each issue would not change the results. However, I do not adopt such a view of preferences in this article since I intend to demonstrate that response instability arises even if respondents have fixed ideal points rather than distributions of possible ideal points.

Assumption 2. For any $r_j = o_j, r'_j = o'_j$, and $\mathbf{r}_{-j} = \mathbf{o}_{-j}$, $(r_j, \mathbf{r}_{-j}) \succ (r'_j, \mathbf{r}_{-j})$ if and only if $(o_j, \mathbf{o}_{-j}) \succ (o'_j, \mathbf{o}_{-j})$.

Preferences are defined on **O** and induced on **R**. For the present purposes, the function mapping preferences on **O** to survey responses in **R** is such that every respondent picks the survey response that corresponds to her preferred outcome.[4]

Assumption 3. When a person offers a response to survey question q_j, she does not know $\{q_{j+1}, \ldots, q_M\}$.

I assume that the survey respondent does not know the content of upcoming survey questions, which is the format of nearly all telephone surveys and face-to-face interviews such as the American National Election Studies.

Assumption 4. Survey question $q_k \in \{q_1, \ldots, q_{j-1}\}$ contains a set of responses that approximate, with error ε_{ik}, the kth element of respondent i's ideal point, θ_{ik}.

When a respondent answers a survey question, she projects her ideal point onto the available response and picks the response that is closest. The distance between the projection of her ideal point onto the response scale and the closest response is the *question error*, ε_{ik}. Question error can describe many different things in political surveys, including vague questions or sets of responses that fail to capture the full range of alternatives. What I call *question error* is what most researchers think of when describing measurement error in surveys. This error need not be huge.[5]

Assumption 5. When respondent i answers survey question q_j, she offers a constrained response, $r(q_j \mid (r^*_1, \ldots, r^*_{j-1}))$.

[4]This assumption implies that respondents answer questions sincerely and attempt to reveal their true preferences over outcomes. The model can be extended to cases where respondents offer strategic responses by further specifying their beliefs about other respondents' preferences and by specifying a survey aggregation function that maps a collection of survey responses into policy outcomes. Such an exercise is beyond the scope of this paper and unnecessary for the results that follow. However, the results that follow are consistent with a model in which a survey response aggregation function is monotonic and respondents eliminate weakly dominated response strategies.

[5]Measurement error is not necessary to produce response instability if respondents condition their responses on their beliefs about the status quo on other issues. For a discussion of nonseparable preferences in survey responses when surveys do not contain measurement error, see Lacy (2001).

The assumption implies that a respondent seeks to offer a vector of responses as close as possible to her ideal point. A respondent's answer to any question is constrained by her answers to previous questions. While the model assumes that respondents recall their answers to previous questions in the survey, this assumption can be revised so that respondents recall only their previous t responses, where t varies across individuals. Respondents possessing limited short-term memories may recall only their response to the previous question in the survey, $t = 1$. Other respondents may recall many of their previous responses, $t > 1$.

Together, these assumptions imply that a person's responses to survey questions vary across question orders if and only if her preferences are nonseparable, which the following result establishes.

Result 1. $r_i^*(q_j \mid r_{ik}^*) \neq r^*(q_j)$ if and only if i has nonseparable preferences for issues k and j, $(r_{ik}^* - \theta_{ik}) \neq 0$, and $(a_{ijk}/a_{ijj})(r_{ik}^* - \theta_{ik}) \neq -\varepsilon_{ij}$.

Result 1 (see Appendix A for proof) demonstrates that a respondent's answer to question j following question k will not be the same as her answer to question j asked alone (or before question k) if and only if her preference for j is nonseparable from k, her response on k is not identical to the projection of her ideal point onto k due to measurement error on k, and the product of measurement error on k and the nonseparability weight on jk does not exactly negate the measurement error on j.

To illustrate how the model explains question-order effects, suppose a respondent has an ideal point $\Theta_i \in \mathbf{o}^J$ (for purposes of illustration, $\mathbf{o}^2$) and indifference contours that indicate nonseparable preferences, as in Fig. 1. Suppose also that a survey presents the respondent with seven categories of response—typical American National Election Studies questions—on each of the two issues. The hash marks in Fig. 1 represent available responses.

Suppose that when a respondent answers survey questions, she attempts to reveal her ideal point in $\mathbf{o}^J$. Survey questions approximate this ideal point on successive dimensions, with each dimension containing an error. When we ask a respondent to represent her ideal point i on question k (Fig. 1), containing a set of responses $(k^1, \ldots, k^7)$, the respondent chooses the closest category of response. The distance between the respondent's ideal point projected onto k and the closest category of response, k^5, is ε_k, which is the *question error* on response k. Since the respondent must approximate her ideal point by the available categorical responses, there is immediately some error in projecting an ideal point onto any question in the survey. This may be what Achen (1975) had in mind as the measurement error in surveys.

After a respondent offers a response to a question, she imposes a constraint on herself, recalling her previous responses before answering the next question. The constraint may be rigid: the respondent recalls the precise response over a series of questions. Or the constraint may be casual: the respondent thinks about the issues appearing in previous questions before answering the current question. A series of constrained responses will vary depending on the order in which the constraints are imposed. To illustrate, after the respondent chooses a response on issue k, we ask her preference on dimension j. Given the response of k^5 on dimension k, the respondent finds the point of tangency on her indifference contours of a perpendicular line extended from k^5. The respondent then picks the response on dimension j that is closest to the point of tangency. The closest response on j is j^2. Were question j asked first, the respondent would have chosen j^4. The distance between the projection of i onto j when j is asked first and the projection of i onto j when j is asked after k is the *carryover error* from question k to question j, denoted γ_{jk}. In Fig. 1, one might argue that the respondent should choose response $r = (5, 4)$ over response $r' = (5, 2)$. However, r' is on an indifference contour closer to the respondent's ideal point than r.

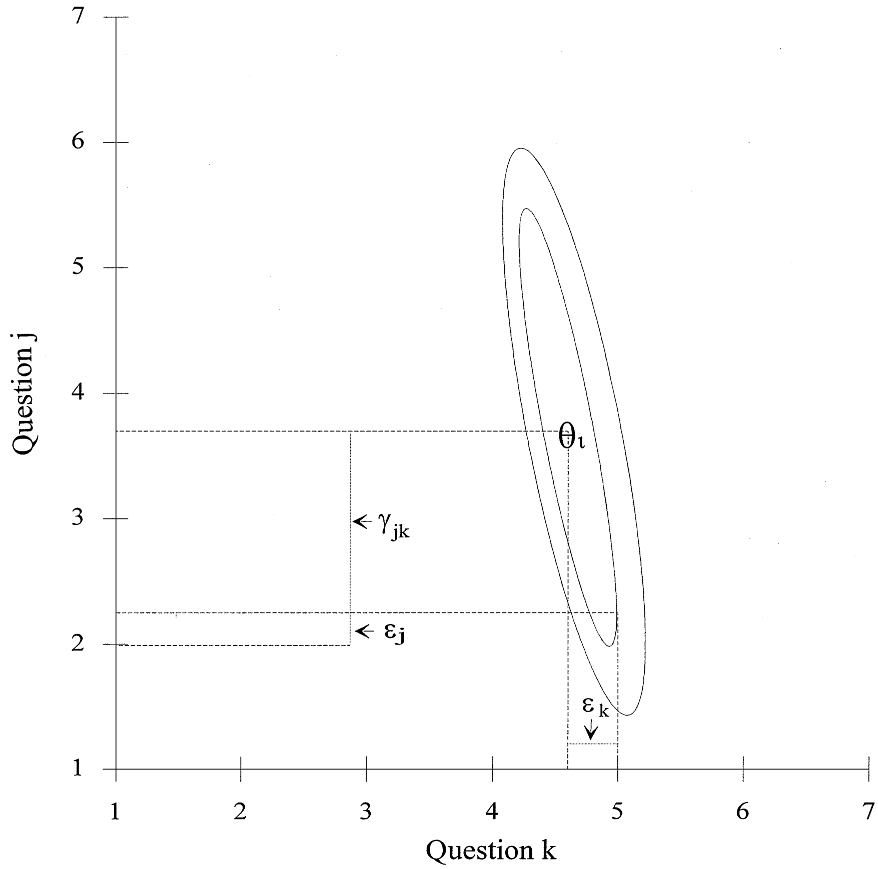

Fig. 1 Nonseparable preferences generate a question order effect. When a respondent who has nonseparable preferences is asked her preference on question k, she picks the response closest to her ideal point, Θ_i, projected onto k. The closest response is k^5, with question error ε_k. If the respondent answers question j after question k, she picks the response closest to the point of tangency on her indifference contours of a perpendicular line extended from k^5. The closest response is j^2, which includes question error ε_j. If the respondent answers question j first, the response closest to her ideal point is j^4. The distance between j^4 and j^2 is the carryover error, γ_{jk}, from question k to question j.

Measurement error contains both a *question error* and a *carryover error* when respondent preferences are nonseparable. The *carryover error* can be larger than the question error associated with an individual question, and it can also negate the question error. Even trivially small question errors can produce massive carryover errors. Each response j by respondent with ideal point i, denoted r_{ij}, can be characterized by an equation where θ_{ij} is the projection of the individual's ideal point onto question j. The i subscript is dropped throughout.

$$r_1 = \theta_1 + \varepsilon_1$$
$$r_2 = \theta_2 + \varepsilon_2 + \gamma_{12}$$
$$r_3 = \theta_3 + \varepsilon_3 + \gamma_{13} + \gamma_{23}$$

$$\vdots$$

$$r_m = \theta_m + \varepsilon_m + \gamma_{1m} + \cdots + \gamma_{(m-1)m}$$

If a person has nonseparable preferences for issues 1 and 3, but not for issues 2 and 3, then $\gamma_{13} \neq 0$, while $\gamma_{23} = 0$. Each response is a function of the respondent's ideal point projected onto the relevant dimension, plus the question error on that dimension, plus the carryover error from any preceding issue in the survey that is nonseparable from the current issue in the respondent's preferences. Carryover error can be negative or positive.

Carryover error will *not* arise between responses when respondents have separable preferences. Figure 2 shows the indifference contours of a respondent who has separable preferences over two issues. If asked question k first, the respondent projects her ideal point onto k and responds k^5. The point of tangency on her indifference contours of a segment dropped to k^5 reveals that the point of tangency along j is the same as the respondent's ideal point projected onto j. Since the respondent's indifference contours are symmetric to perpendicular lines dropped to either axis, there is no trade-off across dimensions and the respondent will choose the response on each dimension that is closest to her ideal point,

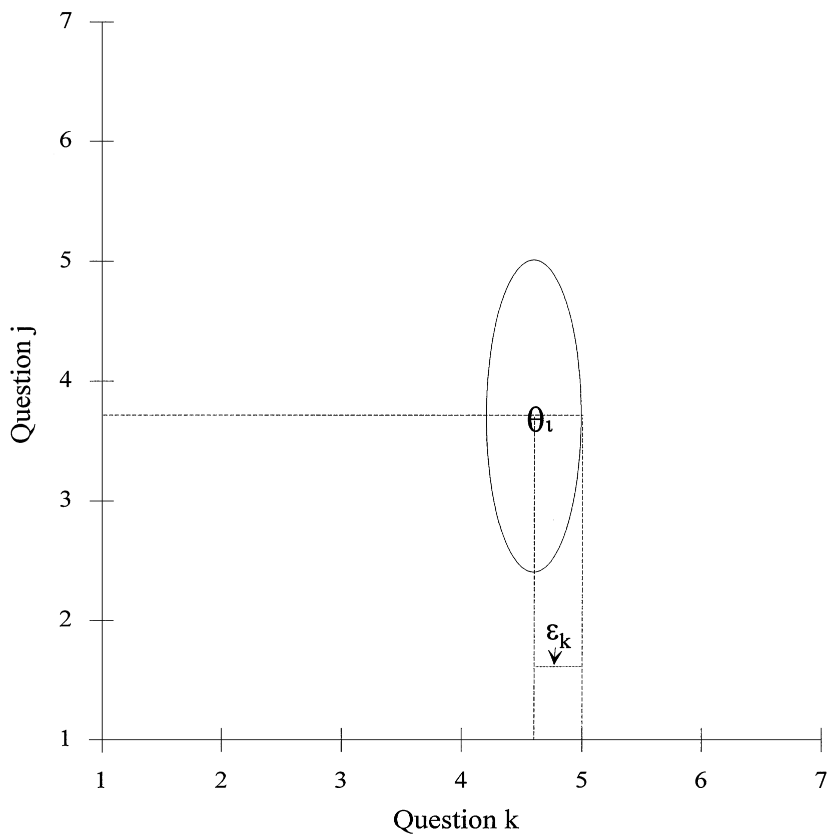

Fig. 2 When a respondent has separable preferences for issues j and k, the question order effect disappears. If asked question k first, the respondent projects her ideal point, Θ_i, onto k and responds with k^5, which contains question error, ε_k. The point of tangency on her indifference contours of a segment dropped to k^5, or to any other response on k, coincides with the respondent's ideal point projected onto question j.

regardless of the answers on preceding questions. If a respondent's preferences between issues j and $j-1$ are separable, then $\gamma_{j(j-1)}=0$. But any question k prior to $j-1$ can produce a carryover error on question j if preferences between j and k are nonseparable.

To apply the notion of *carryover error* to a real-world phenomenon, reconsider questions about allowing American newspaper reporters into Communist countries and Communist reporters into the United States. Suppose we map these two questions and the simple two-category response on each of them as in Fig. 3. Now suppose that respondent i has an ideal point Θ_i. This person believes that American reporters should be allowed in Communist countries in most circumstances because they represent a free press. But the person also believes that Communist reporters should be allowed into the United States only under restrictive circumstances. Maybe she believes that Communist reporters do not represent a free press. Maybe she believes that Communist reporters will not report the news accurately and objectively. Or maybe she believes that all Communist reporters are spies. Whatever the case, her opinion on allowing Communist reporters into the United States shades toward "No," though her opinion probably contains many qualifiers and exceptions that cannot be captured by a question with a binary response. When asked the question about allowing Communist reporters in the United States, the respondent answers "No." The distance from her ideal point projected onto the vertical axis and the "No" response is the question error.

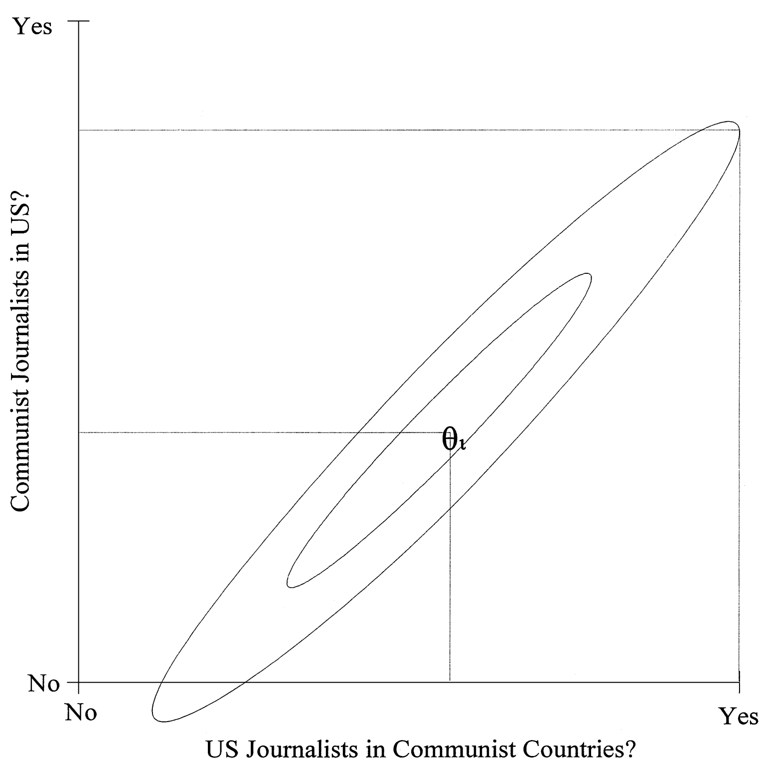

Fig. 3 A respondent with ideal point Θ_i has nonseparable preferences for allowing American journalists in Communist countries and Communist journalists in the U.S. If she is first asked whether American journalists should be allowed in Communist countries, she answers "Yes" since that response is closest to her ideal point. If she is then asked whether Communist journalists should be allowed in the U.S., she answers "Yes" as well given her response to the previous question. But if she is first asked whether Communist journalists should be allowed in the U.S., she answers "No" since that response is closest to her ideal point.

Now suppose the respondent is first asked to express an opinion about American reporters being allowed in Communist countries. She supports American reporters abroad with a few reservations, so when she answers the question her opinion shades toward "Yes." Now she imposes a constraint on herself by projecting her response on the horizontal axis onto her indifference contours. Her indifference contours over the two dimensions indicate positive complementary preferences: The more access that Communist countries give to American reporters, the more access the United States should give to reporters from Communist countries. Imposing the constraint on her indifference contours yields a point of tangency that is close to the "Yes" response on the vertical axis. The order in which the questions are asked changes the respondent's revealed opinion, yet her ideal point remains fixed. The dramatic change in response is produced by nonseparable preferences combined with a large initial question error.

The model also explains over-time instability in survey responses. Panel surveys of the kind examined by Converse (1964) are susceptible to question-order effects if respondents recall questions from the previous survey when answering the current survey. In this sense, over-time instability is simply an extension of question order effects over different waves of a panel. Responses to the same question across different waves of a panel may also change if a respondent's beliefs about the status quo change. In the proof of Result 1, note that a respondent's constrained ideal point on issue j is

$$o_j \mid o_k = \theta_j - \left(\frac{a_{jk}}{a_{kk}}\right)(o_k - \theta_k) \qquad (2)$$

Her constrained ideal point on j will not be identical to the projection of the jth element of her ideal point, θ_j, onto j if and only if $(a_{jk}/a_{kk})(o_k - \theta_k) \neq 0$, meaning that her preferences for j and k are nonseparable, and the outcome (status quo) on k differs from the projection of the kth element of her ideal point onto k. The status quo on k, or the respondent's beliefs about the status quo on k, may change across time. If the respondent's preferences for j and k are separable, such changes should not affect her response to j. But if the respondent's preferences for j and k are nonseparable, then any change in o_k will change her response to j. If we expect that responses to survey questions should not change over time, then we must assume that respondent's beliefs about issues that are nonseparable also do not change over time. Such an assumption is heroic in many cases, especially during the period examined by Converse (1964).

A theory of response instability based on nonseparable preferences adds substantive meaning to measurement error theories. As Zaller (1992, p. 75) argues, "In the measurement error tradition, response error is simply so much noise. It has no substance and signifies nothing of interest about the nature of mass opinion." In my model, measurement error prevents people from expressing their true attitudes in sufficient detail or with sufficient precision, thus forcing them to offer rough approximations of their ideal points. Combined with nonseparable preferences, these rough approximations can lead to a snowball of error that lends further credence to the idea that response instability is as much, or perhaps more, the product of simplistic surveys as simple-minded respondents.

The model presented here complements the model of Lacy (2001), in which preferences are measured without error, but respondents answer survey questions conditional on their beliefs about the status quo on other issues. In both models, response instability—either over time or across question orders—arises only if respondents have nonseparable preferences. The two models may apply to different issues in different contexts. The model in this article is best applied to issues that produce measurement error, particularly closed-ended questions that require respondents to approximate their ideal points given a limited set of responses.

4 Evidence of Nonseparable Preferences

My model of survey responses implies that an individual's responses to questions in public opinion surveys will exhibit order effects only if her preferences are nonseparable. Two separate survey experiments test whether nonseparable preferences produce aggregate-level and individual-level question-order effects. The first experiment demonstrates that aggregate-level order effects similar to those in the classic studies of Hyman and Sheatsley (1950) occur when a large percentage of respondents has nonseparable preferences. The second experiment demonstrates at the individual level that order effects are due to nonseparable preferences and not to a respondent's level of political information, ideological extremism, or partisanship.

4.1 *Experiment 1: Nonseparable Preferences and Classic Order Effects*

In one double-blind experiment, 32 subjects—university students ages 18 to 40—were randomly assigned to two treatment groups. An experimenter read survey questions to each group of subjects separately. Subjects circled responses anonymously on answer sheets that did not reveal the content of upcoming questions. The experimenter presented each group with pairs of questions similar to the classic questions on Communist journalists. Respondents were asked first a block of questions on their opinion on trade restrictions, then a block of questions on campaign funding.[6]

(1) "Do you think the U.S. government should set limits on how much Japanese industry can sell in the United States?"

(2) "Do you think the Japanese government should set limits on how much American industry can sell in Japan?"

In one group, subjects answered question 1 then question 2. Fourteen of 16 subjects answered "Yes" to 1, while 13 of 16 answered "Yes" to 2. The other group answered the questions in reverse order. Six of 16 answered "Yes" to question 1 above, while 8 of 16 answered "Yes" to 2. The difference in responses to questions between the two treatment groups produces a χ^2 significant at $p < .05$. First asking subjects about Japanese limits on American products makes subjects more likely to oppose limits on Japanese imports. Five of 32 respondents offered different responses to questions 1 and 2, answering "Yes" on one and "No" on the other.

Immediately following these questions, the experimenter read two questions asking respondents their preferences for U.S. limits on Japanese imports depending on two outcomes on Japanese limits on American imports.

> "If the Japanese government sets limits on how much American industry can sell in Japan, do you think the U.S. government should set limits on how much Japanese industry can sell here?"
>
> "If the Japanese government allows unlimited sale of American products in their country, do you think the U.S. government should allow unlimited sale of Japanese products here?"

[6]These questions are from Schuman and Ludwig (1983).

A respondent has nonseparable preferences if her preference for U.S. limits on Japanese imports depends on whether Japan limits American imports. Given the wording of the questions, a person has nonseparable preferences if she offers the same response to the two follow-up questions. In the two treatment groups, 15 of 32 respondents answered "Yes" to both questions, indicating nonseparable preferences. No one answered "No" to both questions. Therefore, 47% of respondents have nonseparable preferences for Japanese restrictions on U.S. imports and U.S. restrictions on Japanese imports.

Following the questions on trade restrictions, respondents were asked,

(1) "Do you think labor unions should be permitted to spend labor funds to help elect or defeat candidates for political offices?"
(2) "Do you think business corporations should be permitted to spend corporate funds to help elect or defeat candidates for political offices?"

When question 1 appeared before question 2, 0 of 16 respondents answered "Yes" to question 1, and 3 of 16 answered "Yes" to question 2. With the order reversed, 6 of 16 respondents answered "Yes" to question 1 and question 2. The difference in responses to the labor question is significant at $p < .05$. However, the difference in responses to the business question is not significant. Sixteen of 32 respondents offered different responses to questions 1 and 2.

Two follow-up questions tapped nonseparable preferences.

> "If labor unions are permitted to spend money to help elect or defeat candidates for political office, then should business corporations also be permitted to spend money to elect or defeat political candidates?"
>
> "If labor unions are prohibited from spending money to help elect or defeat candidates for political office, then should business corporations also be prohibited from spending money to elect or defeat political candidates?"

Nineteen of 32 subjects (59 percent) have nonseparable preferences since they answered "Yes" to both follow-up questions. No respondents answered "No" to both follow-ups.

The experiment confirms that on issues similar to the classic example of Communist and American journalists, approximately half of the respondents have nonseparable preferences. These aggregate-level question-order effects may be due to nonseparable preferences. There is certainly not sufficient evidence to reject the hypothesis that aggregate-level question-order effects occur only when a large percentage of the sample has nonseparable preferences for the issues that produce the order effect.

4.2 *Experiment 2: Individual-Level Order Effects and Nonseparable Preferences*

A second and more extensive survey experiment demonstrates that nonseparable preferences account for question order effects at the individual level when respondents have nonseparable preferences. The experiment also reveals the prevalence of nonseparable preferences in public opinion. Subjects were 416 adult residents of Franklin County, Ohio, contacted by telephone using random-digit dialing during February 1998.[7] The questionnaire contained five pairs of issue questions (see Appendix B for questions):

[7] The Center for Survey Research at Ohio State University conducted the survey. Two hundred phone numbers failed to produce interviews on multiple call-backs. Only 10 respondents failed to complete the interview. Franklin County is not an exactly representative U.S. county, but it is close enough to be a major test market for new products and advertising campaigns.

Spending on defense and spending on social programs
English as the official U.S. language and immigration
Abortion and aid to low-income women and children
Spending on environmental clean-up and pollution regulations
State income taxes and state spending to prevent crime

Respondents were randomly assigned to one of two groups. In one group, respondents answered the issue questions in each pair in one order, while the other group answered the questions in reverse order. Following each pair of issue questions, all respondents answered a series of questions that uncover nonseparable preferences. For example, the block of questions on state income tax and anticrime spending included the following questions:

(1) Do you think the state of Ohio should spend more money to fight crime, less money to fight crime, or continue spending the same as it does now?

(2) Do you think the state of Ohio should increase income taxes, cut income taxes, or keep income taxes where they are now?

(1A) If the state of Ohio significantly cut income taxes, then would you want the state to spend more money to fight crime, less money to fight crime, or continue spending the same as it does now?

(1B) If the state of Ohio significantly increased income taxes, then would you want the state to spend more money to fight crime, less money to fight crime, or continue spending the same as it does now?

(2A) If the state of Ohio significantly reduced the amount of money it spends to fight crime, then would you want the state to increase income taxes, cut income taxes, or keep income taxes where they are now?"

(2B) If the state of Ohio significantly increased the amount of money it spends to fight crime, then would you want the state to increase income taxes, cut income taxes, or keep income taxes where they are now?

All questions were followed with a branching question, "Is that a lot more (less), somewhat more (less), or a little more (less)?" The order of the blocks of questions was completely randomized in each interview.

If a respondent offered a different answer to the two conditional follow-up questions on an issue (e.g., 1A and 1B on anticrime spending or 2A and 2B on taxes), then her preference on that issue is nonseparable from the other issue in the pair. Significant percentages of respondents have nonseparable preferences on several issues. On spending to clean up the environment, 71% of the sample has a preference that depends on the status quo on pollution regulations. On taxes, 54% of the sample has a preference that is nonseparable from the amount of money spent to fight crime. Forty-eight percent of respondents have nonseparable preferences on the amount of money spent to fight crime, 40% on social spending, 37% on welfare programs for low-income women and their children, 34% for pollution regulations, 28% for defense spending, and 17% for immigration. Two issues in the survey have a very low incidence of nonseparable preferences. Only 8% of respondents have a preference for English as the official U.S. language that depends on immigration levels, and only 2% have an opinion on abortion that depends on the level of welfare spending for low-income women and their children.

Data from the survey permit an individual-level test of the prediction of the model. Existing studies of order effects do not probe how the order of questions changes an individual's survey responses since once the questions are presented to a respondent in one order, the order effect has already occurred. Presenting the questions to the respondent again in a different order is a viable research design only if the respondent has completely forgotten the questions. Using data from the split-half sample in the survey, I test how an individual's responses *would* change if she had answered the questions in each pair in reverse order.

I regressed responses to each issue in the survey on the respondent's party identification, ideology, race, gender, income, age, response on the other issue in the pair, level of political knowledge, and on dummy variables indicating whether the respondent has nonseparable preferences on the issue (one dummy for positive complements, another for negative complements).[8] I estimated regression coefficients separately for respondents in each half of the survey using ordinary least squares (OLS), ordered probit, or binary probit depending on whether the responses on the issue were recorded on a 7-point, 4-point (abortion), or 2-point scale (English as the official language). Using coefficients from these regressions, I calculated a predicted response on each issue for each respondent who was not in the same half of the sample as the respondents I used to estimate the model's parameters. For each respondent, I then have her response on each issue as well as her predicted response if the question had been asked in a different order. The difference between these two responses is a measure of how a person's response would change depending on the order of the questions in the survey. I hypothesize that respondents who have nonseparable preferences on an issue will exhibit systematic differences in their responses between the two question orders.

A widely accepted hypothesis holds that a respondent's level of political awareness produces shifts in responses due to question order (Zaller 1992; Zaller and Feldman 1992). If a person is highly aware of politics and has many considerations accessible on any issue, then the activation of any one of those considerations due to previous survey questions should have less of an impact on her response than on the response of someone who has few considerations. Someone who has few considerations on an issue will exhibit greater response instability across question orders since preceding questions will activate new considerations. Therefore, previous questions in a survey are responsible for a relatively larger number of considerations for less politically aware respondents than for more aware respondents.

Zaller (1992) measures political awareness as the respondent's level of factual information about politics. The Franklin County survey included three questions to gauge political information (see Appendix). A respondent could answer zero to three of these questions correctly, thus creating a 4-point information scale (Delli Carpini and Keeter 1997). Respondents were also asked how many days per week they read a newspaper and how many years of school they completed. I factor analyzed the scores on the political knowledge questions, education, and frequency of newspaper reading, creating an information score for each respondent.[9] The scores are approximately normally distributed, with a range of -1.88 to 1.2 and a mean of 0. Zaller and Feldman's model of survey response predicts that the greater a respondent's level of political information, the less difference between her responses across question orders.

Proponents of the information-based model of response instability might argue that it is the relative balance of considerations on either side of an issue—not the number of considerations a person possesses—that determines instability. To capture a respondent's balance of political considerations, I include the respondent's ideology and party identification, both measured on standard 7-point scales and folded so that a value of 0 indicates

[8] All of the results that follow hold even if information and nonseparable preferences are not included in the imputing regressions. However, since I am testing a theory that responses to questions are due to nonseparable preferences or to information, these variables should be included in the imputing regressions.

[9] Factor loadings for knowledge, education, and newspaper readership are 0.54, 0.50, and 0.21, respectively.

someone who is moderate or Independent and a value of 3 indicates a strong partisan or extreme ideologue. Respondents who did not answer the ideology or partisanship questions receive scores of 0 on the scales.

I test the hypothesis that nonseparable preferences produce question-order effects by estimating the standard regression model:

$$y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \beta_3 x_{i3} + \beta_4 x_{i4} + \beta_5 x_{i5} + e_i \tag{3}$$

where y_i is i's response to a question when it is asked second in the pair minus i's response to a question when it is asked first, x_{i1} is a dummy variable indicating whether i has nonseparable preferences (positive complements), x_{i2} is a dummy variable indicating nonseparable preferences (negative complements), x_{i3} is i's level of political information, x_{i4} is i's ideological intensity, and x_{i5} is i's partisan intensity.

I estimate this model for each of the 10 issues in the survey using OLS.[10] Since the dependent variable is the difference in responses rather than the absolute value of the difference, the model explains systematic rather than random changes in responses due to question order. I distinguish people who prefer the issues as positive complements from those who prefer them as negative complements since the order effects for the two groups may move in different directions. Separable preferences are the omitted category among the trichotomy of preferences. Table 1 presents the OLS estimates.

The results offer strong confirmation for the hypothesis that question-order effects are due to nonseparable preferences and not to a respondent's level of political information or balance of considerations. A respondent's information score is a statistically significant predictor of differences in responses for only 2 of the 10 issues: taxes and abortion. Less informed respondents are more inclined to favor tax cuts when the tax question appears before the anticrime spending question than when it appears after the anticrime spending question. On abortion, less informed respondents are more likely to adopt a prochoice position when the abortion question appears before the AFDC question.

A respondent's ideological intensity is statistically significant for three issues: income taxes, social spending, and abortion.[11] Ideological moderates show greater support for tax cuts when the tax question appears before the anticrime spending question than when it appears after the anticrime spending question. On social spending, ideological moderates favor greater social spending when the question appears after the defense spending question. Ideological moderates also offer greater support for a prochoice position on abortion when the

[10] I use OLS since the predicted values for opinions on abortion and English assume non-integer values; however, the results are unchanged if I transform the predicted values for abortion and English to integers. Franklin (1989) details a similar method of imputing values for questions not asked in a survey. King, et al. (2001) have developed a method for creating multiple imputed data sets for data containing missing values (see also Gelman, King, and Liu 1998). In a split-half sample with respondents randomly assigned to survey forms, the data are missing completely at random. An advantage of King's method is that it accounts for uncertainty in the predicted values of imputed responses. It also imputes values for responses that are missing when the respondent refuses to answer a question or does not have an opinion. I estimated the model using King, et al.'s software package, Amelia (http://gking.harvard.edu/stats.shtml#amelia). After creating five data sets of imputed values for each pair of questions, averaging the OLS coefficients across the estimates derived from each data set, and adjusting the standard errors for uncertainty in the imputations, I found that the results change only minimally. The results for information drop below $p < .05$ for income taxes and abortion. The results for nonseparable preferences (negative complements) for English reach statistical significance ($p < .01$), while the results for abortion (positive complements) drop below $p < .05$. Responses to pollution regulations violate the somewhat strict normality assumptions in Amelia.

[11] If a respondent's ideological position is measured on the 7-point scale rather than folded, ideology is not a statistically significant predictor of response instability for any of the issues.

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Table 1 Predictors of individual-level question-order effects

Difference in responses on question about	*Nonseparable preferences*						
	Positive complements	*Negative complements*	*Information*	*Ideological intensity*	*Partisan intensity*	*Constant*	N
Income taxes	0.67*	0.50	−0.41*	−0.18*	0.14	−0.09	351
	(0.16)	(0.32)	(0.13)	(0.08)	(0.08)	(0.19)	
Crime spending	0.39*	0.11	0.00	0.08	0.03	−0.74*	360
	(0.15)	(0.24)	(0.11)	(0.07)	(0.08)	(0.20)	
Clean up environment	−0.64*	−0.70*	0.01	0.05	0.02	0.58*	356
	(0.25)	(0.21)	(0.14)	(0.08)	(0.08)	(0.26)	
Pollution regulations	0.07	0.62*	−0.05	−0.01	−0.06	0.19	365
	(0.17)	(0.19)	(0.11)	(0.06)	(0.06)	(0.16)	
Defense spending	−0.85*	−0.70*	0.05	0.13	0.13	−0.67*	372
	(0.21)	(0.27)	(0.13)	(0.08)	(0.09)	(0.20)	
Social spending	0.44	0.99*	0.10	0.33*	−0.16	−0.48*	361
	(0.32)	(0.19)	(0.13)	(0.09)	(0.09)	(0.22)	
AFDC programs	−0.28	0.19	−0.04	0.07	0.03	−0.57*	309
	(0.32)	(0.19)	(0.14)	(0.09)	(0.09)	(0.21)	
Abortion	0.55*	−0.53	0.25*	−0.17*	0.01	0.14	307
	(0.13)	(0.31)	(0.08)	(0.05)	(0.06)	(0.13)	
Immigration	−0.01	−0.15	−0.08	0.04	0.01	−0.19	331
	(0.59)	(0.25)	(0.14)	(0.09)	(0.09)	(0.21)	
English	0.00	0.34	0.01	0.03	0.00	−0.07	302
	(0.11)	(0.24)	(0.03)	(0.02)	(0.02)	(0.05)	

Note. Source: 1998 Survey of Nonseparable Preferences. Entries are OLS estimates, with robust standard errors in parentheses. $^*p < .05$, two-tailed.

abortion question appears before the question on AFDC programs. Strength of partisanship is not a statistically significant predictor of response instability for any of the issues.

Nonseparable preferences explain response instability on 7 of the 10 issues, including the 2 issues for which information is statistically significant and the 3 issues for which ideological commitment is significant. On tax cuts and anticrime spending, most respondents who have nonseparable preferences see the two issues as positive complements. Forty-five percent of respondents prefer that tax rates go down as crime spending goes down, indicating that the issues are positive complements. These respondents favor higher taxes (or oppose significant tax cuts) after they answer the question on anticrime spending. Thirty-seven percent of respondents prefer anticrime spending as a positive complement of taxes, and they are more likely to favor increases in anticrime spending after they answer the question on taxes. The percentages of people who have nonseparable preferences indicating negative complements on taxes (9.4% of responses) and anticrime spending (10.1%) are small and may be due to random errors in responses.

Most respondents who have nonseparable preferences on antipollution regulations and spending on environmental cleanup see these as negative complements. Over 46% of respondents answer that spending on environmental cleanup should increase as industries are allowed to release more pollution, but spending should decrease as industries are allowed to pollute less. Unlike the tax and crime spending issues, people with nonseparable preferences that are either positive complements or negative complements are more likely to respond that spending on environmental cleanup should go up if the question appears before the question on pollution regulations. If the question appears after the question on pollution regulations, both types of people are less likely to approve increases in spending on environmental cleanup. This result is explainable. A respondent who prefers environmental spending and regulations as negative complements might answer the spending question by saying that spending should increase. But if she first answers the regulation question, she responds that regulations should increase significantly, after which she will answer the spending question by saying that spending should decrease. A respondent who sees spending and regulations as positive complements and who answers the spending question first may say that spending should decrease. When she answers the regulation question first, she answers that regulations should increase and then answers that spending should increase as well since the two are positively related.

A similar pattern holds for defense spending, as both nonseparable preference indicators are statistically significant. Respondents with nonseparable preferences are evenly split between those whose preferred level of defense spending declines as social spending increases (13.5% of respondents) and those whose preferred level of defense spending increases as social spending increases (14.5% of respondents). Both groups tend to favor deeper cuts (or smaller increases) in defense spending after answering the question about social spending.

Thirty-one percent of respondents prefer social spending as a negative complement of defense spending: as defense spending increases, social spending should decrease. Only 8.9% of respondents prefer social spending as a positive complement of defense spending. Respondents who view social spending as a negative complement of defense spending favor greater increases in social spending after answering the question on defense spending. Most respondents who have nonseparable preferences on social spending believe that defense spending should be cut, which allows them to favor greater increases in social spending once they have offered their opinion on defense spending.

On the remaining issues—abortion, immigration, AFDC programs, and English as the official language—most respondents have separable preferences. However, nonseparable preferences produce a question-order effect for abortion conditional on the level of spending to help low income women and their children. A respondent who believes that abortion policy should be a positive complement of the level of AFDC spending opposes abortion restrictions as AFDC spending increases. When these respondents answer the AFDC questions first, they are more likely to oppose restrictions on abortion.[12]

The results demonstrate that nonseparable preferences account for systematic shifts in individual-level responses due to question order across most of the issues in the survey, especially for the issues on which large percentages of respondents have nonseparable preferences. Nonseparable preferences explain systematic shifts in responses for more issues than the respondent's level of political information, ideological intensity, or partisan intensity.

5 Conclusions

When people have fixed and well-formed preferences, they may exhibit the same unstable responses to public opinion surveys that researchers most often cite as evidence refuting

[12]For further discussion of the substantive interpretation of order effects on these issues, see Lacy (2001). In Table 1, the signs on the coefficients for some issues are the reverse of the coefficients reported by Lacy (2001). In that article, I defined the difference in responses on each issue as the response to Form 1 of the survey minus the response to Form 2. In this article, I reverse the coding of taxes, environmental cleanup, defense spending, abortion, and immigration so that the dependent variable is the response when the question is asked second in the pair minus the response when the question is asked first.

the assumption of fixed preferences. Formal modelers often face the criticism from empirical researchers that rational choice models are overly simplistic and their assumptions too restrictive. This article demonstrates that an important insight from formal theory—nonseparable preferences—expands the richness and complexity of theories of political behavior in ways that empirical research has yet to explore.

Nonseparable preferences provide a theoretically motivated and substantively useful explanation for measurement error in survey responses. Measurement error to date has been defined as a stochastic component of survey responses due to faulty survey instruments. This article continues with the measurement error tradition but adds a theoretical reason why surveys produce systematic errors in representing preferences. Further advances in survey research can minimize such errors by asking respondents directly how their preference on one issue might change in response to changes in the status quo on other issues. Also, by allowing survey respondents to see or hear the entire survey before answering any question, researchers can minimize the errors produced by question order (see Lacy 2001). Survey responses more accurately represent respondents' opinions when the respondents know the context and format of the survey.

Nonseparable preferences may also explain over-time instability in survey responses. Panel surveys are susceptible to question-order effects if respondents recall questions from the previous survey when answering the current survey. Respondents to panel studies may also change their induced preferences on one issue if they perceive that the status quo has changed on issues that are nonseparable. Further empirical research is needed to determine whether the issues that produce over-time instability in responses are also the issues that are nonseparable to many survey respondents.

6 Appendix A: Proof of Result 1

Proof. The preferences described in Assumption 1 are representable by the quadratic utility function:

$$U_i(o_j \mid o_k) = -\left[a_{ikk}(o_k - \theta_{ik})^2 + 2a_{ijk}(o_k - \theta_{ik})(o_j - \theta_{ij}) + a_{ijj}(o_j - \theta_{ij})^2\right] \tag{4}$$

Maximizing this function with respect to o_j, dropping i, and rearranging terms:

$$o_j \mid o_k = \theta_j - \left(\frac{a_{jk}}{a_{kk}}\right)(o_k - \theta_k) \tag{5}$$

which is i's constrained ideal point on issue j given o_k. Now i's response on j conditional on a response of r_k^* to k is

$$r(q_j \mid r_k^*) = \theta_j - \left(\frac{a_{jk}}{a_{jj}}\right)(r_k^* - \theta_k) + \varepsilon_j \tag{6}$$

which now includes the question error on question j. If preferences are nonseparable, then (a_{jk}/a_{jj}) is nonzero. If question k produces question error, then $(r_k^* - \theta_k)$ is nonzero. If both terms are nonzero, then $r^*(q_j \mid r_k^*) \neq r^*(q_j)$ as long as $(a_{jk}/a_{jj})(r_k^* - \theta_k) \neq -\varepsilon_j$. For necessity, if the respondent's preferences are separable, then $(a_{jk}/a_{jj}) = 0$ and $r^*(q_j \mid r_k^*) = \theta_j + \varepsilon_j$, which does not depend on r_k^*. Therefore, $r(q_j \mid r_k^*) = r(j)$. If question k contains no measurement error, then $(r_k^* - \theta_k) = 0$ and $r(q_j \mid r_k^*) = r(q_j)$. □.

7 Appendix B: Survey Questions

ABORTION: Do you think that abortion should be outlawed or kept legal? Follow-up: If outlawed, even in cases of rape or incest? If kept legal, in all cases or only in special cases such as rape or incest?

AFDC: Do you think the amount of money the government provides for low-income women and their children should go up, go down, or remain at current levels? Follow-up: Go up (down) a lot, somewhat, or a little?

CLEAN UP ENVIRONMENT: Do you think the amount of money the United States spends cleaning up the environment should go up, go down, or remain at current levels? Follow-up: Go up (down) a lot, somewhat, or a little?

POLLUTION: Do you think the amount of pollution industries are allowed to put out should go up, go down, or remain at current levels? Follow-up: Go up (down) a lot, somewhat, or a little?

IMMIGRATION: Every year the U.S. government allows a certain number of immigrants to enter the country legally. Should we allow more immigration into the United States each year, allow less immigration, or keep immigration at current levels? Follow-up: A lot more (less), somewhat more (less), or a little more (less)?

ENGLISH: Do you think the U.S. government should or should not adopt English as the national language?

SOCIAL SPENDING: Do you think the United States should spend more money on social programs, spend less money on social programs, or continue spending the same amount it does now on social programs? Follow-up: A lot more (less), somewhat more (less), or a little more (less)?

DEFENSE SPENDING: Do you think the United States should spend more money on national defense, spend less money on national defense, or continue spending the same amount it does now on national defense? Follow-up: A lot more (less), somewhat more (less), or a little more (less)?

At the beginning of the survey, interviewers instructed respondents to say "no opinion" if they did not have an opinion on an issue.

Information Questions

"Which party would you say is more liberal—the Democrats, the Republicans, or are you not sure?"

"Which party has a majority of seats in the U.S. House of Representatives—the Democrats, the Republicans, or are you not sure?"

"Do you happen to know what job or political office is now held by Al Gore?"

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