

## **You Either Got It or You Don't?**

### **The Stability of Political Interest over the Life Cycle**

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### *Abstract*

Some people are more politically interested than others, but political scientists do not know how stable these differences are and why they occur. This paper examines stability in political interest. Eleven different panel surveys taken in 4 different countries over 40 years are used to measure stability. Several studies include a much larger number of interview waves—up to 23—than commonly used panels. The analysis empirically characterizes the stability of interest over time using a model that accounts for measurement error and a dynamic panel model. The large number of panel waves makes it possible to relax many restrictive assumptions to ensure robustness. With one exception (Germany reunification), political interest is exceptionally stable in the short run and over long periods of time. Hence, this study provides strong justification for efforts to understand how political interest forms among young people.

Keywords: political interest, political socialization, stability, measurement error, dynamic panel, German reunification

Some people are more interested in politics than others. Why this is so remains largely unclear, however, because political scientists have devoted little attention to studying the development of political interest. It is an important question because political interest is typically the most powerful predictor of political behaviors that make democracy work. Politically interested people are more knowledgeable about politics, more likely to vote, and more likely to participate in politics in other ways (e.g., Delli Carpini and Keeter 1996; Verba, Schlozman, and Brady 1995; Powell 1986). They are also more likely to be mobilized, and attempts to encourage political participation often have significantly greater effects on individuals who are politically interested to begin with (Brady, Schlozman, and Verba 1999; Finkel 2002). Understanding the roots of political interest is becoming more important because the effects of this kind of intrinsic motivation are growing. As new media offer vastly more content, politically uninterested people can more easily avoid news exposure than in the past, while the interested seek out more news, learn more about politics, and participate at higher rates (Prior 2005; 2007).

In light of the strong relationship between political interest and citizen involvement it is tempting to prescribe a boost in political interest as a way to improve democratic governance through a more informed public, higher rates of participation, and greater political equality. Yet political science could provide little guidance for such an effort. We do not understand where political interest comes from and could thus not recommend how to increase it. We do not even know if political interest has the stability of a personal trait or the volatility of a regularly updated reflection of the contemporary political situation. How likely is it that a politically uninterested person will develop interest in the future?

By examining the stability of political interest over people's lives, this study takes an important step toward understanding the development of political interest because it focuses our

search for explanations of political interest. If people's interest levels fluctuate, the development of political interest is likely to depend on short-term variations in context and changing attitudes towards politics. If people keep a steady interest over time, it becomes important to study the development of interest early in life.

The difference between fluctuation and steadiness in political interest corresponds to two well-known concepts in socialization research: the "persistence" of early effects versus "lifelong openness" to contextual influences and reconsideration (e.g., Alwin 1994; Sears 1983). The next section of the paper elaborates this theoretical background. I then describe six panel studies that I use to measure stability in political interest. Among them are household panels that have been largely ignored by political scientists, even though they include an unusually large number of interview waves. Whereas past analyses of stability in political attitudes use panels with no more than five waves (e.g., Feldman 1989; Green, Palmquist, and Schickler 2002), this study draws on datasets with up to 23 interviews per respondent. I empirically characterize the stability of interest over time using a model that accounts for measurement error. Due to the larger number of reinterviews, I can relax many of the restrictive model assumptions to verify the robustness of the results. Finally, I use a dynamic panel model to assess long-term stability of political interest.

### **Persistence of Political Attitudes**

If political interest reflects ongoing evaluations of politics, it might change frequently as elections and other salient political events come and go. But even when the "interestingness" of politics changes, people may not update their political interest if they do not pay much attention or have come to anticipate the political cycle. Instead, political interest may resemble a well rehearsed attitude, a personality trait, or a part of people's political identity.

Most empirical studies of the persistence of political attitudes focus on stability of party

identification, concluding that many people identify with the same party for years and even decades (e.g., Green, Palmquist, and Schickler 2002; Jennings and Markus 1984; Sears and Funk 1999). Many other political attitudes, including issue positions, group evaluations, and ideology are also very stable, at least in adulthood (Alwin 1994; Alwin and Krosnick 1991). Candidate evaluations, on the other hand, can change considerably during a campaign (Feldman 1989).

Research on the persistence of political attitudes attempts to determine not only how stable particular attitudes are, but also when they are most likely to change. Scholars (e.g., Alwin 1994; Sears and Funk 1999; Sears 1983; see also Merelman and King 1986) distinguish a persistence model according to which only early experiences influence attitudes from a “lifelong openness” model which emphasizes change throughout people’s lives as they continue to update their attitudes. Other model trajectories are mixtures of these two types, specifying the varying probability of attitude change over the course of a life time (Alwin 1994, 142-5; Sears 1983). According to one of them, the “impressionable years” model, early experiences matter disproportionately and attitudes stabilize in early adulthood.

Neither empirical stability in other political attitudes nor typologies of trajectories provide firm theoretical guidance for understanding the persistence of political interest. Low stability of political evaluations, for example, does not preclude a stable habit of political involvement because, as Merelman and King (1986, 479, 476) point out, “early learning [may produce] a lasting proclivity toward activism, coupled with strong motives to search the environment flexibly and imaginatively for a satisfying political stance.”

Sears (1983, 94-102) explains different levels of stability as a function of the attitude object. High stability emerges when the attitude object is salient, receives frequent public attention, and has constant meaning over time. The attitude object “politics” probably has the first two

attributes. (Politics can be a salient concept even to people who rarely or never think about, or participate in, politics.) Sears (1983, 102) suggests that the meaning of politics is too complex, contested, and subjective to induce persistent evaluations. But high persistence might still emerge if individuals tend to maintain their definitions of politics, even if these definitions vary widely between individuals. Likewise, if political interest is a personality trait or part of people's identity, we should expect high stability (e.g, Roberts and DelVecchio 2000; Caspi, Roberts, and Shiner 2005, 466-7).

Models of Bayesian learning offer another theoretical perspective. In political science, they have been developed predominantly to account for people's party identification and vote choice (Achen 1992; 2002; Bartels 1993; Gerber and Green 1998). In the absence of major changes in the positions or records of the parties, change in party evaluations becomes less likely as people's familiarity with the parties grows. The first pieces of information about the parties are therefore often most powerful in modifying people's party identification. The Bayesian perspective generates a similar hypothesis about the stability of political interest. In a relatively stable political system in which the meaning of politics does not change fundamentally, attitudes toward the system form early and become more stable as a consequence of mounting information about, and familiarity with, the system. Early experiences may have disproportionate influence on young people who do not yet have a sense if politics is interesting. Accumulating information strengthens and stabilizes people's evaluations, unless it clearly contradicts existing impressions.

Empirical assessments of the stability of political interest are rare and inconsistent. Tracking samples of high-school students and their parents over a period of almost two decades, Jennings and Niemi (1984) find political interest to be decidedly less stable than party attachments, self-reported church attendance or political knowledge. Drawing on the same dataset with an

additional panel wave, Shani (2009) finds political interest to be a more enduring orientation. Adults' interest is strongly influenced by their political involvement as high-school students decades earlier. The dependence on only one dataset which does not use a general population sample (see below) has so far limited generalizations about interest stability.

The goal of the following analysis is a broader assessment of stability in political interest. According to both a Bayesian learning model and the "impressionable years" view, stability should increase over the life span and become very high in adulthood unless the political system undergoes extraordinary change. This implies high stability in general population samples overall (Hypothesis 1) and noticeably greater stability among older people (Hypothesis 2). The alternative hypothesis predicts lower stability even after the "impressionable years" because new information about, and changing interpretations of, politics modify people's evaluations of its appeal. These theoretical foundations do not provide compelling arguments why interest stability should vary across developed democracies. Greater fluctuations in the valence of political information might lower stability, but reasons (or empirical evidence) for such variance across democracies is not evident. Hence, I expect stability in political interest to be similar across developed democracies (Hypothesis 3).

### **Data Sources**

To examine the stability of political interest, I draw on panel studies conducted in Western Europe and the United States spanning between 5 and 32 years. With the exception of the Jennings study, panels begin with representative samples of the country population. For Britain and Germany, two panel studies each with overlapping time periods provide a strong test of robustness to slight variation in study design and question wording.

*British Election Study (BES) Panel, 1997-2001 (Heath, Jowell, and Curtice 2002).* The BES

begins with a random sample designed to be representative of the British voting-age population (18 years and older). Each year, panelists were asked “How much interest do you generally have in what is going on in politics, a great deal, quite a lot, some, not very much, or, none at all?” Of 3,615 respondents interviewed in 1997, 2,138 completed the five waves used in this analysis.

***British Household Panel Survey (BHPS), 1991-2005 (University of Essex 2007).*** The BHPS is an ongoing annual panel study of all adults (age 16 and over) in a representative sample of British households. It began with a random sample of over 5,000 households in 1991. Each year between 1991 and 1996 and between 2001 and 2005, respondents were asked, “How interested would you say you are in politics? Would you say you are very interested, fairly interested, not very interested, or not at all interested?” No interest question was asked in the panel waves between 1997 and 2000. I use the 9,912 panel members successfully interviewed in 1991, 44 percent of whom answered all 11 political interest questions between 1991 and 2005.

***Swiss Household Panel (SHP), 1999-2006.*** The SHP is an ongoing annual household survey that started in 1999 with a random sample representing the Swiss population over 13 years of age. I use data from the first eight panel waves conducted between 1999 and 2006. Of the 7,799 people interviewed in the first wave, 2,399 participated in all eight waves. In 2004 and 2005, large refreshment samples provide new cross-sectional estimates. Each year, respondents are asked, “Generally, how interested are you in politics, if 0 means ‘not at all interested’ and 10 ‘very interested’?” Almost all respondents provided substantive answers to this question.

***German Socio-Economic Panel Study (SOEP), 1984-2007.*** The SOEP is the longest-running annual household survey in Europe. It began in 1984 with a sample of West German households (Sample A, 4,528 households) and an oversample of foreign “guestworkers” (Sample B, 1,393 households) from Turkey, Greece, Yugoslavia, Spain and Italy. In the month before reunification

of Germany in 1990, a new sample of East German households was added (Sample C, 2,179 households). I also use refreshment samples started in 1998 (Sample E, 1,067 households), 2000 (Sample F, 6,052 households), and 2006 (Sample H, 1,506 households).<sup>1</sup>

All household members age 16 and older are eligible for interviews. Each year<sup>2</sup> since the second wave in 1985, respondents have been asked, “Generally speaking, how strongly interested are you in politics: Very strongly, strongly, not so strongly, or not at all?” In all three household panels (SOEP, SHP, BHPS), original panel member continue to be interviewed even when they move to a different household (unless they move abroad).

***German Elections Panel 1994-2002 (Falter et al.).*** This panel was conducted in three waves in 1994, 1998, and 2002, all of which included the same political interest question: “How strongly interested in politics are you? Very strongly, fairly strongly, average, not so strongly, or not strongly at all?” The sampling frame for this study contained all German residents over 15 living in private households. Interviews with a representative sample were conducted in different modes (mostly phone in 1994, and mostly face-to-face in 1998 and 2002). Later waves are supplemented with respondents who completed a mail survey in 1994. While the initial mail survey was a probability sample, panel augmentation was based on age, gender, and geographical quotas. Panel weights are used to adjust for these changes.

***Jennings Panel 1965-1997 (Jennings et al. 2004).*** This dataset includes three reinterviews (in 1973, 1982, and 1997) with a sample of high school students first surveyed in 1965 and two follow-ups with their parents (in 1973 and 1982). Children who dropped out of high school before senior year were not part of the sampled population in the first wave. These high-school drop-outs made up 27 percent of their cohort. In each wave, respondents were asked the same political interest question: “Would you say you follow what's going on in government and public

affairs most of the time, some of the time, only now and then, or hardly at all?” Valid answers to all interest questions are available for 931 youth respondents and 895 parents.

## **Results**

The goal of this analysis is to determine if people have the same steady interest in politics year in, year out. I begin my analysis with an overview of aggregate political interest. Assessment of absolute, individual-level stability in actual interest—not simply in survey reports of interest—requires separating true change in political interest from response variation artificially introduced by imprecise survey instruments, the interview context, varying attention by the respondent, and simple processing errors. I accomplish this by estimating a measurement model that separates stability of true scores from measurement error. In isolation, such measurement models only tell us about relative stability: How much do people change their interest relative to one another? Perfect relative stability could coincide with absolute instability if everybody changes by the same extent. Establishing absolute stability thus requires showing both relative stability and stability in aggregate interest. Finally, I use a dynamic panel model to determine if and how fast people return to their long-term interest equilibria after reporting unusually high or low interest.

### **Aggregate Political Interest**

In the aggregate, political interest is typically very stable. The graphs in Figure 1 show average political interest in several European countries and the United States. For all datasets, responses have been transformed to a 0-100 interval. Because the development of political interest may occur differently for non-citizens, I exclude them except in the Jennings data and the SOEP immigrant sample. Figure 1 provides estimates for two kinds of populations. Solid lines in Figure 1 display cross-sectional estimates based on fresh random samples. Broken lines and unfilled symbols show estimates for panelists who answered the political interest question in all possible

waves of a study. The small differences between these two sets of estimates indicate little threat from panel effects. In the SHP, for example, panelists who completed all eight panel waves were more interested in 1999 than the average respondent, but the difference is only one eighth of a standard deviation. In the SOEP, new samples in 1998, 2000, and 2006 report essentially the same political interest levels as the panelists who completed all 23 waves of Panel A or all 18 waves of Panel C. Similarities rather than differences abound in Figure 1, not only for comparisons of panel and cross-sectional estimates, but also when comparing different countries.

[Figure 1 about here]

Figure 1a plots political interest in Britain, Switzerland, and the United States. The average Brit has “some” interest in politics according to the BES and is halfway between “not very” and “fairly” interested according to the BHPS. Over the 14 years of the BHPS, average interest is very stable. The difference between its high in 1992 and its low in 2003 is 5 points, only one sixth of the yearly standard deviation of about 30. In Switzerland, the three independent cross-sectional estimates, shown by the dark triangles, indicate almost constant aggregate interest over 7 years: 53.1 in 1999, 55.7 in 2004, and 54.8 in 2005 (with standard deviations between 28 and 29 in all three years).

Average political interest in the United States, too, is mostly stable. It declined somewhat in the 1970s, but remained roughly constant throughout the 1980s and 1990s. The trend is based on the American National Election Study (ANES) and corrected for differences in question placement by Danielle Shani (2009). Among both students and their parents in the Jennings Panel, who answered the same question as ANES respondents, political interest is higher. Neither panel begins with a random sample of the U.S. population, however: The student sample consists of high-school seniors who tend to be more interested than young people who drop out

before their senior year. The parent sample is older than the population average (and age is positively related to political interest).

At first glance, political interest in Germany, summarized in Figure 1b, appears to reveal more dissimilarities. The figure shows trends for three different populations, however. Sample A indicates an increase in interest among West Germans in the late 1980s as the Berlin Wall fell and reunification occurred. East Germans initially expressed even greater interest, according to the first wave of Sample C, which was concluded in the weeks before reunification. Most surprising, however, is the convergence of the two samples after 1991. At least in terms of political interest, East and West Germany became one country almost instantaneously—the largest difference between them after 1992 is 4 points on the 0-100 scale (in 1998).

Political interest among foreigners who moved to Germany to work without becoming citizens (so-called “guestworkers”, Sample C) remained decidedly lower than among citizens for the entire panel. A slight increase in the first half decade might be the result of time spent in the new political environment, but it levels off quickly. In the aggregate, foreigners working in Germany, just like most other populations in Figure 1, exhibit very stable levels of political interest. This is true also for the panelists in SOEP samples E, F, and H. They are omitted from Figure 1b because their trends overlap almost exactly with samples A and C. This overlap is important methodologically because it indicates that time on the panel did not change respondents’ interest levels as compared to later refreshment samples.

Like the different panel samples, fresh cross-sectional data from the SOEP show a very slight uptick in interest in the most recent decade. Political interest rises from 42.6 in 1998 (at the end of the Kohl era) to 45.6 in 2000 and 48.6 in 2006 (the first full year of the grand coalition under Chancellor Merkel). In these years, the percentage of Germans estimated to be “strongly”

or “very strongly” interested in politics was 35, 40, and 46 percent, respectively. All panel samples indicate a drop in 2007, however, so these aggregate trends should not be exaggerated.

Overall, average political interest is very stable not only in Britain, Germany, Switzerland, and the U.S., but also in several other European countries during the same time period (Kroh 2006; Martín 2005; Zuckerman, Fitzgerald, and Dasovic 2007, 39).

### **Individual-Level Stability of Political Interest**

The simplest way to gauge the stability of a variable is to calculate the percentage of respondents who give the same response at different times. The top panel in Figure 2 shows how many respondents reported the same political interest level in the first and subsequent waves. The solid line is for respondents who completed all panel waves. The dotted lined provides the same statistic for respondents who completed (at least) the two waves for which stability is assessed. If respondents with stable political interest were more likely to remain in the panel, the two lines should diverge. That they do not is another indicator for the absence of panel effects.<sup>3</sup>

The share of respondents who give the same answer ranges from about 30 to over 60 percent. Identical interest reports become less likely with increasing time between panel waves, but this drop-off is fairly modest. For example, 63 percent of respondents in the BHPS selected the same interested level in 1991 and 1992. Between 1991 and 2005, that number drops to 54 percent. In the SOEP’s Sample A (not shown), 69 percent report the same interest in 1985 and 1986. Over the 22 years between 1985 and 2007, that number is still 55 percent.

[Figure 2 about here]

The proportion of identical interest reports also depends on the number of response categories offered to the respondent. The BHPS, with four response categories, yields more stable interest reports than the British Election Study and the German Elections Panel, both of

which offered respondents five different responses. The Swiss Household Panel with its uniquely high number of 11 categories yields by far the lowest rate of matching responses.

The bottom graph in Figure 2 plots an alternative stability statistic, the percentage of respondents who changed by no more than one response category. Even on the five-category measure included in the BES, over 90 percent of the respondents changed by no more than one category over five years. The German Elections Panel shows that 85 percent of respondents changed by maximally one category over as many as eight years. Only the SHP with its eleven categories does not reach such high levels—only about 60 percent of respondents remained within one category in panel waves more than one year apart.

The implications of these results for stability are unclear. That 93 percent of the panelists remain within one category of their initial interest level 15 years (BHPS), 22 years (SOEP, not shown) and even 32 years (in the Jennings dataset) after their first interview suggests considerable stability. The modest drop in observed stability as intervals between interviews grow also points to stability. On the other hand, a .5 rate of reporting the same interest level in consecutive years (as in the first two years of the BES panel) looks more like instability. At first glance, the SHP results in Figure 2 might suggest low stability, but, according to a strong alternative interpretation, the large number of response categories creates a misleading appearance of instability. A less ambiguous characterization of stability requires a measurement model that specifies the response process more explicitly.

### **Measurement Models for Stability in Political Interest**

The analysis of stability in political interest so far has been hampered by arbitrary definitions of stability and the fact that observed stability depends on the number of response categories. This is not surprising. A wider set of options allows respondents to report smaller changes. A

respondent who does not think carefully about the question and answers in more or less random fashion hits the same category more often when there are fewer of them. Adjusting for differences in response options and random mistakes more generally requires estimation techniques that take into account measurement error.

The patterns in Figure 2 strongly suggest the presence of measurement error. For example, the probability of reporting the same political interest level in the BES in 1997 and 1998 is about .53. But if this was in fact the stability of political interest over the course of one year, then we should expect the probability of reporting the same interest level after  $n$  years to be about  $.53^n$ , or  $.53^4 = .079$  between 1997 and 2001 in the BES. Yet, empirically this probability is .48. Stability does not decline as steeply over time as the low yearly values in Figure 2 would imply.

Many aspects of survey data collection could produce measurement error. Respondents' attention to the interview and their effort in considering the question may differ from year to year and from respondent to respondent. A panelist with true political interest right between two response categories (e.g., a BHPS respondent who is more than "fairly interested" but not quite "very interested") might go back and forth between the two closest categories, even though her interest remained constant. Her responses would not indicate change in political interest, but rather measurement error induced by an imperfect question. Most questions in the surveys used here refer to "politics" without further definition. If a respondent has different aspects of politics in mind in different panel waves, measurement error arises that is likely to attenuate stability estimates. It is impossible to enumerate all sources of measurement error, but with certain general assumptions about its nature, the impact of measurement error can be modeled.

The purpose of the following analysis is to distinguish true change in political interest from variation introduced by measurement error. An interest response is a combination of the

respondent's "true" political interest,<sup>4</sup> which we cannot observe (and is therefore referred to as a latent variable), and measurement error. Respondents' interest report  $y_t$  in panel wave  $t$  is a function of their latent political interest  $\pi_t$  and an error term  $\varepsilon_t$  with mean zero and variance  $\sigma_{\varepsilon_t}^2$ :

$$y_t = \lambda_t \cdot \pi_t + \varepsilon_t \quad (1)$$

The relationship between latent political interest at different times is expressed in the structural part of the model. In a Markov or lag-1 model, political interest at wave  $t$  depends only on political interest in the preceding wave and a structural disturbance term  $\delta_t$ :

$$\pi_t = \beta_{t-1,t} \cdot \pi_{t-1} + \delta_t \quad \text{for } t = 2, 3, \dots, T \quad (2)$$

$$\pi_t = \delta_t \quad \text{for } t = 1 \quad (3)$$

Stipulating a Markov model implies that, after political interest at  $t-1$  is taken into account, political interest at  $t$  does not depend on earlier political interest (at  $t-2, t-3, \dots$ ). The intercept is eliminated by expressing  $y_{1,2,\dots,T}$  as deviations from wave means. The structural disturbance indicates that current latent political interest is not perfectly predicted by past latent interest. The mean of  $\delta_t$  is assumed to be zero. Its variance  $\sigma_{\delta_t}^2$  is estimated. The  $\beta$  coefficients represent the strength of the relationship between latent political interest in subsequent waves. The disturbance terms are assumed to be uncorrelated with each other [ $E(\delta_t, \delta_s) = 0$ , for  $t \neq s$ ] and with latent interest in previous waves [ $E(\delta_t, \pi_s) = 0$ , for  $t > s$ ]. The error terms are assumed to be uncorrelated with the latent variables [ $E(\varepsilon_t, \pi_t) = 0$ ] and the disturbance terms [ $E(\varepsilon_t, \delta_t) = 0$ ].

Additional assumptions are necessary to estimate the model when the number of panel waves is low. For three panel waves, the model in equations (1) – (3) has more unknown parameters than there are data points (Achen 1975; Wiley and Wiley 1970). The variance-covariance matrix used in the estimation has six elements (the variances of the observed political interest measures and their covariances). Even when the error terms are assumed to be

uncorrelated [ $E(\varepsilon_t, \varepsilon_s) = 0$ , for  $t \neq s$ ], two stability coefficients ( $\beta_{1,2}, \beta_{2,3}$ ), the variances of the three disturbances terms ( $\sigma_{\delta_1}^2, \sigma_{\delta_2}^2, \sigma_{\delta_3}^2$ ), three error variances ( $\sigma_{\varepsilon_1}^2, \sigma_{\varepsilon_2}^2, \sigma_{\varepsilon_3}^2$ ), and the three  $\lambda_t$  coefficients add up to eleven unknown parameters of the model.

Wiley and Wiley (1970) identified the model by assuming measurement error variances to be constant over time ( $\sigma_{\varepsilon_1}^2 = \sigma_{\varepsilon_2}^2 = \sigma_{\varepsilon_3}^2 = \sigma_{\varepsilon}^2$ ). Fixing  $\lambda_t = 1$  for  $t = 1, 2, 3$ , which assigns the latent variable the same scale as the observed variable, reduces the number of parameters to be estimated to six, so the model is just-identified. (See Heise 1969, for an alternative, more restrictive identification strategy.) Below I estimate stability in political interest using Wiley and Wiley's (1970) identification assumptions as a baseline. But several of these assumptions are critical and arguably not realistic (e.g., Achen 1983; Finkel 1995). Error variances may decline over time if respondents become more familiar with the question as they answer it repeatedly. Measurement error may be correlated across waves if respondents are uncertain about, or confused by, the same elements of the question in repeated waves. What looks like stability of the underlying variable may in fact be stability of the error component. With more than three panel waves, the assumptions of equal error variances and uncorrelated measurement errors can be relaxed and empirically assessed. For example, examining the stability of people's issue preferences over five interviews in 1976, Feldman (1989) evaluates the assumption of equal error variances. He finds a drop in error variances in the last two panel waves.

Even with only three panel waves, the assumption that measurement errors are uncorrelated across panel waves can be relaxed (Wiley and Wiley 1974), but other parameters have to be constrained. Palmquist and Green (1992) argue that with three waves of panel data correlated measurement error models can be estimated only with excessive statistical imprecision that makes them uninformative. Estimates gain precision with additional panel waves. Palmquist and

Green find measurement error in party identification to be uncorrelated over five panel waves (in one year). For presidential approval, the same dataset reveals correlated measurement errors. (Both analyses constrain the stability coefficients to be equal over time.) Feldman (1989) allows, but does not find evidence for, correlated errors in his analysis of issue preferences.

Several of the panel studies used in this paper have many more than five waves, the maximum number in Feldman's (1989) and Palmquist and Green's (1992) analyses. As a result, the assumptions of equal error variances and uncorrelated measurement errors can be relaxed simultaneously without imposing constraints on the stability coefficients. Even with more panel waves, the error variances for the first and last wave and the first stability coefficient are not simultaneously identified (Werts, Jöreskog, and Linn 1971). This implies that the correlation between errors in waves 1 and 2 and in waves  $T-1$  and  $T$  cannot be estimated separately.

### **Measurement Error and Stability in Political Interest**

The first sets of estimates in Table 1 (BHPS, BES, SHP), Table 2 (SOEP Samples A, E, and F), and Table 3 (SOEP's East German and guestworker samples) show stability estimates with the standard Wiley-Wiley (1970) assumptions of equal error variances and uncorrelated errors.

Models are estimated on weighted data using robust ML estimation in EQS. Except in the SHP, political interest is measured on scales with four or five response categories. Not surprisingly, initial analyses indicate violations of the multivariate normality assumption. I used two different estimation methods that offer some robustness against such violations. The arbitrary distribution generalized least squares (AGLS) estimator does not require any assumption about the distribution of (continuous) variables, but works well only with very large samples. Robust maximum likelihood (robust ML) estimation corrects test statistics and standard errors obtained under the normality assumption. It is less dependent on sample size. As both estimators produced

almost exactly the same estimates, I only report results for one of them (robust ML).<sup>5</sup>

[Tables 1 - 3 about here]

One advantage of panels with more than three waves is the model's overidentification which allows an assessment of model fit. Several measures of model fit indicate that the uncorrelated error model with constant error variances fits the data well in most cases. The Comparative Fit Index (CFI) and the Root Mean Square Error of Approximation (RMSEA) suggest an excellent fit for most models in Tables 1, 2, and 3. The CFI assesses model fit relative to an independence model. Values close to 1.00 indicate good fit. The RMSEA, recommended by several scholars (see Byrne 2006, 99-100), assesses the fit between the model and the covariance matrix, taking into account the number of parameters in the model. It is estimated with a confidence interval that expresses the imprecision of estimates due to sampling error. Values below .05 are typically considered indicative of a very good fit. Tables 1, 2, and 3 show that RMSEA point estimates are close to their theoretical minimum for all models and have fairly narrow confidence intervals.

Despite these good fit statistics, model fit can be further improved. For the BHPS, the SHP, and SOEP Samples B and E, corrected  $\chi^2$  tests indicate a (marginally) significant difference between the observed covariance matrix and the covariance matrix implied by the model. Next, I test if relaxing assumptions of equal error variance and uncorrelated errors improves the model fit (and changes conclusions about stability).

Lagrange Multiplier (LM) tests implemented in EQS (Bentler 2006, 159-84) are used to check if error variances are equal in consecutive panel waves. They indicate several violations in all samples. Removing violated constraints produces the variance estimates in the second column of each model in Tables 1, 2, and 3. Earlier waves tend to generate higher error variances, a result consistent with the notion that panelists become more familiar with the task of indicating

their political interest on a fixed response scale. The SOEP's Sample E (Table 3) illustrates this pattern nicely, with error variances dropping to barely half their initial value after the first two waves. (As noted above, the error variance for the first panel wave cannot be estimated separately when the stability coefficients and structural disturbance terms are unconstrained.)

LM tests also identify at least one error covariance in each dataset that might differ from zero. Tables 1, 2, and 3 list these covariance estimates. Using robust standard errors, only three of them are statistically different from zero.<sup>6</sup> The largest significant error correlation emerges in SOEP Sample C with error terms in waves 6 and 7 correlated at .16.

For 5 of the 8 models, the less constrained specification improves model fit, producing significantly lower (corrected)  $\chi^2$  test statistics.<sup>7</sup> All models now have insignificant  $\chi^2$  test statistics, indicating a very close model fit. Substantively, however, relaxing standard model assumptions does not make much of a difference. Stability coefficients rarely change by more than .02. Where they change by more, changes are mostly in the direction of greater stability. The first two coefficients in SOEP Samples C and E, for example, increase by about .08 on average. For political interest, it is clearly not the case that stability estimates assuming uncorrelated measurement errors were inflated by unmodeled stability in errors.<sup>8</sup>

With few exceptions, political interest is extremely stable. Of the 58 stability coefficients in Tables 1 and 2 for panel waves that occurred one year apart, only 10 have 95% confidence intervals that do *not* include 1.0.<sup>9</sup> (And 6 of these 10 coefficients assess stability between the first two or the last two panel waves for which error variances cannot be estimated separately.)

Although they are generally less interested in politics than German citizens, guestworkers and their families, too, exhibit high stability. Stability estimates for Sample B bounce around more due to its smaller size, but average yearly stability is .98. The Jennings parent panels and the

German Elections Panel have only three waves, so the validity of assumptions cannot be tested. Nonetheless, these panels add valuable evidence because they span longer periods of time. With standard Wiley-Wiley (1970) assumptions, stability estimates for the German Elections Panel are .72 and .81 (and an error variance of 230 with N=1390). Jennings' 3-wave parent panel generates stabilities of .65 and .94 (with error variance of 400, N=895). These estimates reflect stability over different periods of time. To transform the coefficients into a comparable metric, the implied yearly stabilities can be calculated. They are .92 ( $= .72^{1/4}$ ) and .95 in the German Elections Panel, and .95 and .99 in the Jennings parent panel. Stability coefficients in the Jennings student panel are .90, .85, and .97 with standard assumptions (with error variance of 335 and N=931), which implies yearly stabilities of .99, .98, and 1.00.

It is important to reiterate that measurement error models do not necessarily produce high stability estimates. Using the same general model, Feldman (1989), for example, finds low stability in candidate evaluations over the course of a campaign, and Green et al. (2002, 74) show only moderate stability in presidential approval. The present analysis, too, indicates lower stability in one instance. Average yearly stability among East Germans between 1990 and 1993 is only .90. A disruption as momentous as the disappearance of their state does prod citizens to reconsider their interest in the political system. But they do so quickly: Political interest among residents of former East Germany becomes very stable after 1993—just as stable as in the West.

Figure 3 illustrates the difference that measurement corrections make for assessing stability in political interest. For five of the longest panel studies, Figure 3a plots stability coefficients from OLS models that do not correct for measurement error. Figure 3b shows stability estimates for the same studies based on the measurement error models in Tables 1 and 2. Graphs show unstandardized coefficients transformed to yearly stabilities for longer gaps between panel

waves.<sup>10</sup> Without taking into account measurement error, apparent stability is not only lower, but differs in inexplicable ways across countries and over time. When measurement error is accounted for in Figure 3b, what looks like greatly varying rates of change in political interest across countries, time periods, and surveys turns out to be universally high stability.<sup>11</sup>

[Figure 3 about here]

Analyses of 11 different panel datasets thus yield a consistent result: In the absence of major turmoil, such as German reunification, people maintain a very stable level of political interest relative to their fellow citizens. In conjunction with the mostly steady mean levels of political interest evident in Figure 1, high stability coefficients suggest the conclusion that political interest is very stable at the individual level even in an absolute sense. Occasionally, however, events such as a close election, a stimulating political discussion, or the fall of the Berlin Wall spur people's interest (or depress it, in the case of uninspiring events.) When this happens, people's subsequent interest development gives us another perspective on the distinction between interest as a stable personal characteristic and interest as a running evaluation that is updated by salient events. A dynamic panel model provides a way to determine which type of development is more common.

### **The Dynamics of Political Interest**

A dynamic panel model treats person  $i$ 's political interest in year  $t$ ,  $y_{i,t}$ , as a function of her interest in the preceding year,  $y_{i,t-1}$ , an individual-specific mean level of interest,  $\alpha_i$ , and deviations  $u_t$  and  $\varepsilon_{i,t}$ :

$$y_{i,t} = \gamma \cdot y_{i,t-1} + u_t + \alpha_i + \varepsilon_{i,t} \quad (4)$$

$u_t$  captures deviations that affect all respondents equally in year  $t$ .  $\varepsilon_{i,t}$  is a person-specific disturbance term assumed to be randomly distributed with mean zero and serially uncorrelated. A

person's long-term equilibrium level of interest is  $\alpha_i/(1-\gamma)$ . The parameter  $\gamma$  indicates how long a deviation from equilibrium persists. A value of zero for  $\gamma$  would imply that last year's political interest  $y_{i,t-1}$  has no effect on this year's political interest after accounting for a person's long-term interest (because  $\alpha_i/(1-\gamma) = \alpha_i$  if  $\gamma=0$ ) and the effect of contemporary disturbances. However much an unusual event raises a person's interest, the effect subsides within a year if  $\gamma=0$ . Absolute values of  $\gamma$  greater than zero indicate persistence of past disturbances so that idiosyncratic events of years past continue to have reverberating effects on current interest. If  $\gamma$  is close to one, people do not return to their previous interest level at all, so it would be misleading to think of political interest as a stable trait.

The dynamic panel model thus speaks to long-term stability in political interest. It has little to say about stability from one year to the next. Even if  $\gamma$  is zero, frequent and large disturbances may generate low year-to-year stability in interest. Whereas the Wiley-Wiley measurement model expresses (relative) stability directly as correspondence between interest reports in consecutive time periods, the dynamic panel model provides information about stability by assessing if and how fast interest returns to a person's equilibrium after a disturbance.

I estimate the model in equation 4 using the generalized method-of-moments (GMM) estimator developed by Arellano and Bond (1991). This estimator differences equation 4 to remove the effects of unobserved heterogeneity by eliminating the individual intercepts  $\alpha_i$ . It then instruments the differenced values of  $y$  in order to account for the correlation between  $\Delta y_{i,t-1}$  and  $\Delta \varepsilon_{i,t}$  (where  $\Delta$  is the difference operator.). Lagged values of  $y$  serve as instruments. The Arellano-Bond estimator is downward biased for highly persistent data, but can be justified here by the expectation of a low  $\gamma$  (see, e.g., Bond 2002; Green, Palmquist, and Schickler 2002, 59-63; Wawro 2002).

Estimates of  $\gamma$  and specification tests for the Arellano-Bond GMM estimator are shown in Table 4 for the BHPS, SHP, and SOEP samples. If errors  $\varepsilon_{i,t}$  are serially uncorrelated, the errors in the differenced model should exhibit negative first-order, but no second-order, autocorrelation (Arellano and Bond 1991). As Table 4 shows, this specification test is met in all but one instance (slight AR(2) autocorrelation for Sample A of the SOEP). A second test for error autocorrelation, the Hansen test, examines the null hypothesis that the overidentifying restrictions of the model are valid. Unlike the related Sargan test, the Hansen test is robust to heteroscedasticity in  $\varepsilon_{i,t}$  (Roodman 2009). With one exception, Hansen tests do not reject the overidentifying restrictions. Specification violations could be caused by using too many (weak) instruments. The large number of panel waves particularly in the SOEP makes many lagged dependent variables available as instruments (up to 231, in Sample A), some of which are weak because of long lags. This risks bias in the coefficient estimates and the Hansen test statistic through overfitting of the endogenous variables (Wawro 2002, 38). The right half of Table 4 reports results when only the three most proximate lags are used as instruments. All specification tests are now met.

[Table 4 about here]

With a limited number of instruments, estimates of  $\gamma$  unambiguously support the notion of long-term stability in political interest. Five out of seven estimates are not statistically different from zero. The two exceptions are marginal and obtained for the SOEP samples of East Germans and immigrants. The average  $\gamma$  is .034 with all instruments, .025 with restricted instruments, and .021 when the latter estimate is weighted by the number of panelists. The largest yearly departure,  $u_t$ , was 12 points (in East Germany in 1991). Estimates of  $\gamma$  imply that the remaining effect of a shock of this magnitude would be less than .3 points a year later.

Estimates of  $u_t$  (not shown) indicate the magnitude of yearly shifts in interest. The

descriptive data in Figure 1 indicate few big shifts, and the dynamic panel analysis confirms this conclusion. The 12-point shock in East Germany in 1991 is an exception. Out of 85 year dummies in the models in Table 4, 26 are greater than 3 points and 11 greater than 5 points. Of these 11 largest departures, 4 occurred early in the SOEP immigrant samples and another 3 occurred among German citizens in 1990-1. Elections typically do not cause interest to change much: Leaving out 1990 and 1991 in Germany, the average departure from equilibrium interest among citizens in Britain, Germany, and Switzerland was only 3.0 points in election years, compared to 1.8 points in other years.<sup>12</sup> In the absence of extraordinary political upheaval, political interest among citizens looks like a stable personal characteristic with only a few fleeting ups and downs. And when, for whatever reason, people are more or less interested than usual, they return to their long-term personal equilibrium level of interest within a year, if not more quickly.

### **Variation in Stability of Political Interest**

So far, I have examined stability of political interest among all panelists. Based on some Bayesian learning models and the typical “impressionable years” trajectory of persistence, my second hypothesis predicted lower stability among young people. For datasets with a sufficient number of panelists, the lower half of Table 4 reports estimates of the dynamic panel model in equation 4 for panelists who were not yet 22 years old at their first interview. There is little indication that young people’s political interest is less stable in the long run. Estimates of  $\gamma$  are not statistically different from zero for any dataset. The test is less powerful due to the reduced sample sizes, and estimates are on average .02 higher than in the respective full samples, but values of  $\gamma$  still imply a very quick return to equilibrium interest.

There are only minor age differences in the measurement error model as well. Since only

respondents with complete panel participation provide data for those models, I compared panelists under 30 at the beginning of the panel to older panelists. Empirically violated assumptions were relaxed separately for each age group. In the BHPS, panelists under 30 were significantly more likely to change between two pairs of waves. A model that allows for age differences produces significant improvement in model fit (adjusted difference-in- $\chi^2 = 36.1$  [10],  $p < .001$ ), but the average yearly stability is still .973 for panelists under 30, compared to .987 for the older group.<sup>13</sup> The Swiss data provide marginally significant, but substantively modest support for greater stability among older people. In the SHP, average yearly stability is .941 under the age of 30 compared to .977 for age 30 and above ( $\Delta\chi^2 = 12.7$  [7],  $p = .08$ ).

In Sample A of the German SOEP, there are 13 age differences of .05 or greater, but 6 of them indicate *greater* stability among panelists under 30. Average stability is the same (.98) in both age groups. The same is true for Sample C. In Sample F, stability for respondents under 30 averages 1.00, slightly higher than for older panelists (.98). Over-time differences in average interest were not noticeably larger in the young age group than in the full samples. Across studies, Hypothesis 2 thus receives little support. Young people do not exhibit systematically greater short-term or long-term volatility in political interest.

### **Conclusion**

Political interest is a strong predictor of many important political behaviors, but we do not know why some people are more politically interested than others. In this study, I have begun to address this question by investigating the stability of people's interest over time. I used three complimentary methodological approaches to characterize stability: aggregate trends, a measurement model, and a dynamic panel model. Put together, these analyses indicate exceptionally high absolute stability in political interest both from year to year and in the long

run. With only one exception—Germany in the period after reunification—average levels of interest changed very little over many years in the countries examined here. After accounting for measurement error, relative interest levels are very stable as well. Omitting the first three estimates after reunification in the East German sample, average yearly stability is .978. Visually, high stability is evident in the clustering of estimates near 1.0 in Figure 3b.<sup>14</sup> Dynamic panel models show that people return to their stable long-term political interest levels quickly after perturbations caused by political or personal events. In short, political interest behaves like a central element of political identity, not like a frequently updated attitude.

Past applications of measurement models in political science were limited to panel studies with at most five waves. Several datasets used in this study include three or four times as many waves and reduce the dependence on restrictive assumptions further. For example, panelists who answer the same questions repeatedly over the years might become more comfortable with the format and make fewer arbitrary errors in selecting their response. When the assumption of constant variance in the error terms is relaxed, variances do tend to be higher in the early waves of a panel. The assumption of uncorrelated measurement errors is also difficult to justify because respondents who misunderstand the interest question or do not find an appropriate response option in one wave may well experience the same problem again in the future. Yet even though less restrictive assumptions improved the empirical fit of the models and provided some evidence for non-constant error variances and correlated errors, they did not change the main result of high relative stability.

The conclusion that political interest is stable once appropriate corrections for measurement error are made is potentially challenged more strongly by questions about the source and meaning of “random error.” Following Zaller’s (1992) model of political issue attitudes,

response instability could arise because panelists do not unambiguously know their own political interest. Instead they construct an interest report on the spot based on the considerations about “politics” that come to mind. Asked the same question again later, they might think of other considerations and report a different level of political interest. According to Zaller (1992, 64), this response process leads to “a fair amount of purely chance variation around a stable central tendency.” Importantly, however, true ambivalence in evaluations of “politics”, not technical measurement error, generates the random variation in this theory of the survey response.

This alternative interpretation raises doubts about the statistical correction for measurement error. If people act based on the considerations that are salient to them at the time—and if different aspects of “politics” are of different interest to them—then “measurement error corrections” risk removing substantively meaningful variation. This year, “politics” might make you think of policy problems, which leads you to report high interest and get involved in addressing the problems. Last year, in contrast, “politics” might have made you think of broken campaign promises, which led you to report low interest and take a time-out from politics. In this case, it would be a mistake to dismiss the year-to-year response variation as random noise, even if you report low interest again next year and the up-and-down looks random to a measurement model. Ultimately, the extent to which variation in interest is in fact substantively (rather than statistically) random cannot be determined by a measurement model. Such questions require more direct examination of why panelists give different responses at different times.

Comparison of stability estimates based on different datasets does strongly suggest that at least some of the variation in political interest is in fact nothing more than error. In the estimates that ignore measurement error in Figure 3a, at least four patterns defy easy theoretical explanation: Political interest in Switzerland is more stable than political interest in Britain.

Stability among a cohort of Americans who were in high school in 1965 is decidedly higher than stability in all European countries. Stability in Britain jumps in the late 1990s, only to return to its previous levels right away. Stability is 20 percent higher in the German Elections Panel than in SOEP Sample A even though both surveys sampled the same population and covered an overlapping time period. There might be complex theories that predict just such differences (although the last two seem particularly difficult to explain). Measurement error is by far the most parsimonious explanation in this case, however. When error is accounted for in Figure 3b, what looked like greatly varying rates of change in political interest across countries, time periods, and surveys turns out to be consistent stability in 11 different panel surveys taken in 4 different countries over roughly 40 years.

The period leading up to German reunification saw an increase in political interest in West Germany. Interest then dropped in both parts of the newly unified country. In the East, 50 percent were “strongly” or “very strongly” interested in politics in 1990. By 1992, that share was down to 31 percent. This is by far the largest change in aggregate political interest found in this study. (As indicated by the relatively low individual-level stability coefficients for SOEP Sample C in this period, East Germans changed not only in the aggregate, but also relative to each other.) The share of “strongly” or “very strongly” interested Germans in the West increased by 11 percentage points between 1987 and 1991, only to drop by the same amount the next year. The fall of the Berlin Wall may have changed political interest by systematically altering the meaning of “politics” in a way suggested by Sears (1983). But the aggregate shifts in Germany around reunification are clearly exceptions. In most countries, most of the time, political interest was extremely stable in relative and absolute terms.

If political interest is not only a powerful predictor of political involvement but also fairly

stable over time, it may explain why political behaviors occur with remarkable regularity. Most people either go to the polls regularly or abstain regularly (Gerber, Green, and Shachar 2003; Green and Shachar 2000; Plutzer 2002; Sigelman 1982). Some scholars have interpreted this result to indicate a “habit” of voting. Instead, voting itself may not be a habit, but the consequence of habitual (i.e., stable) interest in politics. This alternative explanation matters for how we view citizens. If voting is a habit, voters appear ritualistic and perhaps even unthinking in their participation. If, on the other hand, the underlying political interest is stable, voting constitutes a deliberate and purposeful reaffirmation of the motivation to participate. Treating voting as a habit focuses explanations of participation on understanding behavior. The finding that political interest is so stable should shift attention to the development of motivation.

This study has clear implications for future work on political interest. Most of the variation in adult political interest is between-person variation. In order to figure out why political interest is higher among some people than others, it is necessary to understand how it forms in the first place. The stability of interest even among people in their twenties indicates that this formation happens quickly. Given the importance of political interest for democratic governance, it is worth examining in more detail how interest develops in childhood and adolescence.

Table 1. Measurement Models for Stability in Political Interest (UK and Switzerland)

	BHPS		SHP		BES	
	(1)	(2)	(1)	(2)	(1)	(2)
$\beta_{1,2}$	.93 (.02)	.95 (.02)	.90 (.02)	.92 (.02)	.82 (.03)	.84 (.03)
$\beta_{2,3}$	1.01 (.01)	1.01 (.02)	.92 (.02)	.93 (.02)	1.02 (.03)	1.04 (.03)
$\beta_{3,4}$	.96 (.01)	.96 (.02)	1.00 (.02)	1.00 (.02)	.97 (.02)	.96 (.02)
$\beta_{4,5}$	.98 (.01)	.98 (.01)	1.02 (.02)	1.02 (.02)	.97 (.03)	.98 (.02)
$\beta_{5,6}$	1.00 (.01)	1.00 (.01)	.95 (.02)	.96 (.02)		
$\beta_{6,7}$	.87 (.01)	.88 (.02)	.98 (.02)	.98 (.02)		
$\beta_{7,8}$	1.00 (.01)	1.00 (.02)	1.01 (.02)	1.01 (.02)		
$\beta_{8,9}$	1.02 (.01)	1.02 (.02)				
$\beta_{9,10}$	1.01 (.01)	1.00 (.01)				
$\beta_{10,11}$	.94 (.01)	.95 (.01)				
var	$\varepsilon$ : 233 (4)	$\varepsilon_{1-2}$ : 249 (8) $\varepsilon_3$ : 223 (7) $\varepsilon_4$ : 250 (7) $\varepsilon_5$ : 225 (7) $\varepsilon_{6-11}$ : 240 (3)	$\varepsilon$ : 130 (2)	$\varepsilon_{1-3}$ : 143 (4) $\varepsilon_4$ : 138 (5) $\varepsilon_5$ : 129 (5) $\varepsilon_6$ : 107 (5) $\varepsilon_{7-8}$ : 131 (5)	$\varepsilon$ : 156 (7)	$\varepsilon_{1-2}$ : 171 (8) $\varepsilon_{3-5}$ : 156 (7)
covar		$\varepsilon_{2,3}$ : 13 (6) $\varepsilon_{4,5}$ : 15 (6) $\varepsilon_{5,6}$ : 15 (6) $\varepsilon_{9,10}$ : 12 (6)		$\varepsilon_{5,6}$ : 7 (4)		$\varepsilon_{3,4}$ : 12 (7)
Corr. $\chi^2$	58.6	30.1	27.6	6.1	6.6	2.2
df	44	36	20	15	5	3
p-value	.07	.75	.12	.97	.25	.54
CFI	1.00	1.00	.99	1.00	1.00	1.00
RMSEA	.009	.000	.013	.000	.012	.000
[90% c. i.]	[.000; .014]	[.000; .008]	[.000; .024]	[.000; .017]	[.000; .035]	[.000; .033]
N	4275	4275	2222	2222	2089	2089

Note: Estimates use post-stratification weights. Models are estimated by robust maximum likelihood. Satorra-Bentler scaled  $\chi^2$  and robust standard errors are reported. Analyses of citizens only.

Table 2. Measurement Models for Stability in Political Interest (German SOEP, Samples A, E, F)

	Sample A (1985-2007)		Sample E (1998-2007)		Sample F (2000-2007)	
	(1)	(2)	(1)	(2)	(1)	(2)
$\beta_{85,86}$	.93 (.04)	.95 (.04)				
$\beta_{86,87}$	.93 (.04)	.93 (.04)				
$\beta_{87,88}$	.97 (.04)	.97 (.03)				
$\beta_{88,89}$	1.00 (.04)	1.00 (.04)				
$\beta_{89,90}$	1.01 (.04)	1.01 (.04)				
$\beta_{90,91}$	.95 (.03)	.95 (.03)				
$\beta_{91,92}$	.96 (.03)	.96 (.03)				
$\beta_{92,93}$	.96 (.03)	.95 (.03)				
$\beta_{93,94}$	1.03 (.03)	1.06 (.03)				
$\beta_{94,95}$	.95 (.03)	.95 (.03)				
$\beta_{95,96}$	.98 (.03)	.99 (.03)				
$\beta_{96,97}$	.96 (.03)	.94 (.03)				
$\beta_{97,98}$	1.03 (.03)	1.04 (.03)				
$\beta_{98,99}$	.97 (.03)	.96 (.03)	.85 (.07)	.95 (.12)		
$\beta_{99,00}$	.97 (.03)	.97 (.03)	.90 (.05)	.98 (.06)		
$\beta_{00,01}$	.98 (.03)	.99 (.03)	.99 (.06)	.99 (.06)	1.02 (.02)	1.03 (.02)
$\beta_{01,02}$	1.03 (.03)	1.03 (.03)	1.02 (.06)	1.03 (.06)	.93 (.02)	.94 (.02)
$\beta_{02,03}$	1.00 (.03)	1.00 (.03)	.94 (.05)	.92 (.05)	1.01 (.02)	1.00 (.02)
$\beta_{03,04}$	.94 (.02)	.94 (.02)	.89 (.06)	.92 (.06)	.99 (.02)	1.00 (.02)
$\beta_{04,05}$	1.01 (.03)	1.00 (.03)	1.09 (.05)	1.06 (.05)	.97 (.02)	.97 (.02)
$\beta_{05,06}$	1.00 (.03)	1.01 (.03)	1.01 (.05)	1.02 (.05)	.94 (.02)	.95 (.02)
$\beta_{06,07}$	.94 (.02)	.94 (.02)	.94 (.05)	.94 (.05)	.96 (.02)	.95 (.02)
var	$\varepsilon$ : 191 (6)	$\varepsilon_{1-8}$ : 201 (9) $\varepsilon_9$ : 229 (16) $\varepsilon_{10-12}$ : 163 (8) $\varepsilon_{13-16}$ : 198 (8) $\varepsilon_{17-20}$ : 181 (8) $\varepsilon_{21}$ : 226 (23) $\varepsilon_{22-23}$ : 180 (13)	$\varepsilon$ : 229 (19)	$\varepsilon_{1-2}$ : 305 (55) $\varepsilon_{3-10}$ : 163 (8)	$\varepsilon$ : 220 (7)	$\varepsilon_{1-6}$ : 226 (8) $\varepsilon_{7-8}$ : 189 (10)
covar		$\varepsilon_{8,9}$ : 19 (10) $\varepsilon_{9,10}$ : -9 (13) $\varepsilon_{11,12}$ : -11 (9) $\varepsilon_{12,13}$ : 12 (8) $\varepsilon_{14,15}$ : 11 (9) $\varepsilon_{15,16}$ : 10 (8) $\varepsilon_{19,20}$ : 10 (8)		$\varepsilon_{5,6}$ : 23 (20) $\varepsilon_{6,7}$ : -22 (20) $\varepsilon_{7,8}$ : 21 (19)		$\varepsilon_{2,3}$ : -10 (10) $\varepsilon_{5,6}$ : 11 (9)
Corr. $\chi^2$	235.7	185.4	42.0	35.1	23.7	11.6
df	230	217	35	31	20	17
p-value	.38	.94	.19	.28	.25	.82
CFI	1.00	1.00	1.00	1.00	1.00	1.00
RMSEA	.004	.000	.017	.013	.007	.000
[90% c. i.]	[.000; .010]	[.000; .002]	[.000; .033]	[.000; .032]	[.000; .015]	[.000; .008]
N	1978	1978	733	733	4405	4405

Note: Models are estimated by robust maximum likelihood with post-stratification weights. Satorra-Bentler scaled  $\chi^2$  and robust standard errors are reported. Analyses of citizens only.

Table 3. Measurement Models for Stability in Political Interest (German SOEP, Samples B, C)

	Sample B (1984-2007)		Sample C (1990-2007)	
	(1)	(2)	(1)	(2)
$\beta_{85,86}$	.77 (.14)	.79 (.18)		
$\beta_{86,88}$	.98 (.11)	1.07 (.15)		
$\beta_{88,89}$	1.10 (.12)	.99 (.13)		
$\beta_{89,90}$	.94 (.08)	.94 (.08)		
$\beta_{90,91}$	1.02 (.10)	1.06 (.10)	.80 (.04)	.88 (.05)
$\beta_{91,92}$	.85 (.08)	.83 (.08)	.93 (.04)	.98 (.05)
$\beta_{92,93}$	.91 (.10)	.90 (.10)	.84 (.03)	.85 (.04)
$\beta_{93,94}$	1.11 (.09)	1.10 (.09)	1.04 (.04)	1.07 (.04)
$\beta_{94,95}$	1.03 (.07)	1.02 (.07)	.94 (.03)	.94 (.03)
$\beta_{95,96}$	.95 (.07)	.96 (.07)	.98 (.03)	.95 (.03)
$\beta_{96,97}$	.99 (.08)	1.01 (.09)	.98 (.03)	1.00 (.03)
$\beta_{97,98}$	1.02 (.08)	1.03 (.08)	1.01 (.03)	1.02 (.03)
$\beta_{98,99}$	.88 (.08)	.86 (.08)	.98 (.03)	1.00 (.03)
$\beta_{99,00}$	.97 (.11)	1.00 (.11)	.95 (.03)	.95 (.03)
$\beta_{00,01}$	1.16 (.07)	1.15 (.07)	1.02 (.03)	1.02 (.03)
$\beta_{01,02}$	.82 (.07)	.80 (.07)	.99 (.03)	.98 (.03)
$\beta_{02,03}$	1.04 (.10)	1.05 (.10)	.99 (.02)	.99 (.03)
$\beta_{03,04}$	1.04 (.09)	1.04 (.09)	1.01 (.03)	1.01 (.03)
$\beta_{04,05}$	.96 (.07)	1.00 (.08)	1.01 (.03)	1.01 (.03)
$\beta_{05,06}$	.97 (.08)	.97 (.07)	.90 (.03)	.90 (.03)
$\beta_{06,07}$	1.00 (.07)	.99 (.07)	1.00 (.03)	1.00 (.03)
var	$\varepsilon$ : 231 (17)	$\varepsilon_{1-2}$ : 244 (58) $\varepsilon_3$ : 164 (38) $\varepsilon_{4-12}$ : 251 (21) $\varepsilon_{13}$ : 190 (22) $\varepsilon_{14}$ : 240 (47) $\varepsilon_{15-16}$ : 186 (22) $\varepsilon_{17-19}$ : 258 (37) $\varepsilon_{20-22}$ : 200 (28)	$\varepsilon$ : 178 (7)	$\varepsilon_{1-2}$ : 246 (27) $\varepsilon_3$ : 193 (17) $\varepsilon_4$ : 214 (16) $\varepsilon_{5-6}$ : 175 (9) $\varepsilon_{7-9}$ : 207 (18) $\varepsilon_{10-19}$ : 169 (8)
covar		$\varepsilon_{5,6}$ : -51 (32) $\varepsilon_{9,10}$ : 43 (26) $\varepsilon_{10,11}$ : 28 (24) $\varepsilon_{11,12}$ : -41 (25) $\varepsilon_{18,19}$ : 38 (34)		$\varepsilon_{2,3}$ : 21 (18) $\varepsilon_{6,7}$ : 30 (13) $\varepsilon_{7,8}$ : 16 (13) $\varepsilon_{8,9}$ : 15 (11) $\varepsilon_{9,10}$ : 15 (11) $\varepsilon_{12,13}$ : 14 (10)
Corr. $\chi^2$	234.2	214.6	134.0	100.7
df	209	197	135	124
p-value	.11	.19	.51	.94
CFI	.99	.99	1.00	1.00
RMSEA	.020	.017	.000	.000
[90% c. i.]	[.000; .032]	[.000; .030]	[.000; .013]	[.000; .003]
N	317	317	1418	1418

Note: Estimates use post-stratification weights. Models are estimated by robust maximum likelihood. Satorra-Bentler scaled  $\chi^2$  and robust standard errors are reported.

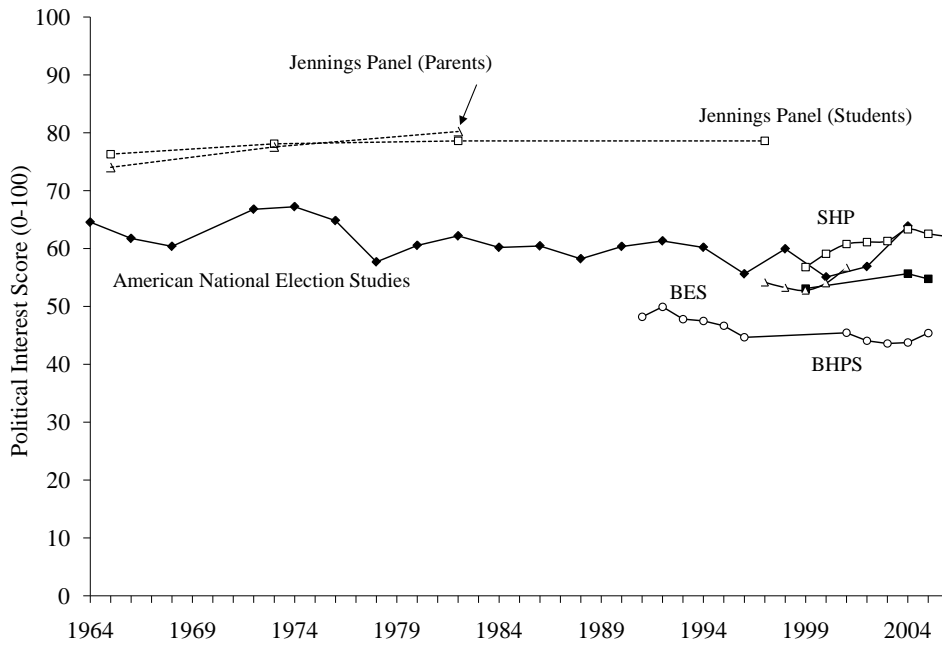
Table 4. Dynamic Panel Analysis of Political Interest (Arellano-Bond GMM Estimator)

	$\gamma$	Autocorrelation Test			$\gamma$	Autocorrelation Test		
		1st-Order	2nd-Order	Hansen Test		1st-Order	2nd-Order	Hansen Test
	<i>All lagged values as instruments</i>				<i>Maximum of three lagged values as instruments</i>			
<b>BHPS</b> (N=8,172 / 43,675)	.013 (.011)	-40.2 (.000)	-.2 (.84)	23.3 (.61)	.024 (.013)	-37.1 (.000)	.5 (.62)	3.7 (.82)
<b>SHP</b> (N=5,455 / 21,699)	.024 (.019)	-26.3 (.000)	.3 (.74)	12.0 (.60)	.025 (.021)	-24.0 (.000)	.4 (.69)	9.6 (.30)
<b>SOEP</b>								
Sample A (N=6,486 / 82,827)	.034 (.007)	-50.6 (.000)	2.6 (.01)	233.4 (.12)	.010 (.009)	-45.6 (.000)	.3 (.74)	41.4 (.33)
Sample E (N=1,337 / 8,068)	.059 (.023)	-19.4 (.000)	1.9 (.06)	27.2 (.45)	.034 (.028)	-16.3 (.000)	1.3 (.18)	10.4 (.59)
Sample F (N=7,143 / 34,566)	.022 (.012)	-38.7 (.000)	.2 (.87)	19.8 (.14)	.011 (.015)	-33.1 (.000)	-.6 (.56)	8.2 (.42)
Sample B (N=1,657 / 16,610)	.038 (.014)	-23.8 (.000)	-1.4 (.18)	189.1 (.83)	.041 (.019)	-21.4 (.000)	-1.5 (.13)	29.5 (.84)
Sample C (N=3,668 / 39,988)	.048 (.010)	-38.0 (.000)	.01 (.95)	164.0 (.00)	.032 (.013)	-34.0 (.000)	-1.1 (.27)	33.3 (.24)
	<i>Age under 22 in first wave</i>							
<b>BHPS</b> (N=949 / 4,809)					.037 (.042)	-12.0 (.000)	1.0 (.32)	5.5 (.60)
<b>SHP</b> (N=662 / 2,126)					.058 (.068)	-6.0 (.000)	-.5 (.61)	5.0 (.76)
<b>SOEP</b>								
Sample A (N=707 / 9,079)					.016 (.025)	-14.9 (.000)	-.9 (.74)	41.8 (.31)
Sample F (N=489 / 2,054)					.062 (.067)	-7.0 (.000)	-.9 (.35)	15.3 (.05)
Sample C (N=320 / 3,156)					.021 (.043)	-10.0 (.000)	-1.2 (.21)	35.8 (.15)

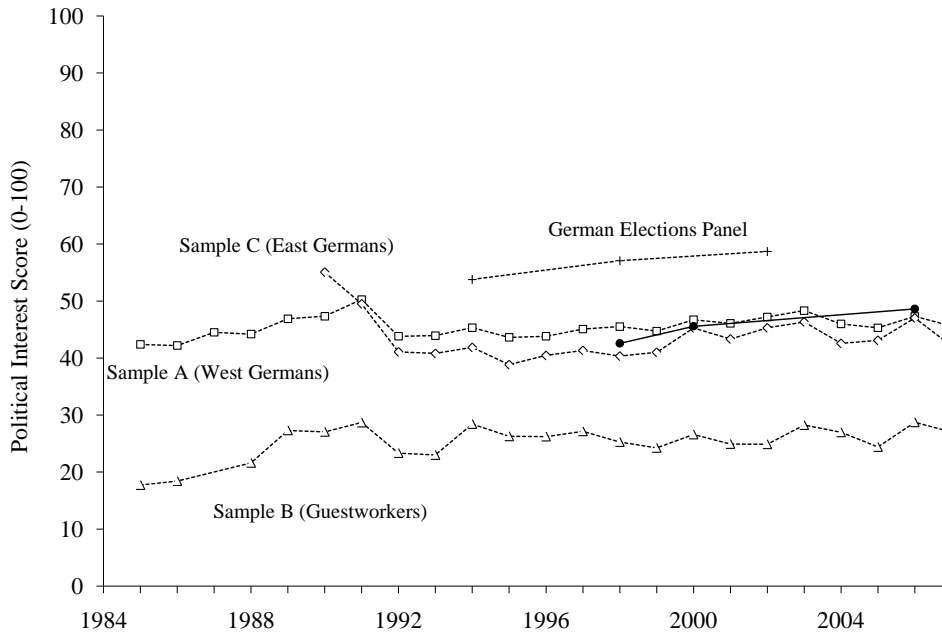
*Note:* Coefficients  $\gamma$  are one-step Arellano-Bond (1991) first difference GMM estimator with robust standard errors. Year dummies are included in all models. Models are estimated in *Stata 10.1* using the add-on *xtabond2* (Roodman 2009). The N's give the number of panelists and the number of political interest observations. Values in parentheses for the autocorrelation and Hansen tests are  $p$  values.

Figure 1. Political Interest in Britain, Germany, Switzerland, and the United States

(a) UK, Switzerland, United States



(b) Germany



*Note:* Solid lines and symbols indicate fresh cross-sectional estimates. Broken lines and unfilled symbols show estimates for panelists who answered the political interest question in all possible waves. Citizens only except in the Jennings data. Cross-sectional estimates are weighted. Estimates for the American National Election Studies were correct by Danielle Shani (2009) for differences in question placement. Panel estimates are weighted by longitudinal weights except for the Jennings data.

Figure 2. Stability of Observed Political Interest

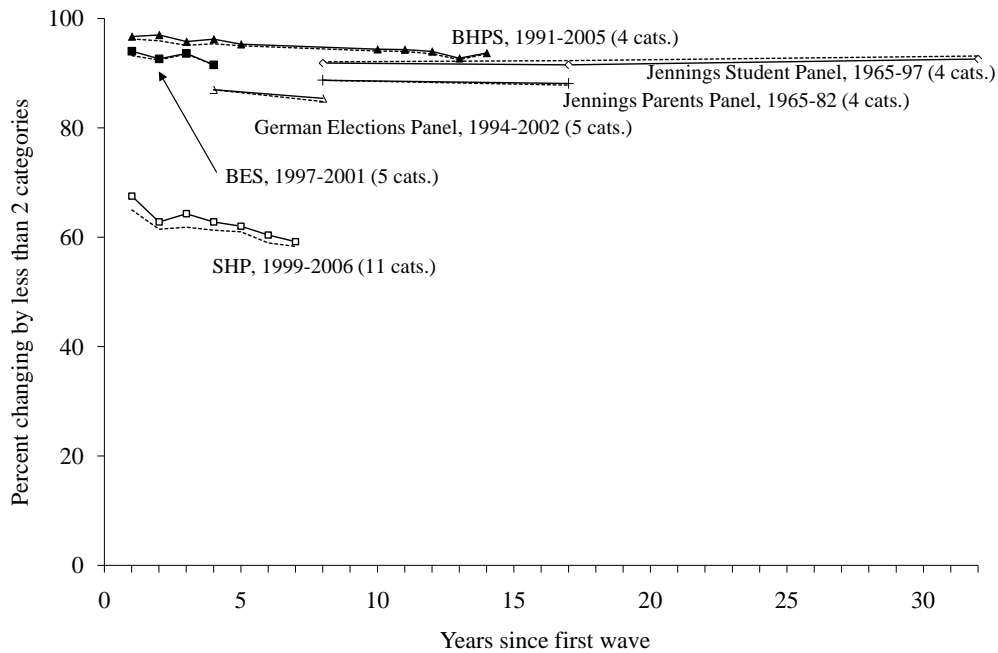
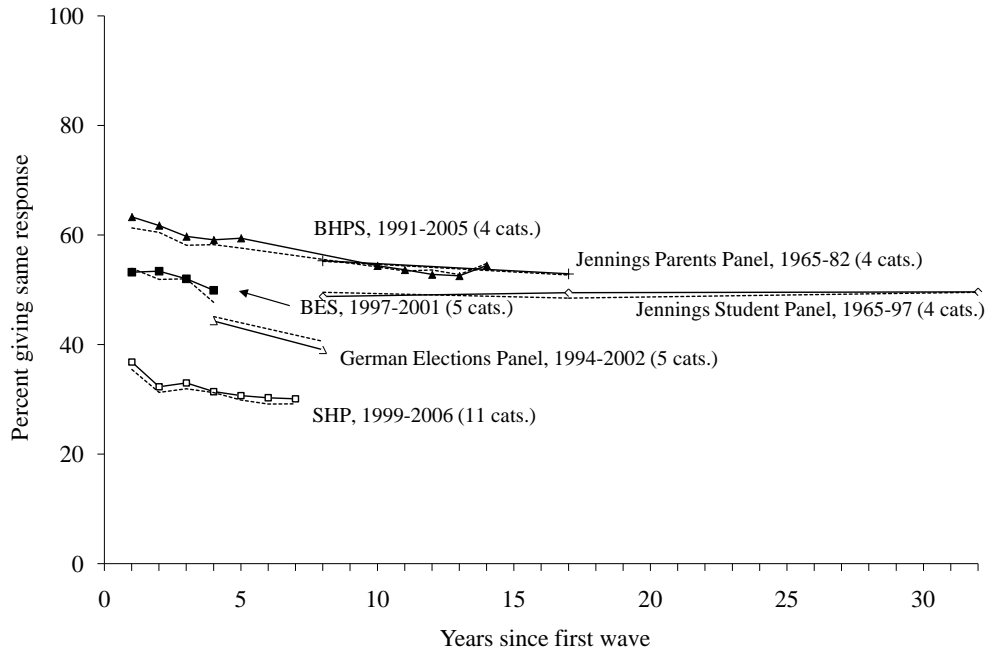
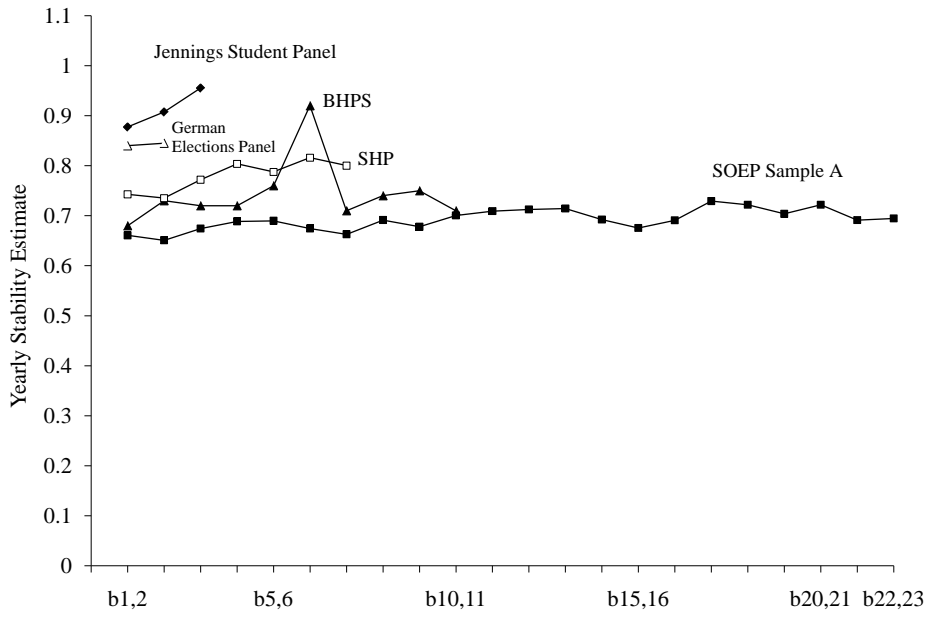
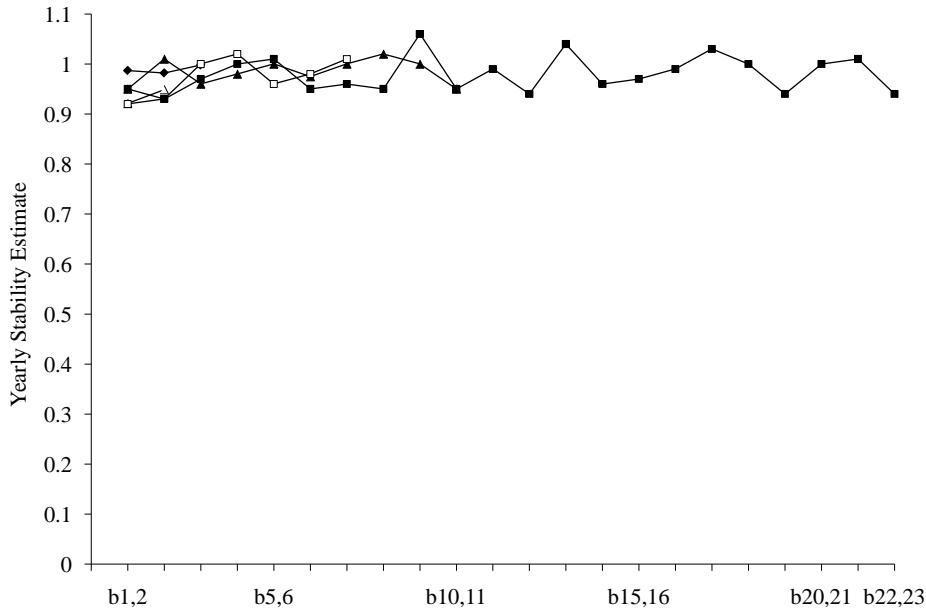


Figure 3. Stability of Political Interest

(a) OLS models



(b) Measurement Error Models



Note: The graphs plot unstandardized stability coefficients. For consecutive panels waves conducted more and less than a year apart, coefficients are transformed to yearly stability estimates. Citizens only.

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## Endnotes

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<sup>1</sup> I use the SOEP Scientific Use File from which 5 percent of households have been randomly removed. Except in this paragraph, household N's refer to the 95%-sample. SOEP were extracted using the Stata add-on package PanelWhiz v2.0 (Haisken-DeNew and Hahn 2006).

<sup>2</sup> The 1987 wave of Sample B is excluded because the political interest question was omitted in the translated versions of the questionnaire in 1987 used for most immigrant respondents.

<sup>3</sup> More extensive examinations do not reveal panel effects and indicate that a focus on cases with complete panel participation does not significantly bias estimates of stability in the general population. Results are available as an appendix at [www.princeton.edu/~mprior](http://www.princeton.edu/~mprior).

<sup>4</sup> “True” in this context means that it is the expected value of a (hypothetical) set of infinite replications of the measurement for a particular individual.

<sup>5</sup> According to Bentler (2006, 144-147), it could be more effective to analyze ordinal variables with more than 2 or 3 categories and similar distances between categories on the underlying variable as continuous variables. An alternative is to analyze the polychoric correlation matrix instead of the covariance matrix, but is not clear that this approach is more robust to violations of normality of the underlying distribution than the continuous-variable approach. A practical problem with the polychoric correlation approach is that some of the cells in the crosstabs of political interest across consecutive waves have very few observations (e.g., maximum political interest in wave t-1 and minimum interest in wave t), which leads to estimation difficulties.

<sup>6</sup> The models reported in Tables 1 – 3 allow only errors in adjacent waves to be correlated. I also examined error correlations with higher lags. In several datasets, additional significant correlations are identified. But allowing these correlations to differ from zero did not change the stability coefficients by more than .02, and changes were not in a consistent direction.

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<sup>7</sup> BHPS:  $\Delta\chi^2 = 26.7$  [8],  $p < .001$ ; SHP:  $\Delta\chi^2 = 19.7$  [5],  $p = .001$ ; BES:  $\Delta\chi^2 = 4.3$  [2],  $p = .12$ ; SOEP, Sample A:  $\Delta\chi^2 = 38.5$  [13],  $p < .001$ ; SOEP, Sample B:  $\Delta\chi^2 = 16.9$  [12],  $p = .15$ ; SOEP, Sample C:  $\Delta\chi^2 = 29.1$  [11],  $p = .002$ ; SOEP, Sample E:  $\Delta\chi^2 = 6.3$  [4],  $p = .18$ ; SOEP, Sample F:  $\Delta\chi^2 = 11.1$  [3],  $p = .01$ . Difference-in- $\chi^2$  tests are adjusted for robust estimation according to Bentler (2006, 158).

<sup>8</sup> Instead of relaxing only some uncorrelated error restrictions (based on significant LM tests), a Wiley-Wiley model with correlated errors can be estimated that treats measurement errors as latent variables that affect error in the following panel wave in a AR(1) process just like “true” political interest (Palmquist and Green 1992; Wiley and Wiley 1974). For comparison, I estimated this model for the BHPS. Assuming that the stability effects of true scores and measurement errors are constant over the entire panel (and that error variances are constant), the model generates a significant but small stability coefficient between measurement errors of .035 (with a robust standard error of .012). The average yearly stability in political interest is now .983, almost exactly the same as in the same model with uncorrelated errors (.981).

<sup>9</sup> Though point estimates of some stability coefficients exceed 1.0, their confidence intervals overlap 1.0 in all cases, so they are statistically indistinguishable from one. The interpretation that panelists become more extreme in their political interest in some years is thus not supported.

<sup>10</sup> For example, Wave 7 of the BHPS followed 5 years after Wave 6 because political interest was not measured between 1997 and 2000. The stability coefficient of .88 between the waves in 1996 and 2001 implies a yearly stability estimate of  $.88^{1/5} = .975$ .

<sup>11</sup> Measurement error models also generate estimates of the reliabilities of the political interest questions (the ratio of the true score variance to the total variance in the observed indicators). The 11-category measure in the SHP had the highest reliability with values between .77 and .84,

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suggesting the usefulness of a response scale with more categories. The questions in the BHPS, BES, and SOEP samples A, C, and F had reliabilities between .68 and .76. For unknown reasons, the same SOEP interest question produced lower reliabilities in sample E (between .58 and .68). Even though it used 5 response categories, the German Elections Panel had below-average reliability (between .63 and .68). Interviews with guestworkers in SOEP sample B were conducted in several different languages, which could explain the lower reliabilities (between .51 and .73). The reliabilities in the Jennings data were even lower (.60, .50, .49 in the parental data, .41, .50, .49, and .43 in the student data). More research is needed to determine if these low reliabilities are unique to the particular dataset or common for the ANES question format.

<sup>12</sup> The standard deviation of  $\varepsilon_{i,t}$  is about 25 in all datasets. Results of the earlier Wiley-Wiley analysis suggest that  $\varepsilon_{i,t}$  contains a lot of random measurement error.

<sup>13</sup> The BHPS sample is large enough to use the same age cutoff as in the dynamic panel analysis. Among respondents under 22, the average stability coefficient is .964, .009 lower than for those under 30. The conclusion that young and old people's interest exhibits similar stability remains the same without corrections for measurement error. For the BHPS, regressing political interest in Wave  $t$  on political interest in Wave  $t-1$  yields only one significant age difference (2003-4), and that one shows higher stability among the young.

<sup>14</sup> To be sure, an average yearly stability of .978 is not perfect stability. Over decades even small yearly deviations from perfect stability compound to produce some change. Annual stability of .978 implies a stability of .8 over ten years and .57 over twenty-five years.