Cross Pressure Scores:
A New and Improved Measure for an Old Concept

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ABSTRACT**:** Early studies of voter behavior hypothesized that the degree to which an individual was "cross-pressured" might affect how her political behavior. However, attention to this topic has waned in subsequent years. In an effort to reinvigorate this avenue of research, we present a new approach to estimating cross-pressures which improves upon existing methods by being (1) individual-specific, (2) an estimate of the sum total of all cross-pressures faced by an individual, and (3) can be estimated using widely-available data in a party system of any size, thus making it possible to study the effect of cross-pressures cross-nationally and over-time. We demonstrate that these estimates are robust, correspond well with existing measures of cross-pressures, and are correlated with patterns of behavior predicted by extant theories.

All statistical analysis was conducted using the Stata and R software packages.

1. Introduction: A New Measure for an Old Concept

Do citizens subject to conflicting political pressures approach politics differently from those who experience reinforcing pressures? For example, are cross-pressured citizens less likely to participate in politics? Though these questions motivated a great deal of research in 1940s and 50s, they have received correspondingly less attention in subsequent decades. Only recently has the topic of such "cross-pressures" found renewed interest from scholars, albeit primarily within the narrower confines of what is now called social network analysis.

While inconsistent empirical findings may be partly to blame for the disappearance of the study of the effects of cross-pressures on political participation, the dearth of research in this regard is also likely due to a lack of an effective, flexible, and readily-implemented method for measuring the degree to which individuals are subject to cross-pressures. Early approaches to estimating cross-pressures could only account for two sources of dichotomous cross-pressures at a time (e.g., were you a union member or not? were you black or white?), were inappropriate for use in multiparty systems, and did not keep pace with subsequent developments in political methodology. More recent approaches using social networks, meanwhile, are severely limited by the need for specialized data only available for a handful of elections—mostly in the US—and, even when such data are available, at best can only tap into a fraction of a respondent's actual social network, let alone other sources of cues regarding cross-pressures (e.g., elites, the media). Thus our goal here is to introduce a new measure of cross-pressures that is flexible enough to scale up to any number of political parties, incorporate any number of salient cleavages, can be calculated using data readily available in almost every election study, and estimate in total the likelihood of a respondent being cross-pressured in terms of politics. In doing so, we seek to reinvigorate the analysis of cross-pressures' effects on political behavior by providing scholars with a tool for analyzing the causes and effects of cross-pressures in a wide array of contexts: the *cross-pressure score*.

Our approach recalls early studies of voter behavior, using an individual's demographic profile to estimate the extent to which he or she is subject to conflicting or reinforcing political pressures, but radically extends the number of characteristics employed in this estimate; indeed, we calculate a unique estimate of cross-pressuredness for each individual. Our method is intended as a complement (rather than an alternative) to contemporary studies which delve into the social and psychological processes underlying the effects of conflicting and reinforcing pressures. While these other types of studies can directly measure subjective perceptions of group signals or communication through social networks – which cross-pressure scores do not – we can instead use cross-pressure scores to estimate the *overall level* of cross-pressures to which individuals are exposed, for which other methods are not as well suited. Moreover, cross-pressure scores are easily can be estimated in systems with any number of relevant political parties and have minimal data requirements. Thus not only can we compare the effect of cross-pressures on political behavior cross-nationally, we can also examine the effect of cross-pressures over time using data sets that were collected long into the past.

We begin by presenting a brief history of the study of cross-pressures (Section 2), before providing a simple framework for categorizing different types of studies of cross-pressures and identifying where our analysis fits into this framework (Section 3). We then explain how our measure is calculated (Section 4), and present a series of statistical assessments of the measure's general validity, as well as its specific utility in understanding the effect of cross-pressure on political participation (Section 5). We conclude (Section 6) with a discussion of how cross-pressures scores may be applied in future research.

2. Cross-Pressures: A History

Scholars have long suspected that citizens who are subject to cross-cutting pressures behave differently from citizens who experience reinforcing pressures. In perhaps the earliest example of

this line of research, Lazarsfeld and colleagues (1944, p.56) focus on the effects of "cross-pressures" that stem from "contradictory and opposing influences" on the voting decision, as a result of belonging to groups with conflicting tendencies. For various pairs of factors (e.g., religion and social class), researchers contrast the behavior of cross-pressured citizens—those pushed in opposite directions by each characteristic—with the behavior of citizens experiencing reinforcing pressures. Cross-pressured citizens were hypothesized to make voting decisions later in the campaign, show less interest in the election, have less stable vote intentions, and be less likely to vote.

The question of cross-pressures remained prominent in political behavior research during the 1950s (Berelson et al. 1954, Campbell et al 1960). These studies were especially focused on the mechanisms by which cross-pressures affected behavior. In particular, scholars explored whether the links between demographic group memberships and political orientations manifest through social interaction or group-linked policy attitudes. But despite early enthusiasm for the concept, research into the effects of cross-pressures on voting behavior faltered in subsequent decades.

We suspect that at least two factors contributed to this trend. First, scholarly interest may have diminished in part due to doubts raised by subsequent researchers. In particular, efforts to replicate the early findings with new data during the 1960s and 1970s produced inconsistent results, and reanalysis of earlier studies suggested that the impact of cross-pressures may have been confounded with the direct effects of social attributes (Horan 1971; Knoke 1990; see Mutz 2002 for a synopsis). In recent years, though, there has been renewed interest in illuminating the specific *processes* by which cross-pressures are thought to affect voters. Much of this work has employed data on social networks, using individual estimates of social pressures to test their impacts on voters' opinions and behavior (Huckfeldt and Sprague 1995; La Due Lake and Huckfeldt 1998; McClurg 2006a; Mutz 1998, 2002; Walsh 2003). From another direction, there has been new interest in what

we can call "issue cross-pressures" that stem from holding conflicting policy preferences (Hillygus and Shields 2008).

Thus within the general rubric of studies of cross-pressures, we find studies of cross-pressures stemming from memberships in particular socio-demographics groups, one's own network of acquaintances, and positions held on particular policy issues. Perhaps not surprisingly given the many theoretical directions in which the field has spread, no empirical consensus about the effects of cross-pressures has come about. Some studies have confirmed that cross-pressures decrease participation (Eveland and Hively 2009; McClurg 2006b; Mutz 2002), while others contend that they have no effect or even *increase* it (Jang 2009; Leighley 1990; Nir 2005; Scheufele et al 2006). Crucially, there appears to be little agreement on the proper way to model or even define cross-pressures of each type, hindering comparison between studies.

This brings us to the second possible reason that cross-pressures have been largely excluded from contemporary models of voting behavior. Early approaches to testing the effects of cross-pressures were a poor fit with evolving methodological trends, as initial waves of research were primarily bivariate in nature (Berelson et al. 1954; Campbell et al. 1960; Lazarsfeld et al. 1944). Given the multiplicity of factors that could influence voters' party and candidate preferences, these approaches provide a highly constrained look at cross-pressures, and one ill-suited for inclusion in the multivariate estimations that have come to dominate studies of political behavior.[1] Even in two-party systems, most people do not live in a world of only two salient demographic characteristics—and outside the US, most people do not live in two-party systems. Thus to reinvigorate the study of cross-pressures on behavior, a necessary prerequisite would seem to be a measure of cross-pressures

[1] Some researchers have attempted to account for cross-pressures in such analyses by using indicators for cross-pressures brought on by specific combinations of demographics (Powell 1976), but this is only feasible for examining a handful of characteristics at a time.

that takes a multitude of demographics characteristics into account, can be used in a multiparty context, and allows individuals' cross-pressures to be estimated from data which is widely available.

3. Cross-Pressures: A Conceptual Framework

With the extant literature having touched on so many different facets of cross-pressure (e.g., sources of cross-pressures, effects of cross pressures, and the mechanisms by which cross-pressures exert effects), we want to err on the side of caution in being very precise about what it is we mean by the "cross-pressures". From our perspective, the study of cross-pressures is best conceived of as essentially a two by three schema, drawing first on the distinction between two *sources* of cross-pressures – *group-based* and *issue-based* cross-pressures – and then on three different potential means by which individuals *become aware* of these cross-pressures (or the lack thereof): purely internal mechanisms; through interactions with peers; or through cues from elites.

Considering each of these distinctions in turn, *group-based* cross-pressures are those that emerge from *membership in particular social groups*, or what we commonly refer to as the "demographic characteristics" of an individual.[2] If one's various group memberships point one in a similar direction politically (e.g., an evangelical non-union member in the United States), then we can conceive of an individual as having low group-based cross-pressures. If one's group memberships push one in different directions politically (e.g., an evangelical union member in the United States), then one is more group cross-pressured. In contrast, *issue-based* cross-pressures are those that emerge from holding *positions on issues* that push one in different directions politically. For example, an individual who is pro-gun control (a Democratic issue) and anti-tax (a Republican issue) would be more issue cross-pressured than an individual who is both anti-gun control and anti-tax. While of course measures of group-based cross pressures and issue-based cross pressures are likely to be

[2] We eschew the use of the of the potentially more intuitive "social cross-pressures" label so as to avoid confusion with the social-networks literature, which has applied this term to pressures from one's personal social-network.

correlated – e.g., evangelicals are likely to have similar positions on abortion – and have causal relationships – someone may be issue-crossed-pressured precisely because they are group cross-pressured, they are still conceptually distinct concepts.

Second, we can consider the *process* by which individuals become aware of whether or not they are cross-pressured This process may come about purely through *introspection*: someone can sit alone in their apartment and realize that as a union member (or supporter of gun control laws) they ought to support the Democratic Party but that as an evangelical (or supporter of lower taxes) they ought to support the Republican Party. Alternatively, as has been the emphasis of the social networks literature, individuals may become aware of being cross-pressured through *conversations with personal contacts*. To take the previous example, perhaps our respondent hears pro-Republican messages from friends at church but pro-Democratic messages from fellow union members. Finally, an individual may become aware of being cross-pressured because of *messages from elites*. To turn again to our evangelical union member, it is possible that a national religious leader is providing pro-Republican messages, but the head of the AFL-CIO is providing pro-Democratic messages.

To be clear, the purpose of this manuscript is to introduce a method of *measuring* cross-pressures. For reasons of space, the examples we provide in the rest of the manuscript will be of *group-based* cross-pressures, (i.e., being pushed in different directions politically because of one's membership in particular socio-demographic groups) but the method we introduce for estimating group-based cross-pressures could just as easily be applied to issue-based cross-pressures. We utilize group-based pressures here simply because of the tighter connection to the original cross-pressures literature – which concentrated on cross-pressures stemming from social-demographic characteristics – but elsewhere we consider both group and issue-based cross-pressures (self-citation omitted). Additionally, we want to be clear that we are *not* attempting to sort out the mechanisms by which individuals become aware of these cross-pressures (i.e., the second dimension of the 2x3

schema: introspection, peers, or elites). Although not a focus of this current manuscript, we felt it important to identify this dimension here (a) as a way of organizing the existing literature in an effort to be clear about exactly how we were contributing to this literature and (b) because these mechanisms remain an important subject for future research.[3] For now, though, our goals are more modest: to provide a new means for measuring cross-pressures that meets the criteria laid out in previous sections, and it is to this task that we now turn.

4. Calculating Cross-pressure Scores

In this section, we introduce a new measure we term *cross-pressure scores* (hereafter CP scores). As we are exploring group-based pressures, these scores will take into account the individual respondent's membership in a wide array of socio-demographic groups, and then assess the extent to which each individual's particular set of demographic characteristics should either provide reinforcing or conflicting influences in terms of partisan preference.

We do this by using a four-step process.[4] Step 1 is to estimate the relationship between demographic characteristics and partisan preferences through regression analysis.[5] This analysis is not meant to function as a comprehensive model of preferences, but simply to measure the correlations between preferences and demographics. In other words, it demonstrates *across the entire electorate* the relationship between membership in each relevant socio-demographic group and different political parties; this will be our basis for assessing whether a given individual's particular

[3] Indeed, it is our hope that both our new measure of cross-pressure scores and the framework laid out in this section will help push forward the study of the mechanism by which cross-pressures are made more salient. For example, it may be the case the group-based cross-pressures are primarily activated by contact with peers (e.g., my union-member friends remind me to vote for the Democratic candidate and my evangelical friends remind me to vote for the Republican candidate) but that issue-based cross-pressures are more likely to be activated through elite cues (e.g., the media reports that Republican candidates are anti-tax and anti-gun control laws, causing me to realize that there is in an important incongruity in my own support for anti-tax and pro-gun control laws). Regardless of the specific hypothesis, we believe cross-pressure scores will be useful in testing any hypotheses of this nature.

[4] More detail about each step is provided in the next section, while Figure A1 in the Online Appendix provides a graphical display of the algorithm, and Appendix I describes the precise steps used for each dataset.

[5] If one wished to calculate issue-based cross pressure scores instead, one would simply substitute positions on particular issues for socio-demographic group-memberships and then follow the remaining steps in the algorithm.

pattern of socio-demographic characteristics provides reinforcing or conflicting partisan implications. To do so, we then generate, for each individual, the predicted probabilities (Step 2) of supporting each party or candidate using the results obtained in Step 1. These probabilities, taken together, capture the extent to which an individual's particular combination of demographic characteristics push her toward one reasonably clear partisan preference, suggesting the presence of reinforcing pressures, or leave her torn among two or more options, suggesting conflicting pressures on the basis of social group memberships. We can summarize the extent of such cross-pressures by calculating the variance in predicted probabilities across parties (Step 3): the lower the variance in these predicted probabilities, the more an individual's social-group memberships push her equally towards multiple parties, i.e., the more she is cross-pressured.[6] Finally, we rescale this value as needed and subtract it from its maximum (Step 4), so that higher scores reveal more cross-pressured individuals, thus producing an individual-specific CP score.

These CP scores meet all of the requirements for a new measure of cross-pressures laid out previously: they efficiently accommodate any reasonable number of demographics in a single measure; they can be readily applied not just to two-party systems, but to multi-party systems as well; and as the only variables required are demographics and partisan preferences, the measure can be calculated for most any dataset commonly used to study voter behavior.

Satisfying these requirements is necessary for developing a broadly useful measure of cross-pressures, but it is not sufficient on its own. The next critical step is to validate that the measure actually reflects cross-pressures experienced by voters, and does not simply generate noise or serve as a proxy for something else entirely. The remainder of this section addresses these concerns by using data analysis to answer the following questions:

[6] We use the term "variance" herein to refer to the variation in respondents' probabilities of supporting each party, but that term is only used in the general sense. The exact way "variance" is quantified—which may or may not involve the calculation of variance in the statistical sense—is discussed later in the paper.

1. *How robust are CP scores to the particular choices involved in estimating them?*

2. *Are CP scores correlated with other existing approaches to measuring cross-pressures?*

3. *Do CP scores have the effects on voter behavior predicted and (sometimes) shown in the existing literature?*

As we cannot measure an individual's experience of cross-pressures directly, there is no absolute standard by which to compare the accuracy of any particular method. But with that caveat, a finding that CP scores are robust, that they match up with existing measures, and that they are correlated with political behavior in the expected direction would go far in establishing our measure's validity.[7]

5. Validation

To validate our CP scores, we draw on four different data sources. For most tests in the two-party US context, we employ the 2004 National Annenberg Election Study (NAES). To extend our testing to the multiparty context, we rely on the 2001 Polish National Election Study (PNES).[8] For one test which required data from more than two countries, we use data from Wave 2 of the Comparative Study of Electoral Systems (CSES). Finally, in order to assess the correlation between our measure and direct estimates of social cross-pressures, we rely on the 2006 General Social Survey (GSS), which includes data on the partisan makeup of respondents' social networks.

5.1 How Robust are CP scores?

CP scores are fairly straightforward on a conceptual level, but implementing them in a particular dataset requires choices on the part of the analyst. Here, we briefly identify five of these choices, and report on how robust our measure is to various specifications of each. (The precise steps used to calculate CP scores in each dataset are listed in Appendix I.)

[7] These questions are most similar to the typology of measurement validation procedures proposed by Adcock and Collier (2001), but given that (as we discussed in the introduction) cross-pressure scores are indirect estimates of cross-pressures rather than direct measurements, their framework only partially matches the needs of this analysis.
[8] The 2001 election resulted in six viable parties entering the parliament—all of which received at least 7.5% of the vote—providing a stark contrast with the two-party US context.

The first choice is to determine the dependent variable measuring partisan preference to be used in Step 1 of our algorithm. Conceptually, this variable should sort respondents based upon their preferred parties or candidates. The two most obvious options, then, are vote choice and self-reported partisanship. For the main analyses in this paper, we use vote choice, but a case could be made for either.[9] Ultimately, though, the two will produce similar results in most contexts: for example, using NAES data, we find that the resulting scores assigned to US respondents are correlated at 0.90.

A second important choice is which parties to include in the dependent variable in Step 1. While there is a conceptual attractiveness to including all possible options, subsample size will become a concern for parties that receive smaller levels of public support; where the data include few supporters of a specific party, estimation may over-fit results to the unique characteristics of the individuals sampled. Appropriate thresholds, therefore, could depend upon two factors: the number of supporters in the dataset, and the number of supporters in the electorate. This is usually an obvious decision in a case like the United States, where one would almost always limit the Step 1 regression analysis to supporters of the Democratic or Republican parties, but becomes more of an issue in multiparty systems. We therefore examined correlations between CP scores from Poland calculated using the top 4, 5, 6, 7, and 8 parties in the 2001 Polish elections. As Table 1 demonstrates, these CP scores generated from these different analyses are highly correlated—of all the pairings, the correlations between individuals' scores is at worst 0.85 in this data—thus giving us confidence that the measure is fairly robust to how many parties we include in our Step 1 analysis.[10]

- INSERT TABLE 1 ABOUT HERE –

[9] In previous versions of this paper, we included a discussion of the trade-offs between using vote choice and partisanship as the dependent variable in the first regression. This material is available from the authors upon request (and could also be added to the online appendices should reviewers so desire).

[10] The alternative variance calculation methods listed in the table are described later in this section.)

The third choice concerns which demographic variables to include in Step 1 of the CP score algorithm. There are no easy rules we can propose to guide individual analysts in their choices; we merely suggest that both theoretically and contextually appropriate demographics be included. This issue is likely to be most acute for researchers comparing surveys across countries or long periods of time, where the availability and relevance of specific measures will vary. To get a sense of the implications, we compared two approaches in creating CP scores for five countries in the Comparative Study of Electoral Systems dataset: one which uses the "best-available" set of demographics for explaining partisan preferences in each country, and a second which only uses a "core" set of variables that are available across all five surveys. The main difference between these sets was the omission of variables reflecting race, religion, ethnicity, language, and region from the core set. In countries lacking such divisions or where most of these divisions are not salient for party politics (Great Britain, Poland, and South Korea), we found strong correlations, ranging between 0.84 and 0.93, between CP scores calculated with the core and best available variables in each country. But the decision to adopt the core variables approach was more problematic in Israel and the US, because it meant the exclusion of demographics which are obviously highly salient to national politics. The correlation in CP scores based on core and best available variables dropped to 0.46 in the US and 0.58 in Israel. Thus the decision to include or exclude variables should be made with eye toward being able toward the best mix of comparability and accuracy.[11]

Once our initial regression (Step 1) is complete and we have predicted probabilities of voting for each party for each individual (Step 2), we still need to turn these probabilities into usable CP

[11] To illustrate how these decisions affect subsequent analyses using cross-pressure scores, we repeated the analysis conducted in Section 4.3 using scores generated from only a "core" set of demographics (omitting country-specific variables such as race, region, language, religious denomination, and so forth, as described in this section) in the US. These results—presented in Table A4 of the online appendix—are meant for comparison with Table 4 below, and show that the effects of these "core" cross-pressure scores are in the same directions at those of their "best-available" cousins, but of a moderately-diminished magnitude (up to 50%, in terms of coefficient size). As we would expect, scores generated less precisely are weaker predictors of behavior, but the consistency of this pattern across models demonstrates that our measure is not overly reliant on a particular specification or proxying for one or two especially-important demographics.

scores. We do this by calculating the variance across predicted probabilities for each individual. If voters are really only deciding between their two most preferred parties, then it is best to calculate CP scores using only the variance across the two largest predicted probabilities of party choice; inclusion of additional probabilities may simply add noise. If, however, voters consider the full range of parties, then we would want to include all of the predicted probabilities in the calculation of her CP score. Ultimately, this is a conceptual question: which parties truly matter to the respondent's decision making process? Fortunately, our analysis of the Polish data shown in Table 2 reveals little difference in the CP scores generated by each of the alternative approaches we tested: calculating variance based on individual's likelihood of voting for his top 2 parties, his top 3, or for all of the parties. So while this may be an interesting conceptual question, the measure itself appears fairly robust to how the question is answered.

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The final choice for the researcher involves how to rescale our variance measures to create CP scores. This is not actually a test of the measure's internal validity, as the rescaled measure used will by definition be highly correlated with the un-rescaled version. However, we do want to highlight the procedure we have used in this manuscript, which is to rescale the variances from 0 to 1 then subtract the rescaled values from 1, so that the respondents with the lowest variance (the most cross-pressured, as this indicates the most equal preferences between parties) would have the highest CP scores, thus making the measure more intuitive.

5.2. Are CP Scores Correlated with Existing Approaches?

Our next test is to assess the extent to which CP scores match up with what we already know about cleavages in American politics. For citizens who ought to be more cross-pressured (based on what we know about American politics), we should find higher CP scores. We begin with the following assumptions (confirmed by data): evangelicals, rural residents, whites, and Southerners

tend to favor the Republican party, while urbanites, the poor, those in union households, and Northeasterners tend to favor the Democratic party. Thus we expect on average to find the following:

1. *Higher CP scores among evangelicals in union households than among evangelicals in non-union households*
2. *Higher CP scores among the rural poor than among the urban poor*
3. *Higher CP scores among Northeastern whites than Southern whites.*

In each case, the former group is assumed to be subject to conflicting pressures, while the latter group experiences reinforcing pressures. Thus our first step is to see whether the CP scores calculated through our method behave as expected in these three stylized cases.

Creating CP scores in the US is very straightforward. We generate CP scores for each respondent in the 2004 NAES using two-party presidential-level vote intention (for pre-election respondents) or actual vote choice as the initial dependent variable. Only two parties are considered, since no other party's candidate received even 0.5% of the popular vote. This makes our specification simpler; the debate over variation calculation methods is moot, because all would produce effectively the same results, and rescaling is also a non-issue. We simply calculate CP scores by taking the absolute difference in predicted vote probabilities and subtracting that number from 1. The Step 1 regressions include a wide array of demographic variables, and the majority of these variables are highly significant in predicting vote choice.[12]

-- INSERT FIGURE 1 ABOUT HERE –

The top half of Figure 1 presents the distribution of CP scores for the entire US population. This serves as a baseline for purposes of comparison. The bottom half of the figure displays the distribution of CP scores across the six sub-populations we identified above. The findings are clear.

[12] We include gender, age, education, employment status, occupation, income, union membership, race, immigrant (vs. native born), religion, gun ownership, urban residence, and others. See Table A1 in the Appendix for results; comparable results for Poland are presented in Table A2.

In all three cases, individuals in groups expected to be more cross-pressured (evangelical union, rural poor, Northeastern whites) show markedly higher CP scores than those in the corresponding reference groups. This effect is particularly dramatic in the case of evangelicals. Evangelicals in non-union households are the least cross-pressured of all six subpopulations on average, and the only distribution where the mode is clearly on the left side of the midpoint. Conversely, evangelicals in union households have a higher mean CP score (0.602 vs. 0.509), and the distribution of scores for this group peaks at a very high level (between 0.8 and 0.9). Across these six groups of voters, we find higher and lower CP scores where we expected to find them, increasing our confidence in the validity of our measure. At the same time, within each group there is still a wide-ranging distribution of individual scores, which demonstrates the value of moving beyond pairwise combinations and looking at the combined impact of cross-pressures across a wide range of demographics.[13]

Table 3 extends this analysis by presenting summary data on more than 40 additional combinations of demographics. To create this list, we selected five of the most Republican-leaning and Democratic-leaning characteristics (based on the preferences of NAES respondents), and calculated the mean CP scores among respondents belonging to each possible combination of these ten demographics. We compare the mean CP scores for respondents of each combination with an expectation based on the partisan leanings of each demographic. CP scores should be highest for those groups which are expected to be cross-pressured (i.e., the two-demographic characteristics that point in different partisan directions, which was the original approach of Lazarsfeld et al. 1944).

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The table shows a very strong correlation between expected levels of cross-pressures and mean CP scores. At the top of the list with the highest average CP score (.762), are those in gun-

[13] It is worth reiterating that traditional measures of capturing cross-pressures through the use of dummy variables assumes that all people with a particular socio-demographic profile—e.g., Evangelical union members—face the *same* cross pressures. Our method, in contrast, calculates a separate cross pressure score for each individual, reflecting the fact that, for example, the population of Evangelical union members still varies in terms of age, race, gender, and so forth.

owning, non-churchgoing households; as gun-owning favors Republicans and non-church-going favors Democrats these individuals are expected to be cross-pressured. At the other end, evangelical gun-owners are not expected to cross-pressured—both demographics favor Republicans—and indeed have a much lower mean CP score (0.433). The groups in between show a similar pattern. With only a handful of exceptions, those expected to be cross-pressured show above-average CP scores, while those not expected to be cross-pressured show the opposite. CP scores thus align well with the approach used by early researchers to estimate cross-pressures for individuals with particular combinations of demographic characteristics.

We next compare our estimates of cross-pressures with existing measures of cross-pressures stemming from individuals' social networks. Drawing on data from the 2006 GSS, Figure 2 compares respondents' CP scores with reported cross-pressures in their social networks. Among the methods used for calculating cross-pressures in recent research into social networks, two distinct approaches have been used. The first, looking at the heterogeneity of political preferences within social networks (Huckfeldt 2004; Nir 2005; Scheufele et al 2006), is presented at the top of the figure. In this figure, heterogeneity (sorted into quintiles) reflects the absolute differences between the proportions of Republicans and Democrats among the respondent's reported acquaintances; those with an even balance between the groups are considered to have the most heterogeneous networks. The graph clearly shows a strong and highly-significant relationship between CP scores and network heterogeneity, with the difference in mean CP scores between the lowest and highest quintiles of about 0.06. As predicted, those with the most heterogeneous social networks are assigned the highest CP scores.

-- INSERT FIGURE 2 ABOUT HERE –

The second common method for estimating social network cross-pressures is to calculate the proportion of an individuals' discussants with whom she conflicts over partisan preferences

(Huckfeldt et al 2005; McClurg 2006; Mutz 2002; Mutz and Mondak 2006). The bottom graph in Figure 2 compares the proportion of each partisan respondent's acquaintances from the opposing party with CP scores. The relationship in this graph is even stronger than the one above: moving from the lowest to highest quintiles is linked to a difference in CP scores of over 0.12. Those with the most partisan disagreement in their networks also receive the highest CP scores on average.

Our final test looks at whether our group-based cross-pressure measure correlates with a simple measure of attitudinal conflict (Campbell et al. 1960, p.81), as a product of respondents' policy preferences across a range of issues.[14] Using data on 23 distinct policy issues in the 2004 NAES, we coded responses as pro-Democratic, pro-Republican, or neutral, based on whether each policy choice pointed in a clear partisan direction.[15] The numbers of pro-Democratic and pro-Republican preferences from each respondent were tallied and used to calculate the level of conflict across her policy attitudes. As in the previous figure, two variants of the measure are presented. The top graph in Figure 3 shows the correlation between policy inconsistency across issues (the degree to which a respondent's attitudes push toward *different* parties across issues; similar approaches are used in Campbell et al 1960, Nie et al 1976, and elsewhere) and CP scores. The bottom graph, meanwhile, shows the relationship for policy inconsistency with the respondent's party identification (the degree to which a partisan respondent's attitudes push toward the *opposing* party, as is used in Hillygus and Shields 2008).

-- INSERT FIGURE 3 ABOUT HERE –

In both graphs, the relationship is once again very strong and significant, and in the predicted direction. The difference in CP scores between those in the lowest and highest quintiles of both conflict measures is over 0.10. Much as was seen with the measures of social network pressures in the previous figure, CP scores are shown here to be positively-correlated with commonly-used

[14] Readers should not confuse this measure with calculating an issue-based CP score, which we are not estimating here.
[15] Classifications as pro-Democrat, pro-Republican, or neutral made by authors; see Table

measures of attitudinal cross-pressures in the existing literature. As such, we have even greater confidence that CP scores are capturing the phenomenon they are intended to measure.

5.3 Do CP scores Show the Expected Effects on Behavior?

The final evidence in support of CP scores' validity comes from their application in predicting political behavior. These applications are not intended to test causal hypotheses in their own right; rather, the models are designed to merely to examine whether there is a correlation between CP scores and each behavior as predicted in previous studies.[16]

Table 4 highlights the results of ten such models. (Full regression results are presented in Table A3 of the online appendix.) The first three models look at CP scores' effects on three forms of political participation—voter turnout, advocating for a candidate to other voters, and contributing to campaigns—using the post-election wave of the 2004 NAES general election panel. For each of these variables, higher cross-pressures should be linked to lower rates of participation.

—INSERT TABLE 4 ABOUT HERE—

These results clearly live up to that prediction: for all three models of participation, the coefficient on CP scores is negative and highly significant. The margins listed in the subsequent rows provide estimated outcomes if all voters were (alternatively) at the 10^{th}, 50^{th}, and 90^{th} percentiles (from lowest to highest, relative to the overall population) in terms of CP scores, holding all other variables at their actual values. For turnout, the effect of moving from the 10^{th} to the 90^{th} percentiles is a decrease of 3.4%. (Given the incredulously high rate of reported turnout, however, one might suspect a stronger relationship were turnout measured more accurately.) Advocacy and donations show slightly larger effects from the same manipulation, with decreases of 4.7% and 6.0%,

[16] The specifications of each model are as such deliberately simple, only accounting for cross-pressure scores, the demographics used to create them, and a few simple controls.

respectively. The change in donation rates is actually a 50% increase (off a small baseline) in the likelihood the a low-cross pressured individual will donate relative to high-cross pressured individual.

There's certainly no doubt that the modest correlations between participation and CP scores reward the massive sample sizes in the NAES dataset. But to a large degree, this serves to promote our case for the utility of CP scores. Existing studies of cross-pressures are plagued by noisy estimates and small samples, and these factors have surely contributed to the inconsistency of the resulting findings. By using CP scores with much larger datasets as we do here, these problems can be somewhat alleviated, allowing researchers to more acutely discern the presence of small but significant effects amid myriad other moving parts.[17]

The next five models test CP scores on potential mediating variables between cross-pressures and participation—that is, cross-pressures could induce changes in these variables, which would in turn influence participation. A variety of studies have both suggested and presented evidence that cross-pressures decrease interest, inhibit discussion, and limit knowledge, while promoting indifference and alienation.[18] As in the previous models, the coefficients for these five variables are all in the predicted direction and highly significant, although the sizes of the estimated effects are fairly modest. Interest decreases by 0.07 and discussion by 0.09 (each on 3-point scales) in the move from the 10th to 90th percentiles of CP scores, while political knowledge decreases by 0.06

[17] To provide additional context for these effect sizes, Table A5 of the online appendix presents comparable estimates for various levels of age, education, and income. We use these three variables because they are widely accepted to be among the most important predictors of participation, and while in most instances the effects of cross-pressure scores are smaller, they are still of a substantial magnitude.

[18] With regard to indifference, the concept of individuals being unable to choose between candidates or parties has actually taken (at least) two forms in the existing literature. In theories of behavior rooted in rational choice, the form of "indifference" used here has been most common, based on the relative evaluations of candidates / parties (with more similar evaluations indicating higher indifference). Among those concerned with social and political psychology, however, "ambivalence" (in which intensity of affect is also taken into account; those with strong but indifferent feelings are more ambivalent than those who are merely apathetic) has received more attention (see Lavine 2001 and Basinger and Lavine 2005, for example; further confusing matters, "indifference" is also used by some authors to indicate neutrality without affect—the counterpoint to ambivalence). Given that indifference is easier to interpret, more readily quantified, and may be more correlated with participation (Yoo 2010), we choose to focus on that variable herein.

(on a 6-point scale).[19] Indifference and alienation, meanwhile, both increase; the average distance between presidential candidate ratings increases by 8.3 (out of a possible 100), while the distance between the rating of the preferred candidate and the maximum possible rating (100) increased by 3.6. While this analysis does not distinguish the interrelationships between participation and these mediating variables, it does clearly demonstrate that CP scores are correlated with variables which are considered to be potential intervening variables through which cross-pressures could impact participation.

The final pair of models turn to the effect of cross-pressures in Poland, looking at both voter turnout and political interest. Given that little extant work offers guidance as to whether cross-pressures should operate in multi-party contexts the same as in the US, the results speak less to CP scores' validity and more to their potential.[20] Nonetheless, these results are intriguing. Despite the much smaller sample size and simpler specifications used in Poland, the effect of CP scores on both turnout and interest are highly significant and in the predicted directions (with CP scores linked to lower turnout and interest). Moreover, the magnitudes are large: going from the 10^{th} to 90^{th} percentiles of CP scores decreases turnout by nearly 20% and diminishes interest by 0.44 on a 4-point scale. Given that these tests were not crafted specifically for cross-national comparison, it would be imprudent to relate these results to those from the US. They do, however, show some of the promise offered by CP scores for extending research on cross-pressures into other contexts.

6. Conclusion

The purpose of this manuscript has been to introduce a new tool for measuring cross-pressures. The tool is the first of its kind to estimate cross-pressures uniquely for individuals based

[19] Knowledge scales assign one point for being able to rate each of Bush, Kerry, Cheney, and Edwards on thermometer scales, and one point each for describing Bush as moderate or conservative and Kerry as moderate or liberal.
[20] There are only a small number of existing studies of cross-pressures outside of the US context. Among the most prominent, Powell (1976) examines the effects of cross-pressures on rates of partisanship in Austria, while Huckfeldt et al (2005) look at political discord in social networks among respondents in three countries during the early 1990s.

on a wide array of demographic variables—not just a few modeled interactively—and allows the data to reveal the links between demographic characteristics and partisan preferences. Additionally, it is flexible enough to fit a range of political and social contexts with only minimal data requirements. Finally, our method can be applied in cross-national research and to existing datasets, allowing us to study the effects of cross-pressures in a variety of different circumstances.

We submitted this new measure of CP scores to a wide range of analytical tests using data from four sources and multiple countries. We have found that the measure is robust to a variety of specifications; that it does indeed yield higher CP scores for individuals whom we expect to be more cross-pressured; that it is correlated with more existing measures of cross-pressures; and that it predicts reduced participation as well as hypothesized changes in potential mediating variables. All told, these results demonstrate that CP scores can be a useful tool in the study of political behavior.

Our method for constructing CP scores in this paper is intentionally simple, but there is certainly potential for the procedure to be refined. Given that the CP scores generated here do not account for the significance of demographic predictors in the initial party preference regression, there is a risk that high-magnitude / low-significance coefficients may add noise to the resulting predicted probabilities. In this case, it may make sense to use an iterative procedure for predicting probabilities, using repeated simulations to diminish the impact of highly-uncertain coefficients.[21] Another possible innovation would be to make use not only of the values of each probability predicted in Step 2, but also the ordering of these probabilities among parties—in a multiparty system, the identities of the parties between which an individual is most pressured between could show us another dimension of cross-pressures which might prove valuable.

Even with such improvements, however, it is important to recognize certain limits of CP scores. First, they are an estimate og the total potential for cross-pressures stemming from one's

[21] When we applied this procedure to NAES data, it made a negligible difference in the resulting scores, but with a smaller sample size it may prove more valuable.

demographic characteristics (as illustrated here) or issue preferences (as outlined in Section 3), but they do not necessarily reflect an individual's subjective experience of cross-pressures. Though subjective measures of cross-pressures are fraught with their own difficulties (Craig and Martinez 2005), one potential avenue for future research may be in using such measures in conjunction with CP scores to investigate how the *potential* for cross-pressures becomes manifest (or not) in subjective experience. In addition, CP scores are not a substitute for research on micro-level mechanisms of political influence, such as political communication within one's social network or group-linked policy attitudes. Finally, even assuming all relevant social attributes are included in the construction of CP scores, the scores—as presented here—do not reflect individual-level heterogeneity in the personal importance and salience of social identities.

With these caveats acknowledged, we continue to believe that the value of CP scores tremendously outweighs their limitations. While researchers have investigated the role of cross-pressures in determining political behavior for more than sixty years, our understanding of cross-pressures' impacts has been hindered by inadequate methods and limited data. Early approaches required little data or technical expertise, but their results were as crude as their techniques; recent approaches offer more precision, but the associated costs severely restrict their application. To move forward, studies of cross-pressures requires a third option, in which widely-available data can be used to estimate cross-pressures in a multitude of political contexts. The purpose of this paper has been to demonstrate that *such an option now exists*. Using the methods described here, researchers can estimate cross-pressures straightforwardly and effectively, and as such bring renewed attention to the importance of cross-pressures in understanding political behavior.

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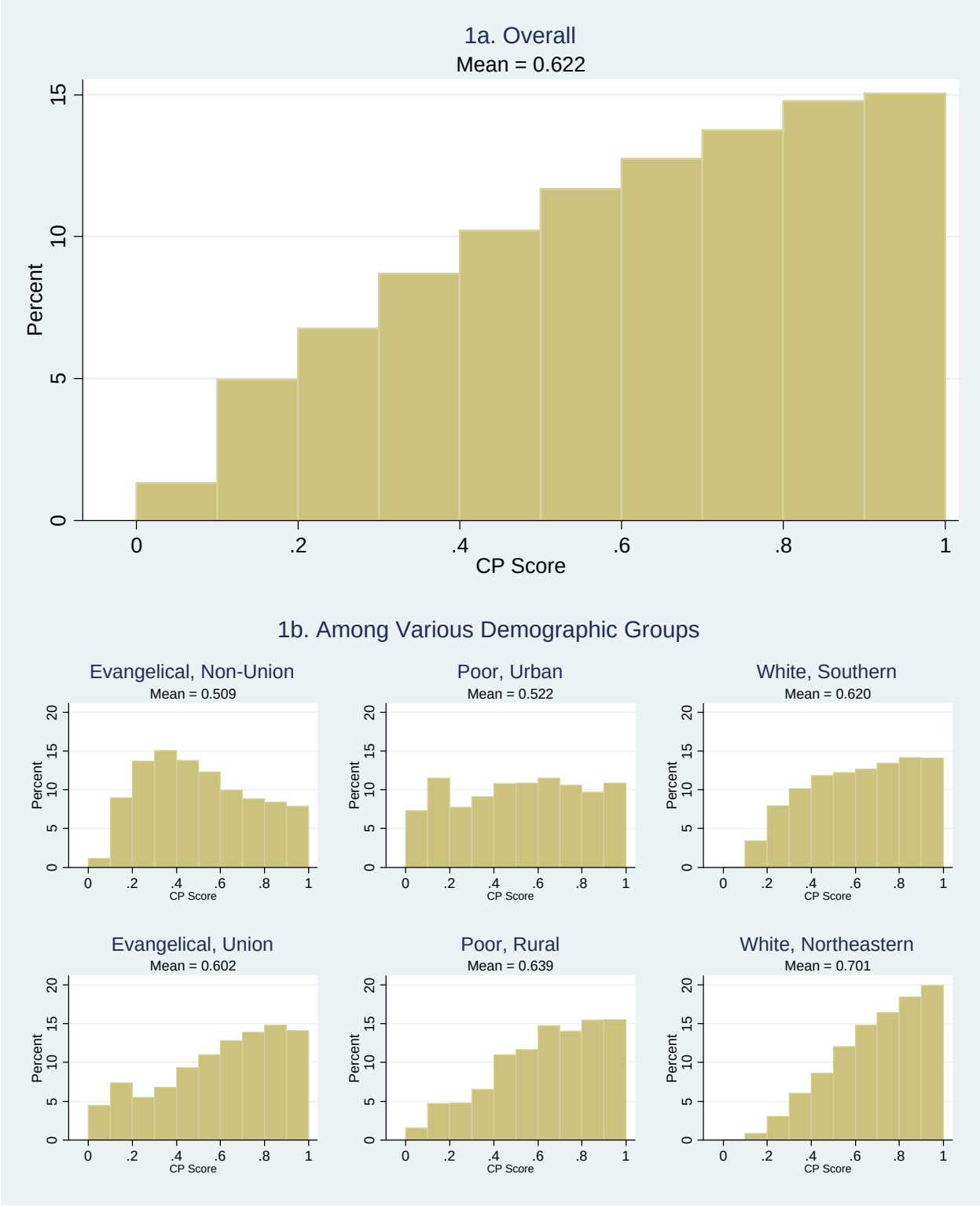
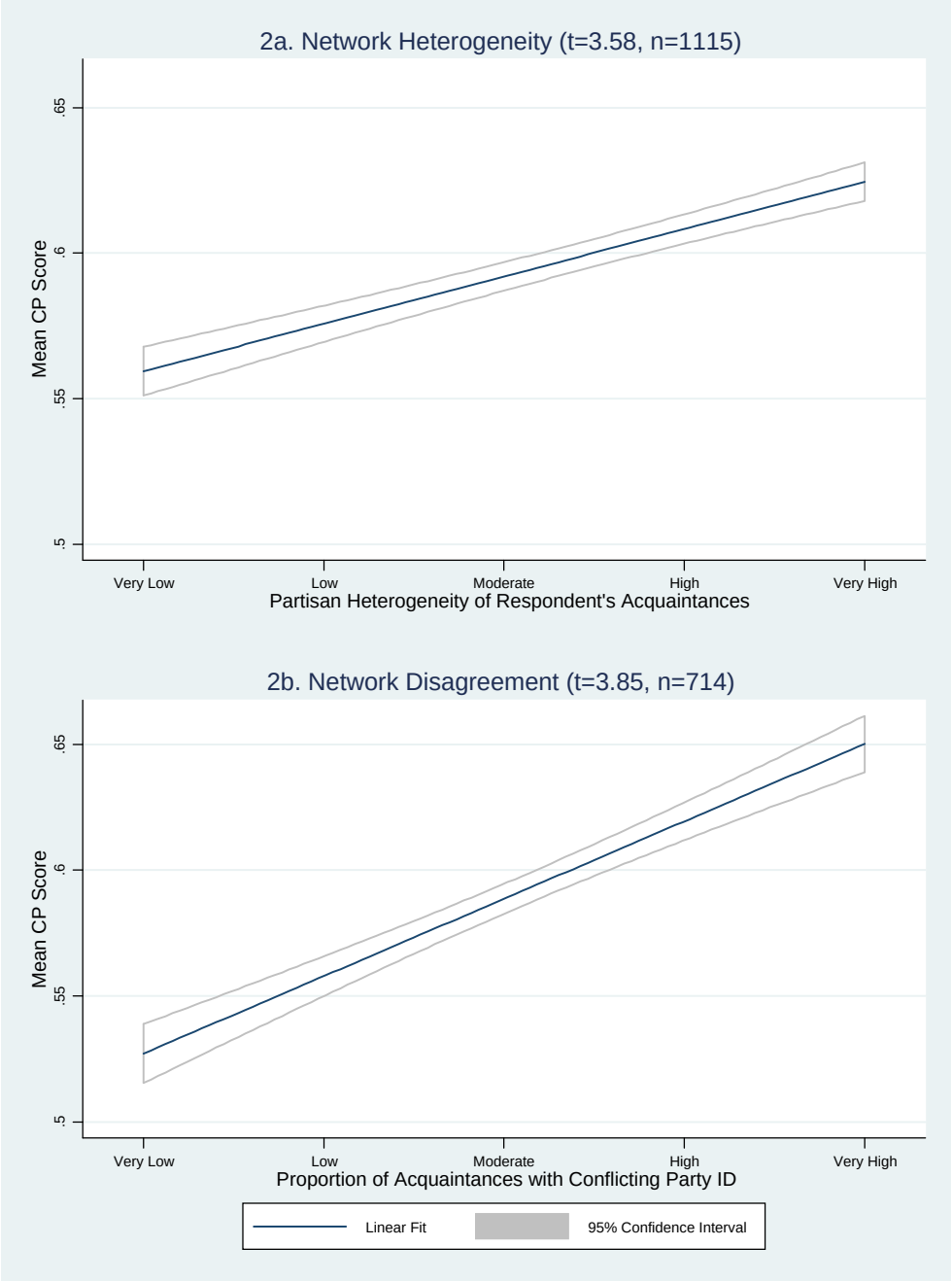
Figure 1: Distribution of Cross-Pressure Scores in the United States



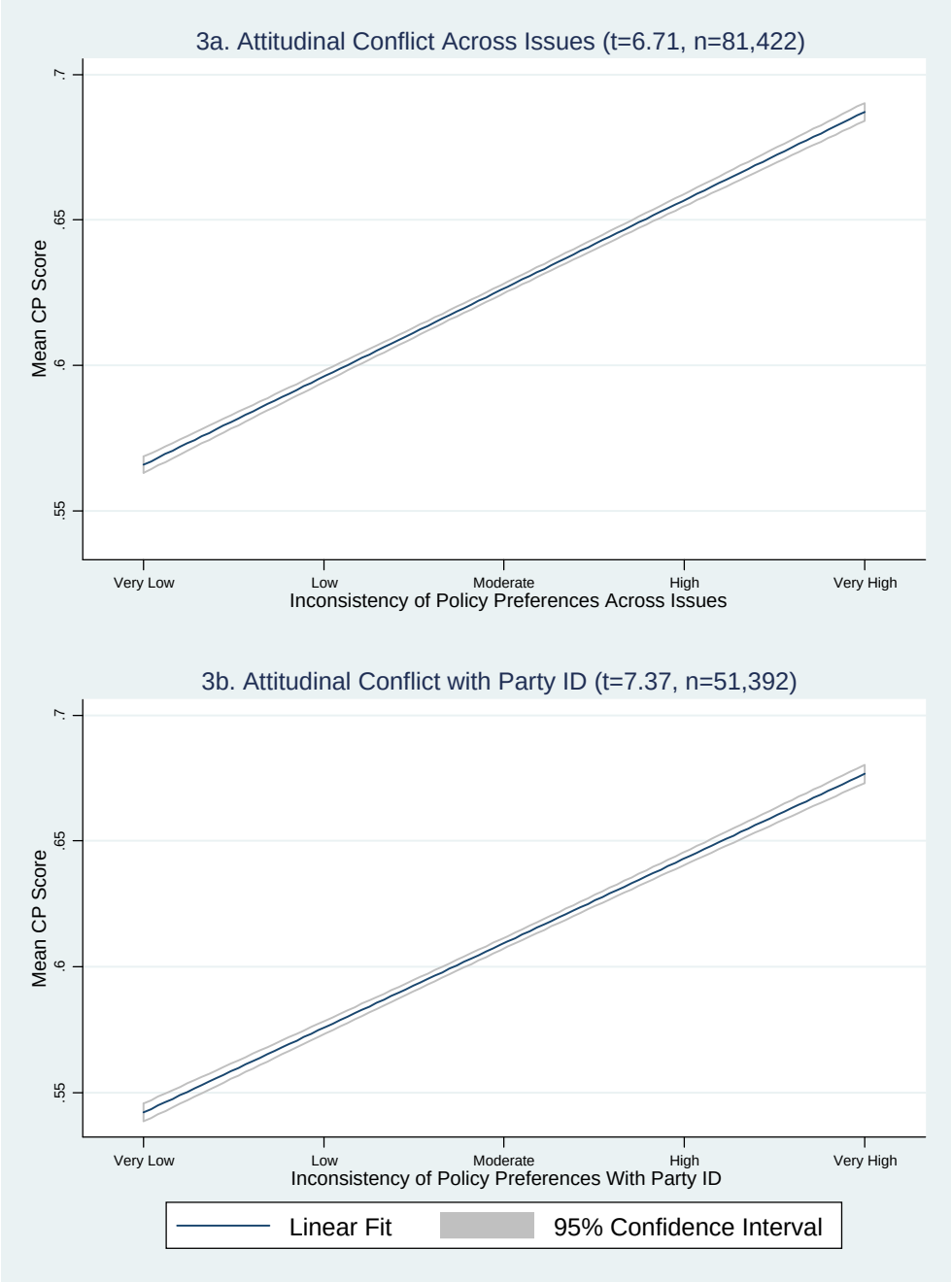
0 = Least cross-pressured, 1 = most cross-pressured. Data from 2004 National Annenberg Election Survey, *n* = 81,422 for overall population.

Figure 2: Cross-Pressure Scores and Social Networks



Data from 2006 General Social Survey. Respondents were asked about the number of Democrats and Republicans among their acquaintances. Heterogeneity reflects the absolute difference between the sizes of each group in the respondent's social network, with higher heterogeneity indicating a more even balance. Disagreement reflects, for respondents who identify as Democrats or Republicans, the proportion of the respondent's social network which identifies with the opposing party. In each figure, respondents are sorted into quintiles. *Respondents with higher social cross-pressures are shown to have higher average cross-pressure scores.*

Figure 3: Cross-Pressure Scores and Attitudinal Conflict



Data from 2004 National Annenberg Election Survey. For 28 distinct policy issues, respondents' policy preferences were coded as pro-Democratic, pro-Republican, or neutral. (Because of sample splits and variation in survey design over time, each respondent was asked only about a subset of issues; the remaining preferences, missing at random, were multiply imputed to facilitate comparison across respondents.) Conflict across issues is highest when respondents hold a large number of non-neutral preferences and these preferences are evenly split between parties, while conflict with party idenfication is highest when partisan respondents hold a large number of non-neutral preferences and these preferences overwhelmingly favor the opposing party. *Respondents with higher attitudinal conflict are shown to have higher cross-pressure scores on average.*

Table 1: Correlations Between Cross-Pressure Scores Using Different Numbers of Parties in Poland

Full Variance Method

	4 Parties	5 Parties	6 Parties	7 Parties
5 Parties	0.9008			
6 Parties	0.8717	0.9700		
7 Parties	0.8523	0.9426	0.9905	
8 Parties	0.8580	0.9349	0.9805	0.9902

Top-3 Variance Method

	4 Parties	5 Parties	6 Parties	7 Parties
5 Parties	0.9098			
6 Parties	0.8948	0.9822		
7 Parties	0.8902	0.9729	0.9965	
8 Parties	0.8902	0.9697	0.9926	0.9959

Top-2 Variance Method

	4 Parties	5 Parties	6 Parties	7 Parties
5 Parties	0.9363			
6 Parties	0.9179	0.9820		
7 Parties	0.9110	0.9740	0.9961	
8 Parties	0.9094	0.9714	0.9929	0.9970

Data from 2001 Polish National Election Study, n = 1794.

Table 2: Correlations Between Cross-Pressure Scores Using Different Variance Calculation Methods in Poland

4 Parties

	Full Variance	Top-3 Variance
Top-3 Variance	0.9788	
Top-2 Variance	0.9166	0.9404

5 Parties

	Full Variance	Top-3 Variance
Top-3 Variance	0.9604	
Top-2 Variance	0.9231	0.9680

6 Parties

	Full Variance	Top-3 Variance
Top-3 Variance	0.9577	
Top-2 Variance	0.9149	0.9693

7 Parties

	Full Variance	Top-3 Variance
Top-3 Variance	0.9525	
Top-2 Variance	0.9089	0.9715

8 Parties

	Full Variance	Top-3 Variance
Top-3 Variance	0.9559	
Top-2 Variance	0.9138	0.9717

Data from 2001 Polish National Election Study, n = 1794.

Table 3: Vote Differences and Cross-Pressure Scores by Demographic Combination

Demographic Combination	Expectation	Mean CP Score	*n*
Gun-owner, Non-churchgoing	Cross-pressured	0.762	5436
Military Family, Non-churchgoing	Cross-pressured	0.704	4358
Gun-owner, Union Household	Cross-pressured	0.698	5628
Rural, Non-churchgoing	Cross-pressured	0.687	2816
Southern, Non-churchgoing	Cross-pressured	0.678	3077
Rural, Union Household	Cross-pressured	0.675	2363
Gun-owner, Highly-educated	Cross-pressured	0.657	4882
Military Family, Highly-educated	Cross-pressured	0.652	4114
Military Family, Union Household	Cross-pressured	0.647	4209
Gun-owner, Poor	Cross-pressured	0.645	3378
Rural, Highly-educated	Cross-pressured	0.643	2116
Rural, Poor	Cross-pressured	0.639	3894
Military Family, Poor	Cross-pressured	0.638	3081
Southern, Highly-educated	Cross-pressured	0.625	3623
Gun-owner, Urban	Cross-pressured	0.625	6576
Military Family, Urban	Cross-pressured	0.615	6270
Evangelical, Poor	Cross-pressured	0.612	6001
Rural, Military Family	Not Cross-pressured	0.610	5839
Evangelical, Union Household	Cross-pressured	0.601	4122
Southern, Union Household	Cross-pressured	0.597	2003
Rural, Gun-owner	Not Cross-pressured	0.590	10232
Gun-owner, Military Family	Not Cross-pressured	0.589	13094
Southern, Poor	Cross-pressured	0.578	3976
Highly-educated, Urban	Not Cross-pressured	0.576	4918
Southern, Urban	Cross-pressured	0.565	4986
Military Family, Southern	Not Cross-pressured	0.564	7431
Evangelical, Highly-educated	Cross-pressured	0.559	3494
Rural, Southern	Not Cross-pressured	0.557	6321
Non-churchgoing, Urban	Not Cross-pressured	0.551	4679
Non-churchgoing, Highly-educated	Not Cross-pressured	0.539	2818
Poor, Non-churchgoing	Not Cross-pressured	0.538	2606
Union Household, Non-churchgoing	Not Cross-pressured	0.538	2268
Union Household, Highly-educated	Not Cross-pressured	0.536	2435
Gun-owner, Southern	Not Cross-pressured	0.531	10539
Evangelical, Urban	Cross-pressured	0.527	7729
Rural, Evangelical	Not Cross-pressured	0.527	8602
Poor, Urban	Not Cross-pressured	0.522	4210
Union Household, Urban	Not Cross-pressured	0.505	3577
Evangelical, Military Family	Not Cross-pressured	0.483	9588
Evangelical, Southern	Not Cross-pressured	0.471	11494
Gun-owner, Evangelical	Not Cross-pressured	0.433	13670

To determine the combinations listed in this table, we first tabulated two-party presidential vote shares in 2004 by demographic group among NAES respondents (using vote intention for pre-election respondents), then chose five each of the most heavily Republican-voting and Democratic-voting groups. Our expectations about cross-pressuredness based on the combination of these characteristics (coded "cross-pressured" for combinations of Republican and Democratic demographics, and "not cross-pressured" for pairs which both favor the same party), mean cross-pressure scores, and sample sizes are presented for each combination which comprised at least 2% of respondents. The correlation between group expectations (1 = cross-pressured, 0 = not) and mean CP scores is 0.7167 ($n = 41$).

Table 4: Applying Cross-Pressure Scores to the Study of Participation

	United States (2004 NAES)								*Poland (2001 PNES)*	
	Voter Turnout	Voter Advocacy	Campaign Donations	Political Interest	Discussion Frequency	Political Knowledge	Indifference	Alienation	Voter Turnout	Political Interest
CP Score Coefficient	-0.74*** (0.22)	-0.31*** (0.11)	-0.72*** (0.17)	-0.10*** (0.02)	-0.13*** (0.02)	-0.08*** (0.03)	12.37*** (0.63)	5.48*** (0.41)	-1.56** (0.78)	-0.67*** (0.29)
Range of Responses	Binary	Binary	Binary	1–4	1–4	0–6	0–100	0–100	Binary	1–5
Predictive Margins:										
10th percentile	91.8%	48.6%	18.8%	3.13	2.44	4.91	44.8	20.8	70.6%	2.92
50th percentile	90.0%	45.8%	15.1%	3.09	2.39	4.87	49.6	22.9	58.7%	2.65
90th percentile	88.4%	43.9%	12.8%	3.06	2.35	4.85	53.1	24.4	50.9%	2.48
n	8658	10308	9681	62616	80913	61106	73867	73867	1783	1785

*** = $p < 0.01$, ** = $p < 0.05$ (one-tailed). Dependent variable for each model listed at column heading. Turnout, advocacy, and donations in the US are taken from the post-election wave of the NAES general election panel, while all other US variables are taken from the NAES rolling cross-section (nearly all responses pre-election). Coefficients are estimated from logit regressions for binary dependent variables, and from ordinary least squares regressions otherwise; robust standard errors are given in parentheses. Predictive margins are the average predicted values of the dependent variable across all respondents with the cross-pressure score variable set at the indicated level. Each model controls for all demographics used to create CP scores, as well as presidential vote margin and dummies for Senate and gubernatorial races for US responses, and interview date for cross-sectional US responses. Using an alternative specification which also controls for party identification, political interest, and ideology does not dramatically change the results (available upon request); we choose to employ the simpler specification because these additional variables could be potential mechanisms through which cross-pressures' effects on behavior are realized. Full model results are contained in Table A3 of the online appendix (attached to manuscript for review purposes).

Online Appendix I: Calculating CP scores

The steps for calculating CP scores using US respondents in the NAES and GSS datasets (two parties) are as follows:

1. Model presidential vote for major-party voters (coded 1 = Kerry, 0 = Bush) as a function of demographics using a binary logit regression (see Table A1 of the online appendix).
2. Use these regression results to predict the probability of voting for Kerry for each respondent, then calculate the probability of voting for Bush (1 – p(vote=Kerry)).
3. Calculate the absolute difference between these probabilities, which ranges from 0 (equal probability of voting for each) to 1 (certain to vote for one candidate).
4. Subtract this difference from 1 so higher values indicate more equal probabilities.

The resulting quantity is the respondent's CP score.

For the CSES and PNES datasets, variations of this procedure are employed as described below:

- *More than two parties, "top-2 variance" method*: Use a multinomial logit regression in step 1 above, with party identification (CSES) or legislative vote choice (PNES) as the dependent variable; use the results to predict probabilities of supporting each party in step 2; across all predicted probabilities, determine the two highest for each respondent and use those in steps 3 and 4.
- *More than two parties, "top-3 variance" method*: Same as previous for steps 1 and 2; in step 3, determine the three highest predicted probabilities for each respondent and take the standard deviation across them; in step 4, scale this quantity from 0 to 1, then subtract it from 1 to generate each respondent's CP score.
- *More than two parties, "full variance" method*: Same as previous for steps 1, 2, and 4; in step 3, take the standard deviation across all parties' predicted probabilities for each respondent.

Online Appendix II: Coding of Issues and Party Preferences

The following table notes the 23 issues used to construct our measure of issue cross-pressures, the corresponding question numbers in the 2004 NAES panel dataset, and the responses which were coded as pro-Democratic and pro-Republican. These issues were chosen to cover a broad spectrum of policy questions, and because they are ones on which the parties are largely polarized and on which the parties' positions are well known. When multiple question numbers are listed below, this indicates variation in the question wording or response choices in the survey over time. As most of these changes were simply changes in response scale (e.g., from "favor/oppose" to "strongly favor/somewhat favor/etc."), the versions were condensed to remove qualifiers. Thus, for example, a response listed below as "favor" may indicate a survey response of "favor", "strongly favor", or "somewhat favor". Not all questions were asked of all respondents.

Issue / Proposal	Question Numbers	Democratic Responses	Republican Responses
Bush economic policies	ccb10	Making economy worse	Making economy better
Make Bush tax cuts permanent	ccb16, 17	Oppose	Favor
Eliminate estate tax	ccb33, 34, 35	Oppose	Favor
Increase Minimum Wage	ccb65	Favor	Oppose
Make unionization easier	ccb71, 72	Favor	Oppose
Subsidized healthcare for children	ccc03, 04	Favor	Oppose
Subsidized healthcare for workers	ccb05, 06	Favor	Oppose
Privatize Social Security	ccc32, 33	Oppose	Favor
School vouchers	ccc39	Oppose	Favor
Education spending	ccc40	More	Less, None
Military spending	ccd03	Less, None	More
Bush handling of Iraq	ccd19	Disapprove	Approve
Troops in Iraq	ccd35	Withdraw	Leave in place
Homeland security spending	ccd57	Less, None	More
Patriot Act	ccd67	Bad for country	Good for country
Banning abortions	cce01	Oppose	Favor
Make abortion more difficult	cce02	Oppose	Favor
Stem cell funding	cce07, 08, 09	Favor	Oppose
Additional stem cells lines	cce14	Favor	Oppose
Gun control	cce31	More	Less, None
Assault weapons ban	cce32, 33, 34	Favor	Oppose
Tort reform	ccg01, 02	Oppose	Favor
Malpractice reform	ccg07	Oppose	Favor

Online Appendix III: Appendix Figure and Tables

Figure A1: The Cross-Pressure Score Algorithm

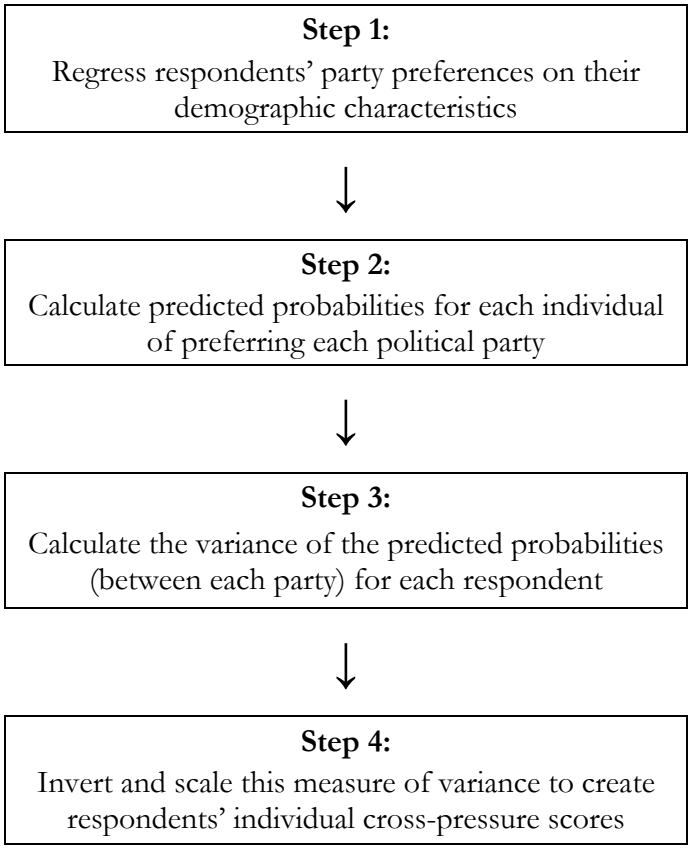


Table A1: Results of the Step One Party Preference Regression in the US

	Kerry Vote Preference
Female	0.27*** (0.02)
Age: 18-29	0.03 (0.03)
Age: 30-39	-0.11*** (0.03)
Age: 50-64	0.19*** (0.03)
Age: 65+	0.39*** (0.04)
Education: Less than HS	0.15*** (0.04)
Education: HS Diploma, No College	0.01 (0.02)
Education: 4-year Degree	0.12*** (0.03)
Education: Grad School	0.48*** (0.03)
Income: 1st Quintile	0.42*** (0.03)
Income: 2nd Quintile	0.20*** (0.03)
Income: 4th Quintile	-0.12*** (0.03)
Income: 5th Quintile	-0.26*** (0.03)
Unemployed	0.40*** (0.05)
Student	0.34*** (0.07)
Retired	0.15*** (0.03)
Government Job	0.06** (0.03)
Self-employed	-0.14*** (0.03)
Professional Job	0.13*** (0.02)
Blue-collar Job	0.12*** (0.03)
Union Member	0.61*** (0.03)
Religious Attendance: None	0.23*** (0.03)
Religious Attendance: Low	0.18*** (0.03)
Religious Attendance: High	-0.32*** (0.03)
Religious Attendance: Very High	-0.84*** (0.04)
Catholic	0.08*** (0.02)
Jewish	0.87*** (0.06)
Mormon	-0.85*** (0.08)
Muslim	1.26*** (0.22)
Orthodox Christian	0.26*** (0.11)
Other Religion	0.51*** (0.03)
Atheist	0.62*** (0.06)
Hispanic	0.33*** (0.04)
Asian	0.02 (0.09)
Native American	0.10 (0.10)
Immigrant	0.07** (0.04)
Gun-owner	-0.57*** (0.02)
Gay Friends / Family	0.13*** (0.03)
Military Household	-0.20*** (0.02)
Urban	0.22*** (0.02)
Rural	0.11*** (0.02)
Northeastern State	-0.03 (0.03)
Central / Mountain State	-0.36*** (0.03)
Western State	-0.05* (0.03)
Southern × White	-0.51*** (0.05)
Non-Southern × White	-0.32*** (0.05)
Southern × Non-white	0.08 (0.06)
Black × Evangelical	1.75*** (0.08)
Non-black × Evangelical	-0.64*** (0.02)
Black × Non-Evangelical	1.69*** (0.09)
Constant	-0.07 (0.07)
n	69439

*** = p < 0.01, ** = p < 0.05, * = p < 0.1 (one-tailed). Dependent variable = reported vote or vote intention for Kerry in 2004, among those who preferred either Kerry or Bush. Cell entries are logit coefficients, with standard errors in parentheses. Data from 2004 National Annenberg Election Survey.

Table A2: Results of the Step One Party Preference Regression in Poland

	AWSP	S	PIS	PSL	PO	LPR
Female	0.16	-0.17	-0.03	-0.20	-0.12	0.45*
	(0.39)	(0.24)	(0.27)	(0.27)	(0.22)	(0.30)
Age	0.07	0.03	0.05	-0.04	-0.04	-0.02
	(0.09)	(0.05)	(0.06)	(0.05)	(0.04)	(0.05)
Age-squared	-0.00	-0.00	-0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Education	0.35	-0.34	0.19	0.25	-0.17	-0.36*
	(0.43)	(0.29)	(0.27)	(0.28)	(0.24)	(0.26)
Education-squared	-0.02	0.01	-0.01	-0.02	0.02	0.03*
	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Income	-2.91	-1.06	1.44	0.25	2.87	2.11
	(2.35)	(2.24)	(2.48)	(2.80)	(2.77)	(3.78)
Income-squared	3.62**	0.88	-3.27	-1.18	-2.91	-7.07
	(1.77)	(2.25)	(4.63)	(4.49)	(3.75)	(8.62)
Unemployed	0.49	-0.48	0.34	-0.86*	-0.47	0.16
	(0.75)	(0.44)	(0.48)	(0.58)	(0.49)	(0.55)
Student	0.31	0.07	0.60	-1.01	-0.10	-12.85*
	(1.35)	(0.70)	(0.68)	(0.82)	(0.57)	(0.83)
Retired	0.69*	0.15	0.12	0.30	-0.57*	0.36
	(0.48)	(0.38)	(0.39)	(0.49)	(0.36)	(0.38)
Government Job	-0.24	-0.10	0.07	-0.34	-0.29	-0.24
	(0.42)	(0.28)	(0.29)	(0.31)	(0.26)	(0.35)
Self-employed	0.51	0.64**	1.15**	0.74**	0.44	0.54
	(0.60)	(0.32)	(0.40)	(0.33)	(0.35)	(0.45)
Manager	0.33	-0.12	0.16	-0.48	0.03	-0.39
	(0.43)	(0.31)	(0.30)	(0.39)	(0.27)	(0.37)
Union Member	0.40	-0.35	-1.03**	0.13	-0.40	0.64*
	(0.55)	(0.41)	(0.50)	(0.46)	(0.36)	(0.39)
Religious Attendance	-0.19	1.15**	0.59*	-0.59*	0.38	-0.14
	(0.83)	(0.57)	(0.42)	(0.40)	(0.34)	(0.45)
Attendance-squared	0.08	-0.10**	-0.02	0.08**	-0.01	0.07*
	(0.07)	(0.05)	(0.04)	(0.04)	(0.03)	(0.05)
Urban / Rural Scale	-1.31***	-0.66**	-0.08	-1.60***	-0.21	-0.77**
	(0.51)	(0.36)	(0.35)	(0.39)	(0.31)	(0.42)
Urban / Rural Scale-squared	0.20***	0.07*	0.07*	0.17***	0.07*	0.12**
	(0.07)	(0.06)	(0.05)	(0.06)	(0.05)	(0.06)
Constant	-6.17**	-2.30	-7.20***	2.11	-2.23*	-1.72
	(0.49)	(2.19)	(2.05)	(1.72)	(1.59)	(1.88)
n	950					

*** = p <0.01, ** = p < 0.05, * = p < 0.1 (one-tailed). Dependent variable = vote in lower-chamber parliamentary election for party listed at column head. Cell entries are multinomial logit coefficients, with standard errors in parentheses; base category is vote for SLD-UP coalition. Data from 2001 Polish National Election Study.

Table A3: Applying Cross-Pressure Scores to the Study of Participation (Full Version)

	United States (2004 NAES)								*Poland (2001 PNES)*	
	Voter Turnout	Voter Advocacy	Campaign Donations	Political Interest	Discussion Frequency	Political Knowledge	Indifference	Alienation	Voter Turnout	Political Interest
CP Score	-0.74***	-0.31***	-0.72***	-0.10***	-0.13***	-0.08***	12.37***	5.48***	-1.56**	-0.67***
Female	0.19**	-0.08**	-0.02	-0.22***	-0.02***	-0.17***	-2.62***	-1.31***	-0.33***	-0.42***
Age: 18-29	-0.59***	0.19***	-0.47***	-0.24***	-0.01	-0.06***	1.49***	0.73***		
Age: 30-39	-0.38***	-0.07	-0.09	-0.13***	-0.05***	-0.04***	0.97***	-0.22		
Age: 50-64	0.64***	0.24***	0.60***	0.16***	0.07***	0.03***	-4.00***	-2.02***		
Age: 65+	1.12***	0.06	0.91***	0.32***	0.03*	-0.01	-7.30***	-3.09***		
Age (years)									0.12***	0.04***
Age (years^2)									-0.00***	-0.00***
Education: < HS	-1.44***	-0.42***	-0.48***	-0.41***	-0.32***	-0.53***	1.23**	-1.64***		
Education: HS	-0.66***	-0.24***	-0.31***	-0.19***	-0.18***	-0.18***	0.28	-0.74***		
Education: BA/BS	0.56***	0.18***	0.29***	0.12***	0.09***	0.15***	-0.67**	0.11***		
Education: Grad School	0.54***	0.34***	0.39***	0.20***	0.22***	0.19***	-0.52*	1.13***		
Education (years)									0.40***	0.26***
Education (years^2)									-0.02**	-0.01***
Income: 1st Quintile	-0.96***	-0.17**	-0.82***	-0.14***	-0.14***	-0.29***	2.18***	2.02***		
Income: 2nd Quintile	-0.44***	-0.15***	-0.27***	-0.06***	-0.06***	-0.07***	1.39***	1.14***		
Income: 4th Quintile	-0.08	0.10*	-0.00	0.03***	0.03***	0.03***	-0.92**	-0.48**		
Income: 5th Quintile	0.04	0.08	0.50***	0.07***	0.12***	0.06***	-1.42***	-1.06***		
Income (monthly)									0.76	0.44*
Income (monthly^2)									0.13	-0.03
Unemployed	-0.09	-0.23**	-0.06	-0.02	0.04**	-0.04*	0.00	1.85***	-0.49***	-0.13**
Student	0.23	-0.05	0.14	0.05**	0.11***	0.15***	1.07	1.17**	1.21***	0.16
Retired	0.29*	-0.05	0.25**	0.11***	0.07***	0.04***	-2.69***	-1.07***	0.44***	0.06
Government Job	0.26**	-0.21***	-0.07	0.03***	-0.01	0.03***	0.64**	-0.31*	0.17	0.06
Self-employed	-0.06	0.22***	0.34***	0.10***	0.17***	0.04***	-3.05***	-0.66***	0.29*	0.13**
Professional/Mgmt Job	0.36***	-0.05	0.04	0.01*	0.01	0.04***	0.15	0.56***	0.08	0.15***
Blue-collar Job	-0.22**	-0.15***	-0.11	-0.08***	-0.09***	-0.07***	1.14***	0.72***		
Union Member	0.20*	0.24***	0.13*	0.03***	0.09***	0.00	-0.27	1.44***	-0.01	0.04
Relig. Attend.: None	-0.80***	-0.01	-0.06	-0.08***	-0.05***	-0.03**	-2.76***	1.61***		
Relig. Attend.: Low	-0.51***	0.03	-0.14*	-0.06***	-0.03***	-0.04***	-1.23***	0.73***		
Relig. Attend.: High	0.19	0.06	0.05	0.02**	0.02**	0.00	-2.06***	-1.42***		
Relig. Attend.: V. High	0.16	0.20***	-0.12	-0.01	0.01	-0.00	-4.01***	-2.57***		
Relig. Attend (scale)									-0.08	0.02
Relig. Attend (scale^2)									0.04***	0.00
Catholic	0.16*	-0.06	-0.14**	-0.02**	-0.00	0.00	0.94***	-0.18		
Jewish	0.07	0.02	0.14	0.05**	0.16***	0.06***	-0.89	1.49***		
Mormon	0.24	0.05	-0.55**	-0.02	-0.03	-0.06**	3.31***	-0.28		
Muslim	-1.31***	0.04	-1.25	0.00	0.22***	0.09	-0.23	4.02***		
Orthodox Christian	-0.20	0.16	0.21	-0.01	0.02	0.01	-2.39**	-0.56		
Other Religion	0.02	0.03	0.18*	-0.00	0.06***	-0.01	0.06	2.90***		
Atheist / Agnostic	-0.13	0.20*	-0.18	-0.03	0.02	-0.08***	0.95	3.17***		

Hispanic	-0.10	-0.21**	-0.12	-0.13***	-0.11***	-0.24***	3.30***	-1.15***		
Asian	-0.05	-0.24	0.66**	-0.17***	-0.24***	0.24***	7.22***	0.03		
Native American	-0.81**	0.09	-0.45	-0.08**	-0.03	0.11***	-1.91*	-0.79		
Immigrant	-1.86***	-0.22***	-0.16	-0.08***	0.05***	-0.21***	3.89***	-1.32***		
Gun-owner	0.44***	0.07*	-0.12**	0.03***	0.05***	0.00	-1.25***	-1.19***		
Gay Friends / Family	0.06	0.02	0.01	0.04**	0.06***	0.04***	-0.29	0.48***		
Military Household	0.09	0.07*	0.22***	0.05***	0.13***	0.04***	-1.34***	-0.79***		
Urban	-0.06	0.08*	-0.02	0.03***	0.04***	-0.00	-1.22***	0.15		
Rural	-0.26***	0.01	-0.11*	-0.02***	-0.02**	-0.04***	0.39	0.63***		
Urban (scale)									-0.37*	-0.04
Urban (scale^2)									0.05*	0.01
Northeastern State	-0.04	0.09*	0.09	-0.01*	0.04***	0.02*	-0.43	0.10		
Central/Mountain State	0.14	-0.01	0.03	-0.01	0.03***	0.02	-1.46***	-1.66***		
Western State	0.14	0.06	0.28***	0.00	0.10***	-0.01	-2.06***	-0.20		
Southern × White	0.05	0.21*	-0.16	0.01	0.05**	0.23***	-2.93	-4.14***		
Non-South × White	0.02	0.21**	-0.14	-0.00	-0.02	0.19***	-1.02*	-2.54***		
Southern × Non-white	0.20	0.23**	0.29*	0.01	0.09***	-0.00	-1.81***	-1.45***		
Black × Evangelical	-0.15	-0.23*	-1.00***	-0.09***	-0.14***	-0.09***	4.97***	4.29***		
Non-black × Evang.	-0.30***	0.10**	0.01	-0.01*	-0.02**	-0.02*	-1.45***	-3.00***		
Black × Non-Evang.	-0.34	0.03	-0.74***	-0.09***	-0.13***	-0.02	3.86***	4.16***		
Pres. Vote Margin	-0.14***	-0.06**	-0.07**	0.00	-0.02***	-0.02***	0.43***	0.12*		
Senate Race Dummy	0.05	0.04	-0.10*	-0.02**	-0.02**	-0.01	0.35	0.33**		
Gov. Race Dummy	0.07	0.03	0.25***	-0.01*	-0.02**	0.03**	0.49*	0.84***		
Days to Election (1-15)				-0.002	-0.014***	0.002**	-0.160***	0.045*		
Days (16-30)				-0.006***	-0.003*	-0.005***	0.209***	0.104***		
Days (31-60)				-0.000	-0.004***	-0.005***	0.015	-0.037***		
Days (61-120)				-0.001***	0.000	0.004***	0.070***	0.054***		
Days (121+)				0.001***	-0.000***	-0.010***	0.056***	0.018***		
Constant	3.45***	-0.22	-1.33***	3.38***	2.77***	5.69***	41.95***	19.65***	-3.96***	1.09***
n	8658	10308	9681	62616	80913	61106	73867	73867	1783	1785
Range of Responses	Binary	Binary	Binary	1–4	1–4	0–6	0–100	0–100	Binary	1–5
Predictive Margins:										
10th percentile	91.8%	48.6%	18.8%	3.13	2.44	4.91	44.8	20.8	70.6%	2.92
50th percentile	90.0%	45.8%	15.1%	3.09	2.39	4.87	49.6	22.9	58.7%	2.65
90th percentile	88.4%	43.9%	12.8%	3.06	2.35	4.85	53.1	24.4	50.9%	2.48

*** = p < 0.01, ** = p < 0.05, * = p < 0.1 (one-tailed). Cell entries are regression coefficients (logit for binary responses, OLS otherwise); significance calculated using robust standard errors (available upon request, omitted for brevity). Because the original varable codings and sample sizes differ between the NAES and PNES datasets, certain variables' coefficients (such as those for age and education) are reported in separate rows when their specifications (as used in our models) are substantially different between the two datasets. Dependent variable for each model listed at column heading. See text and caption of Table 4 for additional notes.

Table A4: Applying Cross-Pressure Scores Using "Core" Set of Demographics

	Voter Turnout	Voter Advocacy	Campaign Donations	Political Interest	Discussion Frequency	Political Knowledge	Indifference	Alienation
"Core" CP Score Coefficient	-0.38* (0.27)	-0.27** (0.12)	-0.54*** (0.18)	-0.09*** (0.02)	-0.11*** (0.02)	-0.08*** (0.02)	8.91*** (0.69)	2.98*** (0.44)
Range of Responses	Binary	Binary	Binary	1–4	1–4	0–6	0–100	0–100
Predictive Margins:								
10th percentile	90.7%	47.6%	17.0%	3.11	2.42	4.90	47.0	22.0
50th percentile	90.0%	45.9%	15.1%	3.09	2.39	4.87	49.5	22.8
90th percentile	89.5%	44.7%	13.9%	3.08	2.37	4.86	51.2	23.4
n	8658	10308	9681	62616	80913	61106	73867	73867

*** = $p < 0.01$, ** = $p < 0.05$, * = $p < 0.1$ (one-tailed). These models repeat those used in the analysis of participation in the US shown in Table 4, but employ an alternate specification for cross-pressure scores. This specification uses only the set of "core" demographic variables referenced in Section 4.1: gender, age, income, education, urban/rural, employment status, union membership, religious attendance (but not denomination), and military affiliation. (These models do use the full set of demographics as control variables, however, to ensure comparability with Table 4.) As noted in the text, each of these results shows an effect for CP scores which is smaller in magnitude but in the same direction as the comparable effect shown in Table 4. See caption of Table 4 for additional details on the model specifications; full results of these models are available from the authors upon request.

Table A5: Comparing Effect Sizes Across Variables

	Voter Turnout	Voter Advocacy	Campaign Donations	Political Interest	Discussion Frequency	Political Knowledge	Indifference	Alienation
Range of Responses	Binary	Binary	Binary	1–4	1–4	0–6	0–100	0–100
Predictive Margins:								
CP Score: 10th percentile	91.8%	48.6%	18.8%	3.13	2.44	4.91	44.8	22.0
CP Score: 50th percentile	90.0%	45.8%	15.1%	3.09	2.39	4.87	49.6	22.8
CP Score: 90th percentile	88.4%	43.9%	12.8%	3.06	2.35	4.85	53.1	23.4
Age: youngest 20%	83.0%	48.3%	7.7%	2.81	2.37	4.83	52.8	24.6
Age: middle 20%	88.6%	43.8%	11.6%	3.05	2.38	4.89	51.3	23.8
Age: oldest 20%	95.2%	45.3%	23.5%	3.37	2.40	4.88	44.0	20.7
Education: lowest 20%	77.2%	35.9%	9.7%	2.71	2.09	4.37	50.7	21.2
Education: middle 20%	91.4%	45.8%	14.4%	3.12	2.40	4.90	49.4	22.8
Education: highest 20%	94.2%	54.1%	19.4%	3.32	2.63	5.09	48.9	24.0
Income: poorest 20%	84.9%	42.8%	7.9%	2.97	2.26	4.64	51.1	24.4
Income: middle 20%	92.3%	46.6%	15.8%	3.12	2.40	4.93	49.0	22.5
Income: richest 20%	92.8%	49.1%	22.3%	3.19	2.53	4.99	47.6	21.4
n	8658	10308	9681	62616	80913	61106	73867	73867

These results supplement those presented in Table 4, showing the estimated values of the dependent variables across various levels of age, education, and income for each of the forms of participation modeled using US data. For each of these variables, respondents were sorted into quintiles, with the resulting values modeled as categorical variables to allow for non-linear effects. Estimates for the first, third, and fifth quintiles are presented here, to provide some context in which the predictive power of cross-pressure scores can be more readily interpreted. See caption of Table 4 for additional details on the model specifications.