American Ambivalence Towards Abortion Policy: Development of a Heteroskedastic Probit Model of Competing Values

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*American Ambivalence Towards Abortion Policy: Development of a Heteroskedastic Probit Model of Competing Values**

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Theory: Using elaboration-likelihood models and insights from the recent core beliefs literature, we show that conflicting core beliefs lead to ambivalence about policy choices.
Hypotheses: Policy choices about abortion are heterogeneous. This heterogeneity across individuals is a function of the underlying conflict in their beliefs about the role of women and the sanctity of human life.
Methods: A heteroskedastic probit model is developed to test the hypotheses.
Results: Heterogeneity is observed for six of seven abortion policy choices; when core values conflict, respondents are more ambivalent in their policy responses and more difficult for our standard models to predict.

Important political debates involve fundamentally tough questions, where deeply held and widely shared principles or values are in conflict. Occasionally, polities arrive at consensus about how to settle difficult policy questions—when to go to war in the Persian Gulf, or when to withdraw from Viet Nam, for instance. But the most challenging questions for both political elites and mass publics occur when fundamental principles or values are conflictual, such as are the rights of choice vs. respect for life in the debate over abortion policy, the protection of timber jobs vs. the protection of endangered species, or the toleration of racist speech vs. redressing concerns of minorities. These dilemmas raise difficult choices because we value aspects of both sides of the debate. No doubt, some people have little difficulty resolving these debates, but for most of us these are hard choices. Abortion policy, the case we examine here, represents conflict between core beliefs.[1]

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[1]The models we estimate in this paper, the heteroskedastic probit model for attitudes toward abortion policy, relied upon the 1982 General Social Survey, extracted from the cumulative GSS file for 1972–91. The data were collected for the National Data Program for the Social Sciences, National Opinion Research Center, University of Chicago. The data were distributed by the Roper Center for Public Opinion Research, University of Connecticut. All estimation in this paper was conducted using SHAZAM (White 1978). The data sample used in this paper, and the full SHAZAM code (a relevant fragment of the code is given in Appendix B) are available from the authors.

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The recent scholarship on "core beliefs" has shown great promise towards identifying systems of mass beliefs. Converse (1964) documented the difficulties in finding anything like an overarching ideology in all but a scant fraction of the mass public. Instead of a single overarching ideology, recent research identifies nuggets of core beliefs around which a surprisingly rich collection of preferences appear to be structured. Feldman (1988) showed that values of equality of opportunity, economic individualism, and free enterprise went a long way toward explaining survey responses on welfare, government spending, federal activism, and support for minorities. Kinder and Sanders (1990) used split sample techniques to show how framing questions of affirmative action in terms of reverse discrimination (as opposed to undeserved advantages), were strongly related not just to questions of racial policy, but also to preferences for political candidates. Feldman and Zaller (1992a) demonstrated that both supporters and opponents of welfare policy were able to draw upon core beliefs about economics, justice, and the role of the state—most significantly, values of economic individualism. Sniderman and Piazza (1993) showed the importance of two important core values, individualism and authoritarianism, in accounting for current racial attitudes. The utility of the concept of core beliefs shows considerable promise towards understanding attitudes toward a wide range of policies, politics, and politicians.

The possibility of core beliefs in opposition to one another presents a nagging problem for understanding survey responses. Feldman and Zaller (1992b) put this problem as the "ambivalence axiom": "Most people possess opposing considerations on most issues, that is, considerations that might lead them to decide the issue either way." In combination with two further axioms (the "response axiom" and the "accessibility axiom"), Feldman and Zaller identify three related ways for checking ambivalence: counts of opposing remarks, spontaneous expressions of ambivalence or difficulty making up their minds, and counts of "two-sided" comments. They then develop a model explaining response stability, ideological consistency, and general response effects, based on the recognition of opposing considerations.

While this approach demonstrates the presence of opposing considerations (Feldman and Zaller's definition of ambivalence), it does not necessarily demonstrate underlying conflict. There are many reasons why individuals might offer two-sided evaluations. One reason is *equivocation:* respondents might be uncertain about the interviewer's reaction to his or her answer. They might offer "mushy" answers to questions (especially controversial ones), to avoid making an unfavorable impression on the interviewer. Under such circumstances, there need not be any internal conflict

on the respondent's attitudes, only conflict in expectations about the interviewer. Another reason might be *uncertainty:* the respondent knows that there may be two sides to a political debate, but is insufficiently informed to resolve the question for himself or herself. Again, the respondent need not be in conflict about the values at stake, but only lack the ability or material to decide which side he or she favors. A third reason is *ambiguity of the questions:* respondents might hold firm and fixed opinions on the values at stake, but the questions themselves inadequately elicit those values. As Achen (1975) demonstrated, both response error and measurement error might account for variation in respondent's answers over time. A fourth reason is that the respondent might be *exhibiting informedness* by citing both sides of a debate. Respondents who are well-educated and well-informed about policy questions might be able to provide the arguments of both partisans, while adhering more strongly to one, or to neither. If we expect our students to be able to "see both sides" of controversies in our classes, we should not be surprised when respondents do the same.

Conflict in core beliefs differs from these alternative explanations for two-sided answers in some significant ways. First, respondents may be certain about attitudes toward core beliefs and values, equally certain about the ramifications of those beliefs, yet find some questions difficult to answer. These respondents would appear to be identical to those who truly have no considered opinions about policy questions. Secondly, the addition of new information may not resolve the respondent's difficulty in answering the questions. Consider the specific policy problem we explore in this essay: respondents who hold strong beliefs about both women's rights and respect for human life before birth may not find it any easier to answer questions about abortion policy, the more they become aware of the intricacies of those policies. We will demonstrate both of these key differences between conflict as a source of ambiguity versus the alternative sources in our analysis of attitudes toward abortion.

We argue in this paper that in many cases *individual core beliefs* will be in conflict, not just the considerations they draw upon when formulating their survey response. When core beliefs conflict, it becomes difficult for an individual to determine their position on related policy choices. We believe this conflict on some important core beliefs may account for the uncertainty respondents report on many dimensions of public policy (e.g. Alvarez and Franklin 1994), as well as the perplexing problem of response instability (e.g. Feldman and Zaller 1992b).

So, if our suspicions are correct—that *conflict* between core beliefs makes for difficult choices and uncertain or unstable responses—then we require different methods to identify such conflict. Further, if conflict mat-

ters, then response effects become very relevant for questions of elite responsiveness to mass opinion.

Our paper develops a model of opinion on conflicting questions. In the next section of the paper we describe the conditions under which we expect to see conflict between core beliefs. This model implies, for policy questions with uncertain relationships to the underlying core beliefs, that individuals with conflicting beliefs will have more difficulty with these policy questions. In the second section of this paper, we outline a test of this implication, involving heteroskedastic probit models. There, we focus exclusively on abortion as our test case. In the last section, we close with a brief discussion of the implications of our work.

1. A Model of Conflicting Core Beliefs and Ambivalent Responses

Contemporary research on elaboration aids our understanding of the dynamics of response to specific policy questions. Under conflicting core values, we expect that the dynamics of survey response would be quite different from the circumstances where core values are in resonance, or when only one value is relevant. In one of the more important psychological models of persuasion in the last 15 years, Petty and Cacioppo (1986) unify an enormous literature into an "elaboration-likelihood model," or ELM. "... Elaboration refers to the extent to which a person scrutinizes the issue-relevant arguments contained in the persuasive communication" (Petty and Cacioppo 1986, 7). One measure of elaboration, underused in political science, is the degree to which respondents are able to elucidate answers to open-ended questions.

The ELM begins with the subject receiving a message. The subject elaborates on the message only if he or she is both able and motivated to process the communication. Subjects may have the ability to cognate a message (e.g., have the necessary technical expertise), but lack the motivation (e.g., find the subject not worth considering). An example might be the journal reader who possesses the methodological and substantive expertise to review an article, but fails to find the particular substantive contribution germane to his or her own interests. Even if the subject is either unable or not motivated to process the message, he or she may still be able to "think" about the issue at hand. In this event, the model would not expect the subject to elaborate upon the message, but to be persuaded by short-term cues or pre-existing attitudes.

If the subject fails to be either motivated or able to process and think about the communication, the subject handles the message by what Petty and Cacioppo designate the "peripheral" route to persuasion. The subject under the "peripheral" route to persuasion may be influenced more by

the subjective credibility of the speaker, the characteristics of the mode of communication, or other extrinsic aspects of communication. Messages under the "peripheral" route to persuasion are unlikely to change attitudes or behavior, and if so, rarely induce long-term change.

If the subject is able and motivated to process the communication, the subject evaluates the contents of the message. The problem of conflict between core values is one which, we argue, strikes directly at such a "central" route to persuasion. As we develop below, we can measure both "ability" and "motivation" to process messages about abortion from survey data. We also demonstrate a useful method for identifying the degree respondents are able to elaborate upon the terms by which they evaluate the appropriateness of abortion. Even when subjects are able and motivated to process the communication, and they elaborate multiple reasons for or against abortion, subjects' answers to specific policy questions may be more random than those from subjects who are unable to elaborate, or who lack ability or motivation to process the message.

In the standard ELM, the subject in the central mode of persuasion subjectively evaluates the message's credibility. When there are two conflicting values, the respondent has two grounds under which to formulate a policy choice. When there are two dimensions of evaluation, this increases the variance of the subject's choice, or the probability that despite our best understanding of the subject's interests in opting for one side or another of the debate, that our prediction will be incorrect.

In fact, the difference between one- and two-dimensions of core beliefs on the question of abortion leads to a distinction between "easy" and "hard" questions. "Easy" questions are those which involve only a single value dimension. These might be valence questions, or questions which allow a respondent to reconcile a choice because one value is "higher" than another. "Hard" questions are those where two or more value dimensions push the respondent in different directions. These are questions which may pertain to multiple beliefs, and in turn make the question difficult for the respondent to answer.[2]

While our usual focus of analysis in understanding policy questions is the respondent's choice or position on the policy, we suggest an equally informative aspect of analysis is understanding the variance of a respondent's position. This idea of respondent variance is different from the sampling idea of variance. Instead of conceptualizing variance in terms of the range of attitudes possessed by the population, we argue that respondents

[2]This is a different distinction between "hard" and "easy" issues from that made by Carmines and Stimson (1980).

themselves may possess a variance of attitudes. Respondent variance may look like measurement error, or respondent error (aka ''door-step opinions''), but stems not from the inadequacies of either instrument or respondent, but from the difficult choices we ask respondents to make.

2. Heteroskedasticity and Choice

The ELM model speaks directly to how people respond to survey questions about policy attitudes. When survey questions prompt respondents for positions on important issues, individuals are likely to evaluate their attitudes via central processing. If not, individuals are likely to process the policy peripherally, and then the survey responses obtained are not good measures of respondent attitudes.

So, for those issues evaluated centrally, a response can be easily formulated if the policy or question invokes only one core value. In those cases where multiple values are invoked, however, a response to the question is more complicated. For example, when an issue is controversial in the public, that issue likely deals with the conflict between multiple core values.

Some citizens may have resolved this conflict for themselves. That is, some in the public may not find that their underlying beliefs are conflictual, and that determining their position on a policy issue is relatively simple. These people would not be ambivalent about the issue, and we would expect their responses to survey questions about the issue to reflect this lack of ambivalence. Others, though, might find the conflict between these underlying beliefs quite profound, and that the conflict complicates their ability to determine their preferences about a particular policy. These citizens are ambivalent about the issue, and their survey responses about the policy area should reflect that ambivalence.

Ambivalence about policy choices should vary across survey respondents according to differences in the amount of value conflict, and we should observe this ambivalence in the responses of people to survey questions. If the process that causes the unequal survey response variance is not accounted for in an empirical model of the particular question, the model is likely to produce incorrect results. Moreover, the underlying variance in a respondent's answers yields direct information about the degree of certainty that a respondent has in his or her opinions. When there is the possibility that core beliefs about some policy issue conflict for some individuals, the conflicting core beliefs must be included in models of issue preferences.

Yet, the problem of unequal variance across observations is familiar to every analyst of regression models as heteroskedasticity. In the least squares regression model, if the errors are heteroskedastic, the estimator is

unbiased and consistent but is inefficient; and the typical estimate of the parameter covariance matrix is incorrect. Unfortunately, unequal variance is a worse problem for binary choice models. In the specific case of the probit model, heteroskedasticity makes the maximum likelihood estimates *inconsistent* and the estimate of the covariance matrix is incorrect (Yatchew and Griliches 1985). Therefore, if heteroskedasticity is suspected in a probit model, it must be tested for and modeled if we expect to obtain consistent estimates.

In maximum likelihood terms, the idea behind modeling dichotomous choice is to specify the systematic component of some probability (π_i) of individual i adopting the choice (y_i). In conventional probit and logit estimations, the analyst assumes that the π_i were generated by a homogeneous process, or that the data are identically and independently distributed. This permits the analyst to write the likelihood function in a relatively simple form:

$$\log L(\pi|y) = \sum_{i=1}^{N} y_i \log \pi_i + (1 - y_i) \log(1 - \pi_i) \tag{1}$$

(Where π_i is reparameterized as a function [usually a normal or logistic function] of a set of explanatory variables.) Our argument is that preferences for various abortion policy choices are *not* identically distributed, but that the process of generating responses to abortion policy choices is heterogeneous. Respondents who are able to elaborate on both reasons to oppose and support abortion have a wider underlying distribution of choices than those who express one-sided elaborations. This means that the standard probit (Equation 1) will yield inconsistent estimates (see Greene 1993, 649–50).

We can address this source of inconsistency by modeling the heterogeneity. A plausible choice for the functional form of the heterogeneity is a variation of Harvey's "multiplicative heteroskedasticity" approach (1976):

$$y_i^* = X_i\beta + \varepsilon_i \tag{2}$$

$$\text{var}(\varepsilon_i) = \exp(Z_i\gamma)^2$$

where y_i^* is a binary response to the policy question, X_i and Z_i are matrices of independent variables, ε_i is an error term and β and γ are coefficient vectors to estimate. The first equation is a model of choice, in which a person's policy beliefs are a linear combination of interests leading the

respondent to opt for a particular choice. (In this equation, we will also add a set of control variables which allow us to obtain accurate estimates about the effects of the core beliefs on preferences and to test alternative hypotheses about what determines particular policy preferences). The second equation is a model for the error variance, where we introduce variables accounting for alternative explanations (the multiplicative heteroskedasticity idea). This means that the systematic component now describes an identically distributed process for π_i^*:

$$\pi_i^* = g\left(\frac{X_i\beta}{\exp(Z_i\gamma)}\right) \tag{3}$$

where $g(\ )$ is an appropriate link function bounded between zero and one such as the logistic or normal; in this paper, we use the normal distribution ($\Phi(\ )$).[3]

This leads to a log-likelihood function very similar to the usual probit log-likelihood:

$$\log L = \sum_i \left(y_i \log \Phi\left(\frac{X_i\beta}{\exp(Z_i\gamma)}\right) - (1 - y_i) \log\left[1 - \Phi\left(\frac{X_i\beta}{\exp(Z_i\gamma)}\right)\right]\right) \tag{4}$$

The significant difference between the likelihood above and the conventional probit is the inclusion of the variance model in the denominator in Equation 4. In practice, statistical packages like GAUSS or SHAZAM can easily be used to estimate the heteroskedastic probit model. In this paper, we used SHAZAM's non-linear procedure to estimate our models, and a fragment of the relevant computer code is given in Appendix B.

Fortunately, our prediction of heterogenous responses to abortion policy questions can be formulated as a statistical test; so we test for the presence of heteroskedasticity in our models of abortion policy prefer-

[3]The logit function can be substituted here for a similar model (Dubin and Zeng 1991; Gerber and Lupia 1993). Another interesting application of the heteroskedastic probit model is given by Knapp and Seaks (1992).

ences using a simple likelihood ratio test (Davidson and MacKinnon 1984; Engle 1984).[4] This test compares an unrestricted model (with a fully-specified variance model, Equation 4) to a restricted model (in which homoskedasticity is assumed, Equation 1). The null hypothesis is that the error variances are homoskedastic (i.e., that $\gamma = 0$), indicating that an ordinary probit will suffice. The alternative is that at least one γ is not zero. Let L_0 be the log likelihood for the restricted (homoskedastic) probit, L_H be the log likelihood for the unrestricted (heteroskedastic) probit, and k be the number of γ_i coefficients in the variance portion of the model. Then the likelihood ratio

$$LR = 2 \times (L_H - L_0) \tag{5}$$

is distributed as a χ^2 with k degrees of freedom.[5] If we can not reject the null hypothesis that the error variances are homoskedastic (i.e., that $\gamma = 0$), then an ordinary probit will suffice. Below, we demonstrate that one can reject a null of homoskedasticity for 6 of the 7 questions.[6] We turn now to an explication of our model.

3. Attitudes Toward Abortion

Abortion remains one of the most conflictual issues in American politics, figuring prominently in public debates, personal moral choices, as well as in state and national elections for many political offices. It is also an excellent place to test our model for a number of reasons. First, there are clear and well-known "core beliefs" which form the bases of abortion policy preferences (Luker 1984; Ginsburg 1989). Second, abortion is one

[4]There are two other tests for heteroskedasticity in the binary choice framework—the Lagrange multiplier and Wald test statistics. We use the likelihood ratio test here since it is most familiar to political scientists, since we have a theoretical specification for the variance function and since we have a strong interest in estimating the parameters in γ. Also they are asymptotically equivalent tests (Engle 1984).

[5]Davidson and MacKinnon (1984) demonstrate through Monte Carlo simulations that this LR test falsely rejects the null in less than 1% of the replications at the $p < .01$ level, with only 500 observations in each replication. With the greater number of observations in our sample, Davidson and MacKinnon's findings suggest even greater power in our application of the LR test.

[6]All tests for heteroskedasticity are sensitive to model misspecification (Davidson and MacKinnon 1984). In fact, an alternative approach to heteroskedasticity is to regard it as a problem of misspecified functional form, and to incorporate a series of interactive terms into the model. For testing our model, though, the variance function is of intrinsic interest, and is a function of understandable parameters. Estimating the variance function, moreover, is a direct test of our argument.

of few issues upon which people have such strongly held beliefs (Alvarez and Franklin 1994). This makes it less likely that our results could be influenced by some of the confounding problems we noted earlier—equivocation and uncertainty. Third, abortion has been and continues to be a polarizing issue in American politics (Abramson, Aldrich and Rohde 1994, 189–91). Last, abortion policy preferences are argued to be based on multiple, and possible conflictual, core beliefs (Craig and O'Brien 1993; Rodman, Sarvis and Bonai 1987). In this section of the paper, we look at how conflicting core beliefs influence individual preferences about various abortion policy choices.

The General Social Survey has long included a complex battery of questions on abortion. Instead of asking respondents to choose among a limited set of options, the GSS battery asks respondents whether they believe abortion should be allowed under any of seven circumstances, for each scenario separately. The question reads, "Please tell me whether or not *you* think it should be possible for a pregnant woman to obtain a *legal* abortion . . ."

- If there is a strong chance of serious defect in the baby?
- If she is married and does not want any more children?
- If the woman's own health is seriously endangered by the pregnancy?
- If the family has a very low income and cannot afford any more children?
- If she became pregnant as a result of rape?
- If she is not married and does not want to marry the man?
- The woman wants it for any reason?

In terms of the difficult policy choices facing elected officials, the GSS battery comes close to the actual decisions they would have to face. The GSS battery thus makes for an excellent opportunity to test our arguments about the role of conflicting core beliefs and values in producing ambivalent response.

3.1 An Empirical Model of Ambivalent Abortion Attitudes

There are two steps to development of a model of ambivalent attitudes toward abortion. The first part of our model, the choice model, estimates levels of support for abortion rights under each of the seven scenarios. For the development of this model, we draw from the burgeoning literature on abortion attitudes. In order to accumulate sufficient variables to test this model, we use the 1982 GSS.[7]

[7]Specifically, we use both the base 1982 General Social Survey, as well as the oversample of black respondents. We obtain substantively identical results by using only the base 1982 GSS. Because the literature leads us to expect that black respondents are more

Luker (1984) describes the conflict in attitudes towards abortion as stemming from fundamental conceptions of the role of women. While direct questions about women's roles would be especially useful, we lack such direct measures for the particular years of the GSS question. We do, however, have a measure of support for the ERA. By the later years of the campaign by pro-ERA activists, many of these activists explicitly linked support for the ERA with abortion rights (see Mansbridge 1986, 122–28). We include *ERA Support,* the response to the question "Do you strongly favor, somewhat favor, somewhat oppose, or strongly oppose this amendment?" *ERA Support* is scaled from 0 (strongly oppose) to 1 (strongly support).

Luker (1984) also found that religion remained a significant contributor to pro-life activism. We include several measures: *Catholic* is a dummy variable denoting whether the respondent is a Catholic; *Attend Church* records the frequency with which the respondent attends church, scaled from 0 (never) to 8 (several times a week); *Religious Intensity* records whether the respondent expressed a strong religious intensity, scaled from 0 (not religious) to 1 (very strong religious preference).[8]

We include two dummy variables for race and gender: *Black* and *Male.* Black Americans have had persistently stronger opposition to abortion than whites, even after controlling for religion, education, social status, and region (Combs and Welch 1982; Hall and Ferree 1986; Brehm 1993). Gender has not had a convincingly consistent relationship with abortion attitudes, even though some activists see abortion policy as a question of women's rights.

The second half of our model estimates the error variance in the binary choice part of the model. Our basic argument is that individuals who possess strong attachments to both of the underlying core principles should have a harder time making a decision about abortion; hence they should have a greater error variance. By what we know from the ELM, we need measures for the respondents' motivation and ability to process the communication, and the degree that the respondents evaluate the policy choice under both pro-life and pro-choice dimensions.

There are two aspects of a respondent's "motivation" to process the

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likely to oppose abortion than white respondents, even after other controls, we opt to include the oversample. More detailed discussion of the variales used in our analysis is in Appendix A.

[8]There are several possible operationalizations of religious intensity and activism. One such variation is an interaction between religious intensity and Catholicism, in an attempt to capture the diversity in pro-life attitudes among Catholics (i.e., that Catholic activists are pro-life, but not Catholics in general). This interaction effect materialized in only one of the seven models (birth defect).

information about abortion: respondent commitment to a prior position, and the respondents' self-identification of the prominence of the issue. Respondents may say that they are "firm" in their opinions about abortion; under ordinary circumstances, one would expect these respondents to have less underlying variance to their positions. When both pro-choice and pro-life positions are salient to the respondent, then the more "firm" a respondent professes to be, the more the respondents' answers will be sensitive to the context of the choice. We include *Firmness of opinion* as one of two measures of motivation, where respondents' answers are scaled from 0 for those who are "very likely to change" opinions, through 1 for those who are "very unlikely" to change. An alternative aspect of "motivation" is the respondent's self-assessment of the importance of the issue. Respondents who say that abortion is not important at all would be unmotivated to process any communications about abortion, whereas respondents who say that abortion is the most important issue would be highly motivated. We include *Abortion Importance* as a variable scaled from 0 (not important at all) through 1 (most important).

We measure the ability of respondents to process the communication by the respondents' self-report about their level of information on the issue on abortion. There are some glaring weaknesses in using the respondents' self-report here: respondents will be inclined to exaggerate their level of informedness, and information does not directly represent ability to understand the information. The respondent's assessment nonetheless, of whether he or she has enough information is a useful indicator. We code *Abortion Info* on a scale from 0 (very little information) through 1 (all the information).

Beyond the usefulness of information as a measure of ability, the self-report of informedness highlights a significant difference between ambivalence as a source for error variance and the alternative explanations of the role that information plays in resolving conflict. Under three of the alternatives (uncertainty, ambiguous questions, and the desire to appear informed), we expect the error variance to be less for those respondents who are better informed about abortion policy than those who are relatively uninformed. Under both equivocality and ambivalence, we expect that additional information should not account for any change in the error for respondent's policy choice. The GSS also asked respondents how much information they had on the abortion debate, how firm their opinions were about abortion, and how important the problem of abortion is to them. We include measures for all three of these in the error variance part of the model. Note that one would probably not expect strength of opinions on abortion to affect the direction of support, but instead to affect the difficulty respondents have in stating their position.

The third aspect of the variance model is the degree to which the respondent has cognated information about abortion. One way of noting whether the respondent has actually thought about both of the core principles is to ask the respondent to elaborate on the reasons for and against abortion. The 1982 GSS asked, in an open-ended question, for the respondents to state reasons both for and against abortion. We include both *Pro Count* and *Con Count*, which are simply counts of the number of reasons for and against. Since we are arguing that the simultaneous presence of both attitudes should increase error variance, we look toward the product of the two.

Some inspection of the actual reasons offered by the respondents in answer to this question is worthwhile. Under the reasons for abortion, the preponderant answers included (in order of frequency) "end pregnancy due to rape," "prevent an unwanted child," "freedom of choice/ right to choose," "danger to mother's health," "parents cannot afford child," and "prevent defective child." These answers accounted for approximately three-fourths of the mentions. Under the reasons to oppose abortion, the preponderant answers were "abortions are killing," "taking a life," "religion, general," "right to life," "morality," and "unborn alive." These answers accounted for over 80% of the mentions. Although other reasons to oppose abortion may attract some media attention (e.g., genocide), such reasons were not among those frequently mentioned by the respondents.

How common are conflictual attitudes toward abortion? Quite common as it turns out. Measured in terms of the reasons respondents were able to offer on both sides of the debate, the majority of the respondents to the survey expressed some degree of conflict over abortion. The vast majority (94%) of the respondents were able to provide at least one reason for or against abortion. Most of the elaborations were two-sided to at least some degree. Of the respondents who provided at least one reason to oppose abortion, 89% were also able to provide at least one reason to support abortion. Conversely, of the respondents who were able to provide at least one reason to support abortion, 94% were able to provide at least one reason to oppose abortion.

One could look at the marginals supporting each of the questions, and wonder whether those who would ban abortion under all circumstances (9.6% would ban under "mother's health"), or those who would permit abortion for any reason (38.5%), and ask whether they are in a state of conflict. True, these categories of respondents seem to have fixed rules about the appropriateness or not of abortion policy. But it would be a mistake to assume that these respondents reach these fixed rules without elaboration of both sides of the abortion debate. More than

half of the respondents (57.5%) who forbade abortion, even when the mother's health was in jeopardy, could provide at least one reason to permit abortion. Nearly nine in ten (88.5%) of the respondents who would permit abortion for any reason could provide at least one reason to oppose abortion.

Respondents could be able to rehearse both the reasons for and against abortion without being in a state of conflict about the policy (for the reasons of uncertainty, equivocality, ambiguity of the questions, or a desire to appear informed). Under equivocality, we would expect that respondents who are able to rehearse both positive and negative reasons for abortion policy should in all cases have greater error variance than those who rehearse only one side of the question. Those respondents who rehearse both sides of the question because they are well-informed about the terms in the political debate (or have a desire to appear so) should have less error variance throughout. Our argument will be that ambivalent respondents should have greater error variance for the "difficult" policy questions and less error variance for the "easy" questions than respondents who do not elaborate both sides.

3.2 Results from the Heteroskedastic Probit Models

We estimate the heteroskedastic probit model for each of the seven indicators of attitudes toward abortion, and report the results of these estimates in Table 1. We order the estimates for the seven different indicators by the percentage of respondents in the 1982 GSS who answered "yes" to each question. (The percent answering "yes" appears in the first line of numbers in the table). Note that three of the questions elicit overwhelming support from the GSS respondents: "mothers' health" (90.4%), "rape" (83.9%), and "birth defect" (82.1%). None of the remaining four questions obtains a majority supporting abortion under the specific circumstance.

This initial observation is extremely useful for the present analysis. The pattern of support for the seven different alternative scenarios closely follows the historical record of legal abortion in the United States. Protection of the life of the mother has always been a component of abortion law. The first laws restricting the availability of abortion in the United States included explicit exemptions intended to protect the mothers' health (Ginsburg 1982). If there is ever something approximating an "easy" or "valence" question about abortion, it is to permit legal abortions when the life of the mother is in jeopardy. Likewise, the subsequent history of the expanding set of permitted circumstances for abortion moved rapidly to include probable birth defects. Ginsburg (1989)

Table 1. Heteroskedastic Probit Estimates of Attitudes Toward Abortion Policy, 1982 General Social Survey

	Mothers' Health	Rape	Birth Defect	Too Poor	No More Children	Single	Any Reason
Percent Yes	90.4	83.9	82.1	49.0	45.8	45.5	38.5
Choice Model							
Constant	2.55	1.92	2.02	.02	.03	.11	−.07
	(.46)	(.40)	(.40)	(.01)	(.08)	(.09)	(.13)
Black	−.51	−.47	−.54	−.09	−.11	−.23	−.15
	(.14)	(.13)	(.15)	(.06)	(.06)	(.10)	(.09)
Male	−.08	−.20	−.21	−.04	−.02	−.06	−.13
	(.11)	(.09)	(.11)	(.04)	(.03)	(.05)	(.07)
Catholic	−.52	−.15	−.33	.01	.02	−.03	.05
	(.13)	(.10)	(.12)	(.04)	(.04)	(.04)	(.07)
Religious Intensity	−.39	−.17	−.51	−.17	−.13	−.18	−.22
	(.20)	(.14)	(.19)	(.10)	(.69)	(.09)	(.12)
Attend Church	−1.04	−.99	−.91	−.35	−.43	−.47	−.79
	(.25)	(.23)	(.24)	(.17)	(.17)	(.20)	(.26)
Know What ERA Means	−.18	−.14	.01	.10	.09	.09	.12
	(.17)	(.15)	(.16)	(.08)	(.07)	(.08)	(.10)
Support ERA	.33	.12	.40	.22	.31	.31	.51
	(.17)	(.14)	(.18)	(.12)	(.13)	(.13)	(.17)
Variance Model							
Pro Count	−.14	−.19	−.06	−.25	−.26	−.34	−.22
	(.07)	(.09)	(.08)	(.22)	(.18)	(.17)	(.15)
Con Count	.17	.20	.37	−.50	−.58	−.41	−.48
	(.09)	(.12)	(.12)	(.19)	(.17)	(.16)	(.14)
Pro Count × Con Count	−.44	−.03	−.09	.19	.25	.21	.22
	(.04)	(.05)	(.05)	(.11)	(.09)	(.08)	(.08)
Importance	.51	.17	−.14	−.16	−.18	−.24	−.30
	(.15)	(.15)	(.16)	(.31)	(.26)	(.25)	(.25)
Information	.37	−.13	.05	−.32	−.28	−.28	.68
	(.13)	(.14)	(.14)	(.29)	(.25)	(.24)	(.23)
Firmness of Opinion	−.37	−.58	−.61	.60	.47	1.81	.63
	(.16)	(.17)	(.16)	(.58)	(.43)	(.67)	(.38)
Heteroskedasticity Test							
Likelihood Ratio Test ($\chi^2_{df=1}$)	47.4†	46.7†	41.2†	12.5	19.9†	27.2†	25.9†
N	1312	1302	1294	1291	1289	1293	1295
Goodness of Fit ($\chi^2_{df=13}$)	126.12†	173.66†	181.29†	142.30†	182.86†	193.54†	180.86†

Note: Standard errors are in parentheses below coefficients. †indicates a χ^2 significant at the $p \leq .05$ level.

describes the emergence of abortion under circumstances other than for the health of the mother with the terrible Rubella epidemics of the late 1950s and early 1960s, and the horrific birth defects from thalidomide poisoning. These disasters led to more relaxed laws permitting so-called ''therapeutic'' abortions.

We will refer to the first three settings (''mothers' health,'' ''rape,'' and ''birth defect'') as the ''easy'' abortion questions, and the remaining four as ''difficult'' ones. Furthermore, we will demonstrate below that it is only under the difficult abortion questions that two-sided elaboration leads to greater variance in the individual respondents' probability of support. As we argued above, the difference between ''easy'' and ''difficult'' questions is that under difficult questions, values are in conflict, whereas under easy questions, values are either non-conflictual or subordinated.

We begin with the choice component of these models. Note that the findings of the general literature on attitudes toward abortion policy remain entirely intact. Black respondents were more likely to oppose abortion under all seven of the scenarios: the coefficient on *Black* is always negative, and in all but one case (''too poor''), the coefficient is statistically significant. The puzzle of strong black opposition to abortion remains confirmed in our estimates here.

Men are always more inclined to oppose abortion under all seven alternatives, but the estimates are not statistically significant in four of the seven cases (''mothers' health,'' ''too poor,'' ''no more children,'' and ''single''). While there might be some interest in the relationship of gender to attitudes about abortion, the evidence here is that gender is not an overwhelming or consistent predictor of such attitudes.

Religiosity clearly affects attitudes toward abortion, and in significant ways. Being Catholic is not the best reflection of religiosity as it pertains to abortion, however. The coefficient on *Catholic* is of inconsistent sign across the seven models, and statistically distinguishable from zero in only two of those cases (''mothers' health'' and ''birth defect''). *Religious Intensity* is consistently negative: those who have strong religious preferences are more likely to reject abortion under all seven scenarios, and to a statistically significant degree in all but two of those cases (''rape'' and ''no more children''). Frequency of attending church turns out to be the strongest measure in the model. The coefficient is always negative, always statistically significant. Note also that this is the only variable whose scale runs from 0 to 8 (instead of 0 to 1), so that at its maximum range, it has a powerful effect undermining support for abortion.

Mere knowledge of the ERA has no influence on support for abortion—in no case were the coefficients on knowledge of the ERA significant,

and the estimated coefficient does change sign across policy scenarios. Support for the ERA, however, is a powerful predictor of support for abortion rights in all but one of the scenarios (''rape'').

We think the foregoing findings are useful in and of themselves, since they demonstrate the many bases of attitudes towards abortion and point to possible sources of conflict. The most intriguing aspect of the problem arises in the variance model. First, notice that of the seven probit models we estimated, only the likelihood ratio test for the ''too poor'' does not exceed the critical χ^2 value of 16.8 (at $p < .01$), barely missing the value of 12.6 (at $p < .05$).[9] The remaining six models, though, show strong evidence of heteroskedasticity.

The goodness-of-fit for every one of the heteroskedastic probit models vastly exceeds the critical value of 27.7 ($p < .01$). There is considerable controversy among statisticians, econometricians, and political scientists about the appropriate goodness-of-fit for choice models (e.g., Greene 1994, 651–52; Amemiya 1981). The problem of selecting a predictive success measure is acute in skewed distributions. The ''naive model'' (simply selecting the preponderantly favored option) is correct 90% of the time in the ''mother's health'' scenario. Following the usual conventions for generating predicted choices of letting all predicted probabilities over .5 become 1 and all below .5 become 0, it is highly unlikely that any substantive model could improve upon the predictions of the naive model when the data are so skewed. One could shift the cutoff from .5, but only at the cost of increasing the probability of Type II errors. Moreover, because the distributions of choices range from skewed in favor, to symmetric, to skewed in opposition, there are no grounds for choosing a single cutoff across the seven models. We choose the likelihood ratio test since it is a direct test that the increase in the likelihood is due to the choice of variables in the systematic component (choice and variance models), not just due to sampling error (King 1989, 84–86).

We want to draw particular attention to the coefficient on the interaction term between the number of reasons offered for and against abortion. Respondents who are experiencing ambivalence and can give both positive and negative mentions about abortion should be more difficult for the standard probit approach to estimate, under some circumstances. In the case of support for abortion when the mother's health is in danger, being able to give both positive and negative reasons decreased the error variance, and to a statistically significant degree. We argued above that the health of the mother is the ''easiest'' waiver for respondents to grant for abortion

[9]However, the ''too poor'' model does exceed the p = .10 critical threshold of 10.6.

rights. In the terms of our story about ambivalence, the ambiguity about the problem of respecting human life might make this a relatively straightforward—if wrenching—decision for respondents to make.

In the present model, the interaction terms are negative, but not statistically significant at conventional levels. The implication is that being able to rehearse both positive and negative mentions decreased the error variance, but only slightly so. In each of the remaining four models, the coefficient on the interaction term is positive, and statistically significant (although only at $p < .10$ for "too poor"). That is, the error variances for respondents who could express both reasons for and against abortion were consistently greater. Notice also that these are the four abortion policy choices which we classified as "difficult," and difficult questions about abortion policy clearly lead to greater variance in the individual respondents' probabilities of policy support. We take this result to be strong evidence of the effect of conflicting beliefs on ambivalent attitudes toward abortion policy.

Other coefficients in the error variance model are worthy of comment. First, an identical story can be told for the effect of firmness of opinion on ambivalent response. Respondents with firm opinions about abortion appeared less ambivalent under the first three scenarios, but more ambivalent under the more problematic reasons to grant exceptions for abortion. Also, the effect of being able to rehearse a reason favoring abortion in every case decreased the error variance. In other words, those respondents who could express positive reasons were less likely to be ambivalent, all other things held equal. Being able to recite reasons against abortion increased ambivalence under the three "easy" abortion waivers, but decreased ambivalence under the harder waivers. This is further indication of how conflicting values presents a significant problem, in this case, for pro-life respondents under conditions of threats to the mother's health, rape, or birth defects. Note that the importance of the question of abortion rights to the respondent was statistically distinguishable from zero in one scenario only ("mother's health"), and that it tended to increase ambivalence, rather than to decrease it.

One distinguishing feature of ambivalence in contrast to uncertainty is that additional information should reduce uncertainty but it need not reduce ambivalence. This feature of ambivalence stands out in the heteroskedastic probit analysis. In general, the effect of informedness on error variance is statistically indistinguishable from zero. In two of the cases, respondents who felt well informed about abortion were *more* ambivalent under the two extreme positions ("mother's health" and "any reason").

Ambivalence rooted in conflict is the only one of the alternative explanations for an ability to recite both reasons for and against abortion policy

that is consistent with all seven models. According to the (definitional) distinction between uncertainty and ambivalence, additional information might reduce uncertainty, but leave the problem equally ambiguous. The more that the respondent is informed *increases* the variance in two of the settings (for mother's health and for any reason). In the remaining five scenarios, additional information does not reduce error variance to a statistical significant degree. Uncertainty cannot be an explanation for the variation in the respondent's attitudes.

Likewise, a desire to appear to be better informed cannot play a role in all seven models since elaboration of both positive and negative reasons increases variance under the harder questions. If the respondents were performing for the interviewer by demonstrating an ability to recite both sides of the debate, we would expect that the sign on the interaction term would be negative in all cases. Under this alternative explanation, respondents who were able to recite both sides of the debate should have less variance.

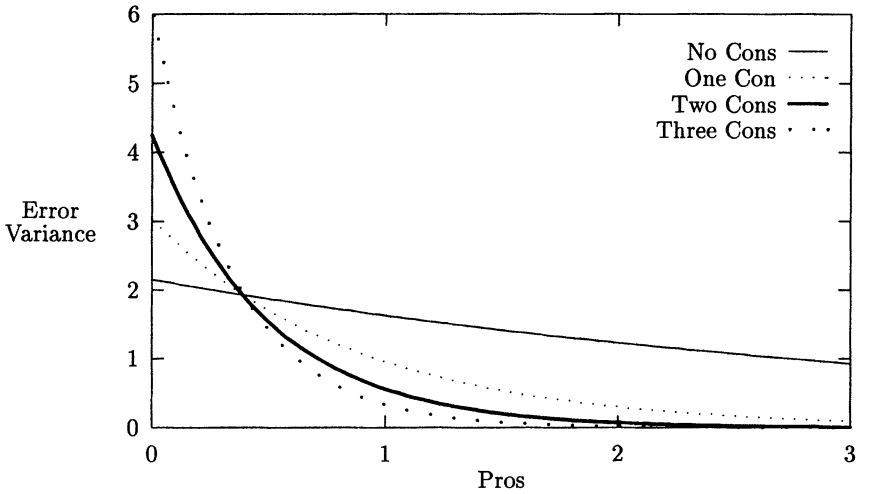
Equivocality (''mushy'' answers) cannot explain all seven models since in the ''easiest'' questions about abortion policy elaboration of negative and positive reasons decreases error variance. Under one question, the ability to elaborate on both positive and negative reasons decreases the error variance (''mothers' health''). Under three of the questions (''mothers' health,'' ''rape,'' and ''birth defect''), the more firmly the respondent holds his or her opinion, the less error variance. If the reason for two-sided answers was that the respondents had a difficult time providing clear answers to these difficult choices, we would expect that the ability to provide positive and negative reasons would consistently increase error variance in the model.

3.3 Magnitude of the Effects on Error Variance

Rather than simply examining the direction and statistical significance of the interaction between the expression of reasons for and against abortion, we can look at the magnitude of these effects. We do this by plotting the estimated error variance of each policy choice across the possible combinations of reasons for and against abortion, holding the other variables in the variance models constant at their mean values.[10] The horizontal axis in each graph counts the number of reasons in favor of legal abortion (''Pros''), from 0 to 3 mentions. There are four curves on each graph, each indicating increasing numbers of reasons in opposition to legal abortion.

[10]These models were chosen since they give interesting examples of the results from all of the models. Other identical graphs for the remaining policy choice models are available from the authors.

Figure 1. Error Variance from Mother's Health Model



Note: From estimates in Table 1. Each line gives the predicted policy error variance for an individual with varying levels of value conflict.

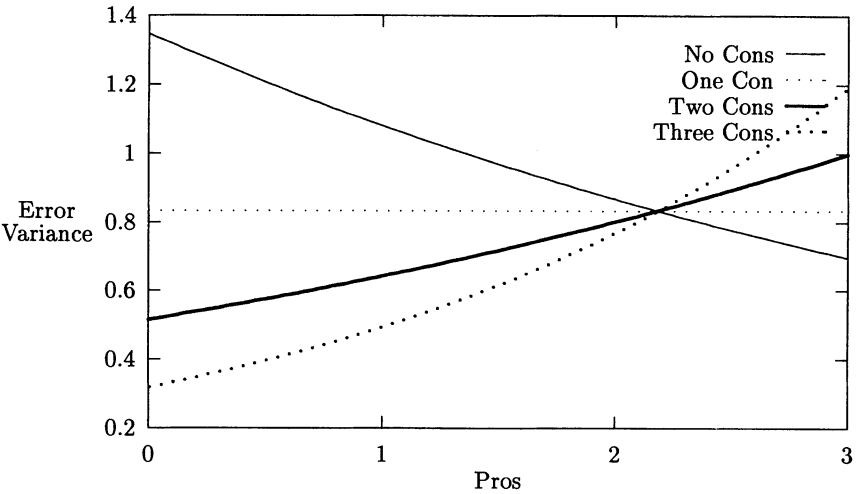
The degree to which respondents offer one-sided elaborations appears in the "No Cons" line (for positive elaborations), and across the four lines at the point of zero "pros" (for negative elaborations). The highest degree of two-sided elaboration appears in the "Three Cons" line for increasing "pros."

We begin with an illustration from the three variance models in which the estimated interaction between reasons for and against abortion were negative in the variance model. We choose "Mother's Health," although the pattern is substantively the same for "Rape" and "Birth Defect."

In Figure 1, there are a number of interesting patterns to notice. First, no matter what the number of arguments against abortion an average person might have, the estimated error variance in their preference for the particular policy (their ambivalence about the policy) decreases as the number of positive statements increases. In other words, the more that respondents provide reasons to support legal abortion in these first three scenarios, the more certain those respondents are in their choices about the appropriateness of legal abortion.

Second, respondents who elaborate on both sides of the debate (3 pros

Figure 2. Error Variance from Any Reason Model



Note: From estimates in Table 1. Each line gives the predicted policy error variance for an individual with varying levels of value conflict.

and 3 cons) have the *lowest* error variance. Even though respondents are able to elucidate reasons for and against legal abortion, these respondents are the least ambivalent in their support or opposition to legal abortion when the mother's health is in danger.

The patterns are strikingly different when we turn to the questions which fail to elicit majority support. We produce a same plot of the error variance calculations in Figure 2 for "Any Reason." (This plot is substantively the same as equivalent plots for "No More Children," "Too Poor," and "Single.") The most significant difference between this plot (a "difficult" question) and the previous plot (an "easy" question) is that one-sided elaborations decrease error variance, whereas two-sided elaborations increase variance.

There are two ways to identify one-sided elaborations, depending on whether the respondent provides reasons for or against abortion. Respondents who only provide reasons to support legal abortion appear in the "No Cons" curve in Figure 2 (thin black line). This curve is downward sloping, indicating that error variance decreases as the respondent provides further elaboration. Respondents who only provide reasons to oppose legal abortion move from the "No Cons" curve to the "Three Cons" curve at the

level of zero "pros." For every additional reason against abortion, the error variance decreases. In other words, the more respondents elaborate on one side of the abortion debate, the more certain their choices are across each of the four "difficult" abortion questions.

The opposite picture emerges when we look at respondents who are able to elaborate on both sides of the abortion debate. As the number of "cons" increases, the slope becomes steeper (more positive). In fact, for each of the four "difficult" questions, the slope of the estimated variance is *positive* for respondents who mention two or three reasons to oppose legal abortion. Unequivocally, the effect of two-sided elaboration under the "difficult" abortion questions is to increase the error variance, or to make respondents less certain in their support for or opposition to abortion under these four scenarios.

In conclusion, the findings from these heteroskedastic probit models are entirely consistent with our arguments about ambivalence arising from conflicting core values. When core values are of equal weight, and a policy equally implicates both, then the respondents are more ambivalent in their responses and harder for our standard models to predict. Only when there is some asymmetry in the implications of the policy for the principles will respondents appear less ambivalent.

4. Discussion

We have demonstrated that the attitudes of American citizens toward abortion policy are rooted in conflicting core beliefs. This is especially true for the more "difficult" abortion policy questions—policy issues which have historically been areas of great political conflict. Clearly, to understand attitudes toward abortion policy in the United States, one must understand the core beliefs which constitute the foundations of these attitudes.

To expand our approach into other dimensions of public opinion, however, much work needs to be done. First, we need to focus attention on the development and testing of survey questions which can better measure the core beliefs underpinning particular policy choices. While our use of the ELM framework does allow for the operationalization of indirect measures of the elaboration of core beliefs, more direct measurement is needed. Second, while our understandings of core beliefs are still developing, we need more knowledge of how core beliefs interact to produce policy preferences. Our theoretical model relying on cognitive balancing and ELM is a step in that direction, and clearly more attention needs to be devoted to theoretical development.

Our model has broad ramifications for many problems in public opin-

ion research. If "core beliefs" now constitute the most promising opportunity to identify consistency in mass beliefs, the most significant research problem is to come up with a theory that explains how core beliefs fit together. Our model steps in the direction of that research problem: we predict explicitly the results of the presence of two relevant core beliefs in the domain of a specific policy question, and have an empirical test to boot. The primary implication we tested here, that individuals with conflicting abortion principles have greater error variances in their responses to many abortion policy questions, has direct linkages to the growing literature on imperfect information in political behavior (Alvarez 1992; Alvarez and Franklin 1994; Bartels 1986; Franklin 1991; Page 1978). For our model implies that individuals with conflicting core beliefs may report more "uncertain" opinions about their policy positions.

Additionally, our model has implications for the literature on the survey response (Achen 1975; Feldman and Zaller 1992b). Individuals with conflicting core beliefs may respond to survey questions differently than those with consistent core beliefs. This also means that we may shed some new light on the perplexing question of response temporal instability. Given that those with conflicting core principles might be quite sensitive to changes in question wording, it is also possible that their responses to the same questions may be volatile in panel formats. If their core beliefs collide, making their policy preferences relatively ambivalent, respondents may exhibit a greater tendency to give different answers to the same question across repeated interviews.

Our work ratifies a now common finding (Craig and O'Brien 1993; Guth et al. 1993; Rodman et al. 1987), about the abortion debate in the broader realm: neither the pro-life (e.g., Operation Rescue and National Right to Life Committee) nor the pro-choice (e.g., National Abortion Rights Action League) activists represent the policy preferences of the majority of respondents to the present survey. The policy positions of the activists are unequivocal, and one-sided in support for or opposition to abortion. What we have demonstrated is that ambivalence and internal conflict reign over the four most difficult policy scenarios explored in this particular survey. Ironically, the most recent Supreme Court decision, *Casey v. Planned Parenthood,* may have come closest to the preferences of the public by sustaining both *Roe v. Wade* (and the possibility of legal abortion under certain circumstances) as well as *Webster v. Reproductive Health Services* (which permitted significant restrictions on the availability of abortion to minors).

In the more general context of elites and mass interaction, our work leads us to question the political significance of conflicting core beliefs.

What if elites sense the underlying conflict between core principles? This may mean that to influence mass opinion on a certain policy choice, elites will either try to intensify the conflict between the principles, or that they may try to eliminate the conflict for many individuals. An example of such a process may be the issue of racial desegregation during the 1960's (e.g., Carmines and Stimson 1989). Another way to look at the dramatic changes in elite behavior and public opinion about this issue during this period is that for an important segment of the public, their core beliefs about civil rights and equality may have been influenced by the changing positions of key elites and the political parties on the issue of desegregation. Certainly other examples of similar elite behavior exist.

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APPENDIX A: CODING OF VARIABLES

Abortion Policy—The question text read "Please tell me whether or not *you* think it should be possible for a pregnant woman to obtain a *legal* abortion if. . ." (READ EACH STATEMENT, AND CIRCLE ONE CODE FOR EACH. "(A) If there is a strong chance of serious defect in the baby? (B) If she is married and does not want any more children? (C) If the woman's own health is seriously endangered by the pregnancy? (D) If the family has a very low income and cannot afford any more children? (E) If she became pregnant as a result of rape? (F) If she is not married and does not want to marry the man? (G) The woman wants it for any reason?" We coded the responses into seven dummy variables, with answers of 'yes' coded 1, 'no' coded 0, all other values set to missing data.

Black—This dummy variable was coded 1 if the respondent was black, 0 otherwise. [Mean = .26; standard deviation = .44.]

Male—This dummy variable was coded 1 if the respondent was male, 0 otherwise. [Mean = .40; standard deviation = .49.]

Catholic—This dummy variable was coded 1 if the respondent was a Catholic, 0 otherwise. Religious preference was determined by the following question, "What is your religious preference? Is it Protestant, Catholic, Jewish, some other religion, or no religion?" [Mean = .24; standard deviation = .43.]

Religious Intensity—This variable was coded from the followup question to religious preference, "Would you call yourself a strong (PREFERENCE NAMED) or a not very strong (PREFERENCE NAMED)?" This variable was set to 1 for strong preference, .67 for not very strong preference, .33 for somewhat strong preference, and 0 for no religious preference. [Mean = .67; standard deviation = .32.]

Attend Church—This variable was coded from the question "How often do you attend religious services?" with codes 0 (never), 1 (less than once a year),

2 (about once or twice a year), 3 (several times a year), 4 (about once a month), 5 (2–3 times a month), 6 (nearly every week), 7 (every week), and 8 (several times a week). [Mean = .53; standard deviation = .32.]

ERA Means—This variable was coded from the question "Do you understand what the Equal Rights Amendment means?" with yes coded as 1, no coded as 0, all others as missing data. [Mean = .70; standard deviation = .31.]

ERA Support—This variable was coded from the question "Do you strongly favor, somewhat favor, somewhat oppose, or strongly oppose this amendment?" with the codes 1 (strongly favor), .67 (somewhat favor), .33 (somewhat oppose), and 0 (strongly oppose). All other responses were missing data. [Mean = .64; standard deviation = .30.]

Pro Count—This variable was coded from the question "As far as you've heard what are the main arguments *in favor* of abortions?" with the value being the number of reasons offered by the respondent. [Mean = 1.79; standard deviation = 1.04.]

Con Count—This variable was coded from "And, as far as you've heard, what are the main arguments *against* abortion?" with the value being the number of reasons offered by the respondent. [Mean = 1.59; standard deviation = .87.]

Abortion Importance—This variable was coded from "How important is the abortion issue to you—would you say it is one of the most important, important, not very important, or not important at all?" Codes were 1 (most important), .67 (important), .33 (not very important), and 0 (not important at all). [Mean = .52; standard deviation = .29.]

Abortion Info—This variable was coded from the question "How much information do you have about the abortion issue? Do you have all the information you need, most of the information, some information, or very little information?" with the codes 1 (all the information), .67 (most of the information), .33 (some of the information), 0 (very little information). [Mean = .50; standard deviation = .35.]

Abortion Firm—This variable was coded from "How firm are you about your opinion on abortion—would you say you are very likely to change your opinion, somewhat likely to change, somewhat unlikely to change, or very unlikely to change?" with the codes 0 (very likely to change), .33 (somewhat likely), .67 (somewhat unlikely), and 1 (very unlikely). [Mean = .18, standard deviation = .27.]

APPENDIX B: SHAZAM CODE TO ESTIMATE HETEROSKEDASTIC PROBIT

The following code fragment illustrates the use of the nonlinear estimation procedure (nl) for an arbitrary likelihood function (indicated by the 'logden' option). This code fragment assumes that all the data are read into the program, and have been recoded as in Appendix A.

```
nl 1 / ncoef=14 logden
eq &
 (abhlth*log(ncdf((con+bl*black+m*male+c*cath+ri*religten+&
    at*attend+em*erameans+e*era)/&
  Exp(pc*abproct+pl*abconct+pcpl*abproct*abconct+&
      ai*abimp+ainf*abinfo+af*abfirm))))&
  +((1-abhlth)*log(1-ncdf((con+bl*black+m*male+c*cath+ri*religten+&
    at*attend+em*erameans+e*era)/&
  exp(pc*abproct+pl*abconct+pcpl*abproct*abconct+&
    ai*abimp+ainf*abinfo+af*abfirm))))
coef con 1 bl -1 m -1 c -1 ri -1 at -1 em 1 e 1 &
 pc 0 pl 0 pcpl 0 ai 0 ainf 0 af 0
end
```

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