

Institutional Context, Cognitive Resources and Party Attachments Across Democracies

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This paper develops and tests arguments about how national-level social and institutional factors shape the propensity of individuals to form attachments to political parties. Our tests employ a two-step estimation procedure that has attractive properties when there is a binary dependent variable in the first stage and when the number of second-level units is relatively small. We find that voters are most likely to form party attachments when group identities are salient and complimentary. We also find that institutions that assist voters in retrospectively evaluating parties—specifically, strong party discipline and few parties in government—increase partisanship. These institutions matter most for those individuals with the fewest cognitive resources, measured here by education.

1 Introduction

Since publication of *The American Voter* in 1960 (Campbell et al.), the study of party identification has held a central place in research on voting behavior and elections in American politics. In addition to remaining the strongest predictor of vote choice over the past half century (Campbell et al. 1960; Erikson et al. 2002; Green et al. 2002), party identification has repeatedly been shown to shape voters' assessments of campaigns, issues, and election outcomes. Recent studies also demonstrate that partisanship influences evaluations of the economy (Bartels 2002; DeBoef and Kellstedt 2004), as well as policy and ideological stances (Green et al. 2002). Partisans seem to engage their civic responsibilities more competently and more enthusiastically than nonpartisans, or "independents," whether measured by individuals' information, sophistication, or participation levels (Green et al. 2002).

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The success of its use in explaining American political behavior has inspired research on party identification outside of the United States. Like much work in American politics, comparative research often examines how partisanship shapes individuals' behavior, such as their propensity to vote and vote choice (e.g., Butler and Stokes's classic 1963 study). Other research investigates when and how individuals acquire and maintain party attachments. With several exceptions (noted below), this research focuses on factors that are specific to individuals. Dalton (2002), for example, finds a positive relationship between age and partisanship in Britain and France, and Jennings (1979) demonstrates that early life experiences shape party attachments in Britain and Germany. Recent work extends the study of partisanship to developing democracies, such as Brader and Tucker's (2002, 2003) research on political experience and the emergence of partisanship in Russia (see also Miller and Klobucar 2000). These studies on the acquisition of party attachments in new democracies are particularly important given the prevalence of arguments that mass partisanship enhances prospects of democratic consolidation (e.g., Converse and Dupeux 1962; Almond and Verba 1963; Converse 1969; Mainwaring 1999).

Like much previous research, this article develops and tests arguments about the propensity of individuals to form attachments to political parties. Our analysis, however, departs in two significant respects from most existing studies. First, we do not focus on understanding *to which* party a voter forms attachments. This has been a particular focus in research on American politics, in which scholars often strive to understand attachments to Democrats versus Republicans. Instead, our objective is to understand the circumstances under which individuals form attachments *to any party*, as opposed to no party at all.

Second, unlike most comparative research on the acquisition of party attachments, we do not focus on the direct effect of individual characteristics. Instead, we seek to explain how the political context in which individuals find themselves influences their propensity to form attachments. Do some political systems encourage the formation of party attachments more than others? Are social structures or governmental institutions most important? Are the effects of political context the same for all individuals? These are the questions that motivate our study.

We make two central arguments. First, a country's social and institutional context should have a systematic impact on party attachments. Most important, we find that institutions that encourage retrospective clarity of responsibility also encourage individuals to form party attachments. Additionally, elements of the social context that enhance the importance of group identities also encourage the formation of party attachments. Second, we argue that the impact of the social and institutional context does not operate the same on all types of individuals. Instead, context has the greatest impact on individuals who have the fewest cognitive resources (which we measure using education) to make systematic judgments about party choice.

The article is organized as follows. In the next section, we describe how we measure "party attachments" across 25 countries included in the Comparative Study of Electoral Systems (CSES) surveys. In so doing, we argue that this measure has much in common with traditional measures of party identification used in the American politics literature. We then develop theoretical arguments about how the social and institutional context influences the formation of party attachments, drawing in particular on insights from literatures on party identification and retrospective voting. Finally, we estimate several empirical models to test these arguments. We argue in particular for adopting a specific two-step estimation procedure that has attractive properties when there is a binary dependent variable in the first stage, and when the number of second-level units – countries in our case – is relatively small.

2 Measuring Party Attachments in Twenty-Five Democracies

We examine party attachments in countries that are solidly democratic. We therefore include only countries that score a 9 or 10 on the Democracy index (scaled 0–10) from Polity IV for at least the two years immediately prior to the year of the first module of that country's CSES election survey (1996–2001). A review of the descriptions of elections in these countries also led us to eliminate Thailand, which conducted its election survey following the corruption-plagued 2001 election. Our analysis therefore focuses on the 25 countries listed in Table 1. Although there is varying democratic experience within this set of countries, we are confident that they all qualified as established democracies at the time of the CSES survey.

Our measure of party attachments is based on responses to two questions from the CSES. The survey asked respondents in each country, “Do you usually think of yourself as close to any particular political party?” If a respondent replied “yes,” he or she was asked the follow-up question, “What party is that?” In this article, individual respondents are said to hold a “party attachment” if they answer “yes” to the first question and can then name a valid party. All other respondents are coded as independents. As Table 1 shows, there is considerable cross-national variation in the proportion of respondents who express party attachments, ranging from a low of 19% in Slovenia to a high of 85% in

Table 1 Party attachments and contextual variables in 25 countries

Country	<i>Proportion with party attachments</i>	<i>Social heterogeneity</i>	<i>Number of electoral parties</i>	<i>Effective number of legislative parties</i>		<i>Vote for candidate</i>	<i>Candidate control of ballot</i>	<i>Logged weighted party age</i>
Belgium	0.85	0.77	11	9.1	0	0.83		3.49
Australia	0.81	0.91	6	2.6	1	1		4.23
Israel	0.62	0.69	11	5.61	0	0		3.01
United States	0.54	1.31	2	2.01	2	1		4.96
Norway	0.52	0.26	7	4.36	0	1		3.85
New Zealand	0.51	1.21	6	3.76	0.5	0.54		3.88
Canada	0.49	0.32	10	4.66	0	1		4.4
Denmark	0.49	1.41	5	2.98	2	1		3.85
Poland	0.48	0.51	8	2.24	2	1		1.26
Iceland	0.48	0.27	5	3.45	0	0		3.79
France	0.48	0.29	6	2.95	1	1		2.88
Portugal	0.47	0.19	5	2.58	0	0		3.23
Sweden	0.46	0.82	4	2.12	2	1		4.33
Britain	0.46	0.29	7	4.29	0	1		4.67
Czech Republic	0.44	0.98	6	4.15	0	1		1.39
Bulgaria	0.42	1	5	2.92	0	0		1.7
Spain	0.41	0.87	5	3.14	0.01	0.5		2.94
Japan	0.37	0.55	6	2.94	1.2	1		3.16
Switzerland	0.36	1.14	10	5.95	1.02	1		4.36
Germany	0.36	0.83	5	3.3	1	0.5		3.89
Hungary	0.35	0.68	7	3.45	0.91	0.46		2.29
Lithuania	0.31	0.74	5	3.27	1.01	0.5		1.89
Netherlands	0.28	0.83	9	4.79	1	0		3.64
Ireland	0.26	0.28	6	3.34	1	1		4.25
Slovenia	0.19	0.51	6	4.38	0.04	1		1.77

Belgium. This article examines how the social and institutional context in these countries explains this variation.

Before turning to this task, it is useful to note that this measure of party attachment differs from the seven-point scale of party identification frequently used in American politics based on questions from the National Election Study (NES). The NES scale taps into both strength of attachment (strong identifier, weak identifier, or independent) and object of attachment (Democrat or Republican). Since the ends of the scale are anchored by the two main parties in the United States, it is difficult to implement the same measure in contexts in which there are more than two competitive political parties, competing in more than one policy dimension. The CSES binary measure of party attachment and the four-point scale (measured from strong attachment to either party to no attachment) are correlated at a level of 0.47. Note that the CSES measure poses a higher threshold for respondents by asking them to recall, as opposed to recognize, their preferred party. Accordingly, we find that significantly more NES partisans are classified as CSES Independents than are CSES partisans classified as NES Independents.

Party attachments and party identification have clear differences, although they are undoubtedly related. Therefore, it seems reasonable to ask how arguments about party identification might help us to understand cross-national differences in party attachments but to limit our interpretations to party attachments as defined by the question in the CSES.

3 The Impact of Social and Political Context on the Formation of Party Attachments

Past research suggests that country-level factors such as democratic experience, the party system, strategic voting incentives, and the nature of social groups may influence the development and consequences of party identification (Campbell et al. 1960; Crewe 1976; Miller 1976; Bowler et al. 1994; Niemi and Weisburg 2001; Green et al. 2002). However, although many researchers argue that it is important to examine party attachments cross nationally, there are few explicit theoretical arguments about precisely how context shapes the acquisition of party attachments, and no research, to our knowledge, examines how such arguments might apply to different types of individuals. The CSES is the first survey to ask these questions in such a wide range of democracies.

In this section, we draw on existing research about the acquisition of party identification at the individual level to develop arguments about how social and political context should influence the incidence of party attachments across the countries. We also argue that the impact of institutional context will vary with individuals' level of cognitive resources.

3.1 *Party Attachments as Psychological Attachments Rooted in Socialization Processes*

In many respects, existing research concerning the individual bases of party identification divides into two perspectives, both of which stem from studies in American politics. One perspective, which emerged from *The American Voter*, views party identification as an individual's "psychological attachment" to a political party, typically rooted in early adult socialization processes (Campbell et al. 1960). The other perspective views party attachments as rules of thumb that develop based on "running tallies" about which parties best serve an individual's interests (Fiorina 1981; Achen 2002).

First consider the *psychological attachment* perspective. A central argument in the literature is that individuals are most likely to be partisans if their parents are partisans and

will become partisans of their parents' parties. The parental socialization process itself should not vary across countries; a family in one country should be about as likely to socialize their children politically as a family in another country. However, because this process is cumulative, with each generation being influenced by the party identification of the previous one (Crewe 1976), we should expect party attachments to be greater in countries where more generations have experience with the party system, or as the average age of the currently competitive parties increases (Converse and Pierce 1992; Green et al. 2002).

A second argument focuses on group socialization. Membership in ethnic, linguistic, religious, and other social groups that have clear linkages to specific parties also encourages partisan attachment (Campbell et al. 1960). Party attachments should therefore be highest in ethnically or religiously heterogeneous societies, where the salience of groups should be high, increasing the incidence of party attachments.

A third argument focuses on cross pressures by different groups. If membership in one group, such as a union, encourages partisanship for one party, and membership in another group, such as a church, encourages partisanship for another party, then these cross pressures should diminish the formation of party attachments (Lipset and Rokkan 1967). Cross pressures will be low when different social groups reinforce each others' partisan identities, such as if a religious cleavage divides people along the same line as a class or linguistic cleavage. Cross pressures will also be low if there is a sufficient number of electoral parties. A good example is Belgium, where individuals could be cross pressured by a number of group memberships, the most salient of which are likely language and religion. These cross pressures are mitigated by the highly proportional Belgian party system, which allows parties to form that appeal to specific cross sections of groups. For example, because there is both a Flemish and French Christian Democratic party it is unnecessary for Catholic voters to choose between a "religious" party and a "language" party. In general, as the party system offers more electoral choices to voters, cross pressures should be relieved, making individuals more likely to be partisans.

3.2 *Party Attachments as Running Tallies of Retrospective Evaluations*

The second perspective prevalent in the literature views party identification as the result of a "running tally" of voters' retrospective assessments of party behavior in office (Fiorina 1981; Shively 1979). Voters rate parties on their performance in office and develop party attachments if their cumulative rating for a particular party becomes sufficiently high (Fiorina 1981). In turn, party labels act as informational shortcuts that allow voters to choose the party that best serves their interests.

With respect to understanding cross-national variation in the incidence of party attachments, the running tally framework directs our attention to political factors that shape the ability of voters to make retrospective judgments. One factor is the age of the party system. If parties are relatively young, it will obviously be difficult for a voter to retrospectively gauge which party best serves his or her interest. Thus, like the psychological attachment literature, the running tally approach should lead us to expect more party attachment in systems where the parties are long established.

Voters should also be most likely to develop informational shortcuts when the political system creates clear responsibility for policy outcomes. The clarity of responsibility for policy outcomes should depend on a number of institutional factors. One such factor is legislative party system fractionalization (Powell 2000; see also Powell and Whitten 1993). As the number of parties in the legislature increases, the consequent power sharing

in government impedes an individual's ability to make retrospective judgments, and thus to develop a clear "running tally" that leads to party attachments.

A second factor is the nature of parties themselves. Some parties are highly disciplined, giving relatively little autonomy to their members in the legislature or in the campaign and offering few opportunities for candidates to cultivate a "personal vote." Other parties are much less disciplined and allow candidates a significant opportunity to develop a personal basis of support. As parties become less disciplined, and thus as representatives within the same party adopt divergent positions and pursue various goals, it should become more difficult for voters to make retrospective judgments about parties' performances. Thus, from the running tally perspective, party attachments should be greatest in countries where parties are most disciplined.

3.3 *How Cognitive Resources Mediate the Impact of Political Context on Party Attachments*

We have argued that both the psychological attachment and running tally perspectives have implications for how the political context should influence the propensity of individuals to develop party attachments. But will social and institutional context operate equally on all types of individuals? We believe not.

Features of the political environment that influence the formation of party attachments should have the most significant impact on individuals with the *fewest* cognitive resources; that is, the fewest resources to interpret political information. Our argument stems from an "integrated" approach to the study of party attachments, one that views both psychological attachments and rational updating as factors that influence the formation of partisanship. This perspective is developed most clearly by Achen (1992). In his model, baseline levels of party attachments are due in large part to early adult socialization processes. Over time, political experience leads individuals to update their beliefs about party differentials, which may or may not cause them to gain, lose, or change party identification.

The role of "noise" in the informational environment is central to the integrated approach and to our application of it in this study. In Achen's model, voters receive more or less noisy signals about which party best serves their interests. As noise increases, individuals become less certain of party differences, making it more difficult for them to form party attachments.

Though Achen does not focus on the origin of these signals, one could think of noise as having either an individual- or a system-level source. Some individuals are simply better than others at interpreting their political environment, i.e., they have a lower level of noise. If noise is related to an individual's cognitive resources, one implication of this integrated perspective is that party attachments should be less likely among individuals with fewer cognitive resources.

The extent to which low cognitive resources inhibit the formation of party attachments should also depend on the degree to which the political system sends noisy signals about the actions or positions of the parties. If social and institutional context make it relatively easy to form initial beliefs and to update party differentials, an individual's cognitive resources should have less of an impact on their propensity to form party attachments. In systems where socialization processes play a relatively small role in party attachments (such as homogenous societies, or heterogeneous ones with substantial cross pressures), individuals have noisy initial beliefs about which party is best. Likewise, in countries where institutional clarity of responsibility is low (such as when there are multiple

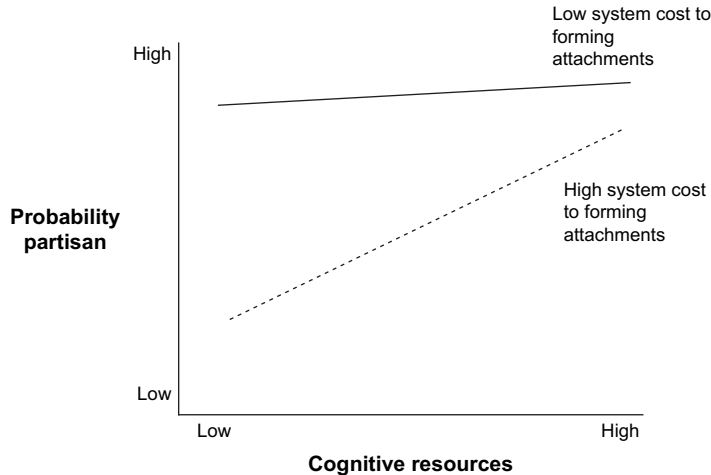


Fig. 1 Party attachments and cognitive resources in different institutional environments.

candidate-centered parties in the legislature), individuals receive noisy signals about party behavior. In these cases, individuals with low cognitive abilities will have the most difficulty forming attachments. By contrast, if socialization and running tally processes work well, individuals with low cognitive resources should find it easier to create party attachments because initial and updated beliefs about parties are less noisy.

This last claim is related to one made by Shively (1979), who argues that party identification serves as a functional *substitute* for rational updating by individuals with low levels of resources. But there is an important difference. From the integrated perspective, party identification depends on both socialization and rational updating. Thus party attachments will increase with cognitive resources, though the rate at which they do so should depend not only on the level of cognitive resources but also on the degree to which initial socialization processes provide strong prior beliefs about which party is best. By contrast, in Shively's article, party identification is a *substitute* for cognitive reasoning. The propensity to form such attachments is higher for an individual with lower cognitive resources. In the tests below, we can examine whether the data are more consistent with the integrated or the substitution arguments.

Figure 1 depicts these implications of the integrated perspective. The figure indicates the relationship between cognitive resources (horizontal axis) and the probability of a citizen having a party attachment (vertical axis) in two different political environments. One political environment (the solid line) makes it relatively easy (according to our arguments in the previous section) to form and update party attachments (e.g., a large number of electoral parties, or disciplined parties). The second social or institutional context (the dashed line) makes formation of such attachments relatively difficult. For the easy environment, we see a small impact of cognitive abilities on party attachments. Even individuals with limited resources can differentiate among parties, and thus have relatively high levels of party attachments. In the more difficult environment (dashed line), cognitive abilities have a substantial impact. An individual with high cognitive abilities is able to "cope," for example, with a large number of parties—by reading, thinking, evaluating, and discussing with friends, he or she can develop reasonably precise estimates of which party is best. An individual with fewer resources is less able to use updating processes to make precise estimates in the more difficult informational environment, a problem that

would be particularly salient if socialization processes did not encourage partisanship. Thus, as indicated in Fig. 1, the percentage of low-ability individuals with party attachments should be much lower in systems that make it most difficult to interpret signals in the political environment. Note that if the “substitution perspective” were depicted in the figure, it would simply be a downward sloping line—more cognitive resources would lead to fewer party attachments, independent of the political system.

4 The Independent Variables

Values for the independent variables in each country can be found in Table 1. Recall that the psychological attachment perspective highlights variables measuring the salience of groups, group cross pressures, and the permissiveness of the electoral system. Because group linkages should be more prominent in heterogeneous societies, we measure group salience using the sum of ethnic and religious fractionalization indices described in Alesina et al. (2003). *Social heterogeneity* should have a positive effect if group differences lead to higher levels of party attachment.

Unfortunately, we cannot measure cross-cutting group membership. We can, however, measure the level of electoral choice. As discussed previously, narrow electorates composed of cross-pressured individuals will be less likely to feel close to a political party when there is an inadequate choice of parties competing for office. As the *number of electoral parties* increases, parties’ platforms will become more nuanced and cross-pressured individuals will be more likely to feel close to and develop attachments to parties. Our measure is the number of parties that receive more than 1% of the vote in the relevant legislative election, a standard adopted by Ordeshook and Shvetsova (1994). The 1% threshold is intentionally low; in some electoral systems 1% is more than enough to obtain parliamentary representation. We recognize, however, that not all parties exist to make serious appeals to voters. It is hard to argue, for example, that “Militant Elvis” and the “Independent Fancy Dress Party” are helping to alleviate cross pressures in Britain. We include the 1% threshold to remove such parties.¹

The running tally perspective focuses our attention on variables that shape clarity of responsibility. As the number of legislative parties increases, it will become more difficult for voters to assess responsibility for policy outcomes. We use Laakso and Taagepera’s (1979) *effective number of legislative parties* to measure fractionalization in the legislature. It is important to note that while the numbers of electoral and legislative parties are empirically related (with a correlation of .79), they measure different concepts and are used to test distinct arguments—one about choice alleviating cross pressures in the electorate and the other about retrospective evaluations. If either variable is omitted we should worry about the results being biased. As shown in Table 1, there are systems like the United States, with a low number of electoral and legislative parties and countries like Belgium, where there are a high number of both, but also countries like Canada, Israel, and Poland, where there is a significant disconnect between the two variables, with many more electoral than legislative parties. Also note that differences between the two variables are not strictly related to electoral laws. The numbers of electoral and legislative parties are roughly the same in the United States (plurality) and in Iceland and Slovenia (PR), but are quite different in Canada (plurality) and Israel (the most proportional system). Thus the

¹In a typical British election over 70 parties are on the ballot, but only seven to nine receive more than 1% of the total vote.

data will provide some leverage in answering which aspects of the party system impact party attachments.

Our second measure of retrospective clarity of responsibility is related to party cohesion. Carey (2004) demonstrates that party unity is highest in systems where institutional arrangements prohibit representatives in the same party from competing for votes. We draw on a dataset created by Wallack et al. (2003) that measures (in a somewhat amended fashion) several institutional variables originally described in Carey and Shugart (1995). *Vote for candidate* (Carey and Shugart's "pool" variable) captures the degree of interdependence between voting for a candidate and the candidate's party (ibid.). A country scores a zero for closed party list systems, a one for subparty pooling (i.e., transferable vote systems) and a two for voting without any pooling.² The variable should have a negative coefficient if institutions that decrease intraparty competition encourage party discipline and party attachments.

Candidate control of ballot (Carey and Shugart's "ballot" variable) captures candidates' control of two things: access to a party's label and manipulation of ballot rankings in party list systems. In our data, the variable ranges from zero to one, with zero representing the most party-oriented ballot (i.e., when party leaders control nominations and candidate order on the ballot) and one representing the most candidate-centered ballot (i.e., when voters can choose candidates in the order they prefer in an open list system). The variable should have a negative coefficient if party discipline facilitates party attachments.³

Finally, we measure the age of the party system as the logged and weighted (by vote proportion) age of (up to) the top six vote-receiving parties in the CSES election. In line with both the psychological attachment and running tally perspectives, *logged weighted party age* should have a positive effect if old party systems make it easier for individuals to develop partisan attachments.

For the individual-level variables, education ranges from one (low) to eight (high). Age is measured as the respondent's age in years divided by 10 (ranging from 1.5 to 10.1), and age squared is the respondent's age in years squared and divided by 100.

5 Estimating the Impact of Context Using Proportions of Partisans

We would like to estimate the effect of the country-level social and institutional context on cross-national differences in party attachments. The simplest approach involves regressing the countries' mean level of party attachments on the system-level variables and on the means of the individual-level variables, such as age and education. This method poses some drawbacks, which we discuss below, but it represents a sensible place to begin, in particular because this approach yields results that are very easy to interpret: the

²Carey and Shugart code single-member district systems as zeroes because in such systems "a candidate's fortunes depend on the ability of her entire party to attract votes. The party reputation, then, is at a premium relative to personal reputation" (p. 421). We think that this depends on other factors (notably, the degree to which there is party discipline in two-party systems). Thus we follow Wallack, Gaviria, and Panizza's departure, which codes single-member districts (SMDs) as having the most likely candidate-centered campaigns. In our data, this change affects Britain, Canada, and the United States. When these countries are coded according to Carey and Shugart's specification, the results are the same.

³Again, there is a difference in the coding of SMDs between the Wallack, Gavaria, and Panizza and the Carey and Shugart specifications. We follow Wallack, Gavaria and Panizza, who code countries with SMD as one (compared to Carey and Shugart's coding as zero). Note that we ignore a third Carey and Shugart variable: "vote." This reflects the extent to which voters can target their preferred candidate, but it is extremely highly correlated with the candidate control of ballot variable. A fourth variable measures district magnitude; we do not use this since we measure the number of parties directly.

coefficients describe how changes in the explanatory variables affect the percentage of individuals who have party attachments.

Results from linear regression models are given in Table 2.⁴ The coefficients denote the actual change in percentage partisan. Column 1 includes all 25 of the countries that qualify as sufficiently democratic. There is virtually no empirical support for any of the theoretical arguments, as none of the independent variables are even marginally significant, and the overall fit of the model is quite poor.

Standard diagnostic tests on the leverage of particular observations indicate that Belgium is exerting extraordinary influence on the regression results. If our argument is correct, this is not surprising, since Belgium has the highest level of party attachments and almost twice the effective number of legislative parties of any other country in the sample. Belgium's party system is unique in that all of the major party groups (Christian Democratic, Social Democratic, Liberal, and Greens) exist as separate parties for both language groups, which may create unusual links between citizens and parties on the extremely salient language issue. Additionally, the questions about party attachments were not asked in Walloon, the French-speaking region of Belgium. Below we examine results when Belgium is omitted from the sample.

In column 2 we present results from the model estimated in column 1 minus Belgium.⁵ Consistent with the socialization literature, the percent of individuals who feel close to a party increases with the number of electoral parties and with social heterogeneity. For example, an additional party in the electorate increases the percentage of individuals with partisanship by seven points. Consistent with the running tally hypotheses, party attachments decrease with the effective number of legislative parties and when elections are more candidate centered. A unit increase in the effective number of legislative parties is expected to decrease the share of people attached to a party by 21%. Moving from a system with closed lists to one with open lists will decrease partisanship 17.5%. We also find a significant positive effect of *logged weighted party age* but no effect of *candidate control of ballot*.

Although the results in column 2 support the social and institutional system-level arguments developed above, these regressions cannot tell us if the impact of context varies with cognitive resources.⁶ To examine the effect of cognitive resources, we differentiate among individuals with varying levels of education. We group the data into three subsamples: individuals who have not completed secondary education (46% of respondents), individuals who have completed secondary education and possibly trade school (34% of respondents) and those who have any level of college education (20% of the respondents). The results in columns 3–5 of Table 2 support the integrated approach. For the highly educated individuals, most of the macro variables have no effect on the proportion of individuals with party attachment. Only *social heterogeneity* and the *effective number of legislative parties* have precisely estimated coefficients in the correct direction. By contrast, at low and middle levels of education, all variables except *candidate control of ballot* are precisely estimated with signs in the correct direction. As we argued above, it seems that the system-level factors are more important for the least educated individuals.

⁴We present OLS results to make interpretation easier. Alternative methods such as grouped probit do not change the significance levels of the results shown.

⁵Alternatively, if we include a dummy variable for Belgium, its coefficient is 1.10, its standard error is 0.21, and the results for the other variables in column 2 are unaffected.

⁶We thank Chris Achen for suggesting this approach in the early version of this article.

Table 2 The impact of context on the proportion of respondents with party attachments

	(1)	(2)	(3)	(4)	(5)
	<i>With Belgium</i>	<i>Without Belgium</i>	<i>Low Education</i>	<i>Middle Education</i>	<i>High Education</i>
Mean education	0.069 (0.062)	0.006 (0.04)	−0.003 (0.041)	−0.023 (0.043)	−0.033 (0.058)
Mean age	0.007 (0.014)	−0.02 (0.01)**	−0.013 (0.01)	−0.02 (0.011)*	−0.027 (0.015)*
Social heterogeneity	0.055 (0.116)	0.233 (0.079)***	0.194 (0.081)**	0.241 (0.084)***	0.188 (0.114)*
Number of electoral parties	0.006 (0.027)	0.072 (0.021)***	0.085 (0.021)***	0.071 (0.022)***	0.047 (0.03)
Effective number of legislative parties	0.012 (0.045)	−0.207 (0.05)***	−0.227 (0.052)***	−0.194 (0.054)***	−0.143 (0.073)**
Vote for candidate	−0.051 (0.069)	−0.175 (0.049)***	−0.202 (0.05)***	−0.169 (0.052)***	−0.106 (0.07)
Candidate control of ballot	0.017 (0.094)	0.092 (0.059)	0.118 (0.061)*	0.092 (0.063)	0.085 (0.086)
Logged weighted party age	0.031 (0.033)	0.053 (0.021)**	0.061 (0.021)***	0.051 (0.022)**	0.045 (0.03)
Constant	−0.414 (0.769)	1.364 (0.583)**	1.083 (0.597)*	1.494 (0.622)**	1.864 (0.841)**
Observations	25	24	24	24	24
R-squared	0.255	0.616	0.644	0.537	0.315

Note. Standard errors in parentheses.

* $p < .10$; ** $p < .05$; *** $p < .01$.

We do not, however, wish to make too strong a case for all of the theoretical arguments based on the results shown in Table 2. The subsamples approach, while highly intuitive and easy to interpret, is unattractive in several respects. By focusing on aggregate averages, we lose information about the distribution of the individual-level variables that might influence party attachments within countries, making it impossible to control accurately for the effect of these individual-level attributes. Also, because part of the sample is discarded in each test, using subsamples is inefficient. Finally, although these results suggest that there are real differences across education levels, using subsamples does not allow us to directly estimate the interaction of education and political context. In the next section, we use a two-step modeling strategy to test this interaction. As a bonus, we will also be able to control for a somewhat broader set of individual-level characteristics.

6 Estimating Interactive Effects with a Two-Step Model

Our goal is to estimate individual-level effects, system-level effects, and their interaction, a task that raises a number of thorny methodological issues and that forces us to consider the trade-offs of alternative models. One approach that we should *not* adopt is a simple logit or probit model with both the individual- and system-level variables on the right-hand side. This approach underestimates the standard errors of the country-level variables because observations within countries are not independent.

We can, however, specify the model hierarchically. For each country $k \in \{C_1, C_2, \dots, C_K\}$ and individual $i \in k$ we have the following probit model:

$$P(y_i = 1 \mid educ_i, age_i, age_i^2, male_i) = \Phi(\beta_{const}^k + \beta_{educ}^k educ_i + \beta_{age}^k age_i + \beta_{age^2}^k age_i^2 + \beta_{male}^k male_i) \quad (1)$$

We have argued that the baseline level of party attachments (indicated by the constant β_{const}^k) and the effect of education on party attachments (indicated by β_{educ}^k) are functions of contextual level variables

$$\beta_{const}^k = \delta_{const} + \gamma_{const} z^k + \varepsilon_{const}^k \quad (2)$$

$$\beta_{educ}^k = \delta_{educ} + \gamma_{educ} z^k + \varepsilon_{educ}^k \quad (3)$$

where z^k is the vector of country-level variables for each country k . Since we want to estimate a fully interactive model, we also estimate the second-level equations for the other coefficients in the individual-level model. The full model we want to estimate is

$$P(y_i = 1 \mid educ_i, age_i, male_i, z^k) = \Phi \left[\begin{array}{l} \delta_{const} + \gamma_{const} z^k + \\ (\delta_{educ} + \gamma_{educ} z^k) educ_i + \\ (\delta_{age} + \gamma_{age} z^k) age_i + \\ (\delta_{age^2} + \gamma_{age^2} z^k) age_i^2 + \\ (\delta_{male} + \gamma_{male} z^k) male_i + \\ \varepsilon_{const}^k + \varepsilon_{educ}^k educ_i + \varepsilon_{age}^k age_i + \varepsilon_{age^2}^k age_i^2 + \varepsilon_{male}^k male_i \end{array} \right] \quad (4)$$

There are at least two canonical approaches in the econometric and statistics literatures to estimate this model. Random effects (or multilevel) models that allow for random intercepts and slopes attempt to model the variance structure specified above (Raudenbush and Bryk 2002). Other models attempt to make the estimation of the standard errors robust to arbitrary departures from homoskedasticity while taking clustering into account (such as the one implied in the model above) (Wooldridge 2003).

The two models assume that the country-level disturbances (specified above) and the individual-level disturbances (implied by the probit model) are independent. Both models are also derived under the assumption that the number of units (countries) tends to infinity, and there is concern that these models do not perform very well under the conditions of our study (25 countries). In particular, research in biostatistics indicates that clustered standard errors in probit models are too small when the number of units is less than or approximately 40 (Murray et al. 2004). And, although various forms of small sample corrections have been suggested in the literature (Fay and Graubard 2001; Murray et al. 2004), there is little consensus about which one to choose, and none is available in any of the widely available statistical packages.

Classical estimation of random effects models also underestimates standard errors when the number of units is small. Maas and Hox (2004) perform a simulation study and suggest that at least 50 units are necessary when substantive interest lies in the (second-level) contextual effects.

One alternative that avoids these problems is to adopt a Bayesian approach using Markov chain Monte Carlo methods (Gelman et al. 2004; Western 1998). Bayesian methods do not rely on asymptotic analyses and the numerical integration's accuracy is limited only by computer time. We do not follow this route, however, because setting up uninformative priors for random coefficient models and monitoring convergence is difficult and extremely time consuming with the currently available software and hardware.

Our approach is therefore to adopt a two-step estimation procedure. The first step involves running a separate probit model in each country that estimates the effects of individual-level attributes on the likelihood of being a partisan. We include the individual-level attribute of interest, education, as well as the other control variables that are possible to include in the 24 countries: age, age squared, and male.⁷ In other words, in each country we estimate the probit model in Eq. (1) by maximum likelihood.

Since the number of observations in each country is large, under standard assumptions, each of the β^k estimates is consistent and asymptotically normal. Each of the individual-level estimates can be seen as a reduced form parameter of a fully interactive model that allows us to estimate the impact of context on party attachments for a range of education levels while controlling for age and gender.

To test the socialization and institutional hypotheses, we can use linear regression in the second stage, albeit with a suitable weighting matrix (Wooldridge 2002). In particular, in the second-level regressions, we want to weight the coefficients from the first-level regressions by their precision.

We use the weighting scheme described by Borjas and Sueyoshi (1994). The weights in the second step regression take into account two components of the error term. The first

⁷Other individual-level variables of interest are not asked consistently across the countries in our sample. One exception is income, which might be included as a proxy for cognitive resources. Unfortunately, the only available cross-national income variable measures household income, which is not a good measure of an individual's cognitive resources. It is also missing data for many respondents.

component comes from the individual-level regressions, since each β^k is estimated with error. The second component is from the second-stage regressions, because the macro-level variables do not explain all of the variation across countries. Following Borjas and Sueyoshi, we weight the second-level regression by the matrix

$$\Omega = \mathbf{V}_{\beta^k} + \sigma_v^2 \mathbf{I}_K \quad (5)$$

where the matrix \mathbf{V}_{β^k} reflects errors associated with our estimate of β^k , and σ_v^2 is the residual variance from the second-stage model. It is straightforward to estimate the variance of the first-level errors—we can simply use the estimated variances of the country-specific coefficients.

Estimating the second-level residual variance σ_v^2 is more difficult, since the residuals in the second-stage regression (estimated without weights) include first- and second-level errors. An estimate of the residual variance in the second-stage regression is

$$\tilde{\sigma}^2 = \sum_{k \in \{C_1, C_2, \dots, C_K\}} \tilde{\omega}_k^2 / (K - M) \quad (6)$$

where the sum is taken over all countries k , M is the number of variables in the second stage plus the intercept,⁸ and $\tilde{\omega}_k$ are the estimated residuals in the second stage. By definition,

$$\tilde{\omega}_k^2 = (\hat{v}_k + \hat{\beta}^k - \beta^k)^2 = \hat{v}_k^2 + (\hat{\beta}^k - \beta^k)^2 + 2\hat{v}_k(\hat{\beta}^k - \beta^k) \quad (7)$$

implying

$$\tilde{\sigma}^2 = \frac{\sum_{k \in \{C_1, C_2, \dots, C_K\}} (\hat{v}_k^2 + (\hat{\beta}^k - \beta^k)^2 + 2\hat{v}_k(\hat{\beta}^k - \beta^k))}{(K - M)} \quad (8)$$

Borjas and Sueyoshi claim that $2\hat{v}_k(\hat{\beta}^k - \beta^k)$ is approximately zero by the independence assumption between the first- and second-level errors. Thus,

$$\tilde{\sigma}^2 \approx \frac{\sum_{k \in \{C_1, C_2, \dots, C_K\}} (\hat{v}_k^2 + (\hat{\beta}^k - \beta^k)^2)}{(K - M)} = \hat{\sigma}_v^2 + \frac{\sum_{k \in \{C_1, C_2, \dots, C_K\}} ((\hat{\beta}^k - \beta^k)^2)}{(K - M)} \quad (9)$$

and

$$\hat{\sigma}_v^2 = \tilde{\sigma}^2 - \frac{\sum_{k \in \{C_1, C_2, \dots, C_K\}} (\hat{\beta}^k - \beta^k)^2}{(K - M)} \quad (10)$$

Borjas and Sueyoshi further argue that $\sum_{k \in \{C_1, C_2, \dots, C_K\}} (s.e.(\hat{\beta}^k))^2$ is a good estimate of $\sum_{k \in \{C_1, C_2, \dots, C_K\}} (\hat{\beta}^k - \beta^k)^2$, yielding

$$\hat{\sigma}_v^2 = \tilde{\sigma}^2 - \frac{\sum_{k \in \{C_1, C_2, \dots, C_K\}} (s.e.(\hat{\beta}^k))^2}{(K - M)} \quad (11)$$

⁸That is, $K-M$ is the degrees of freedom left in the second stage.

The matrix of weights proposed by Borjas and Sueyoshi is therefore

$$\hat{\Omega} = \mathbf{V}_{\beta^k} + \hat{\sigma}_v^2 \mathbf{I}_K \quad (12)$$

Borjas and Sueyoshi provide evidence from Monte Carlo experiments that the weighting strategy has good small sample properties for this two-step estimator. Their experiments also show that random effects probit produces inferior results when the number of individuals per unit is large.

7 Results from the Two-Step Approach

We do not present the 24 country-level probit models of the effects of education and the other control variables here, although they are available on the *Political Analysis* Web site. These results show that the effect of education is positive in all but two countries, is precisely estimated in 19 of the 24 countries, and is never negative and statistically significant. Thus the first-level results provide no support for the “substitution” hypothesis, which argues that as education increases party attachments will become less likely. Since they are not the main interest of this article, we do not further discuss the individual-level estimates.

Table 3 presents the second-stage results. Because we are implicitly estimating an interactive model, the intercepts in each country (i.e., the constants from the level-one regressions) will vary according to the centering of the individual-level variables. The relevant baseline for Table 3 is a 40-year-old female with a high school education. That is, column 1 is based on a regression where age is rescaled to equal 0 for a 40-year-old (i.e., rescaled age/10 = (age – 40)/10), female is set equal to 0 (and male = 1), and education is rescaled to equal 0 for an individual with a high school education (i.e. rescaled education = education – 5).

The second-level results for the regression on the constants from the first-level regressions are not invariant to being rescaled. This is obvious from the results in Table 3. Note, for example, that the coefficients of the system-level variables in column 3 (the regression using the “male” coefficients from the level-one regressions) typically have the opposite sign of the coefficients in column 1 (the regression using the constants from the level-one regressions), although they are smaller in absolute value. Since the coefficients on male differ across countries, the results for the second-level regression on the constants from the first level would be different than those presented in Table 3 if a male (rather than a female) were the (zero-valued) baseline for gender. The direction of the system-level effects on the constant would be the same, but they would be slightly smaller in magnitude for males than for females.

Because the results from the first-stage regressions for the other independent variables are invariant to rescaling, so are the results for the fully interactive model. Thus the central problem that the scaling issue poses lies in presenting the substantive results of interests. These results depend on the values of the independent variables in the first stage (which is the point of estimating an interactive model in the first place). In interpreting the interactive results, we examine how the impact of institutional context varies with education by discussing the effects for a 40-year-old female, our baseline category in Table 3.

We argue that the effects of social and institutional context should diminish as education levels increase. The results in Table 3 support this argument; the coefficients for the system-level variables in column 1 have the opposite sign of those in column 2, where the regression shown in column 2 uses the education coefficient from level one as the dependent variable. An increase in the effective number of legislative parties, for example, decreases the

Table 3 Second-stage estimates of the impact of context on acquisition of party attachments

	<i>Intercept</i>	<i>Education</i>	<i>Male</i>	<i>Age</i>	<i>Age</i> ²
Social heterogeneity	0.526 (0.247)*	−0.038 (0.031)	−0.156 (0.055)**	−0.047 (0.052)	0.01 (0.013)
Number of electoral parties	0.187 (0.066)**	−0.031 (0.008)**	−0.04 (0.016)**	0.003 (0.014)	0.0002 (0.004)
Effective number of legislative parties	−0.484 (0.149)**	0.068 (0.019)**	0.071 (0.036)*	−0.011 (0.032)	0.005 (0.008)
Vote for candidate	−0.494 (0.161)**	0.074 (0.02)**	0.097 (0.036)**	0.026 (0.034)	−0.006 (0.009)
Candidate control of ballot	0.171 (0.19)	−0.035 (0.024)	−0.013 (0.044)	0.006 (0.04)	0.01 (0.011)
Logged weighted party age	0.181 (0.07)**	−0.018 (0.009)*	−0.065 (0.016)**	−0.023 (0.015)	0.003 (0.004)
Constant	−0.431 (0.373)	0.094 (0.047)*	0.396 (0.088)**	0.253 (0.08)**	−0.053 (0.021)**
Observations	24	24	24	24	24
R-squared	0.472	0.58	0.618	0.237	0.214

Note. The baseline is a 40-year-old female with a secondary education. Coefficients are estimates using linear regression with Borjas weights. Standard errors in parentheses.

* $p < .05$; ** $p < .01$

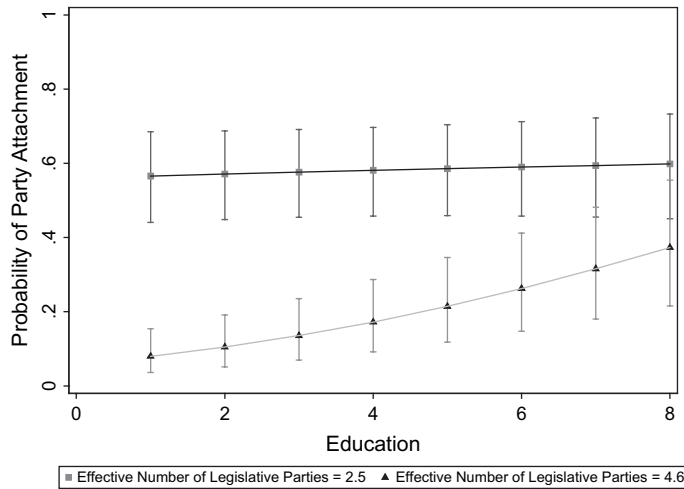


Fig. 2 Legislative fractionalization and party attachments across education levels (95% confidence intervals for female, age 40).

propensity of an individual to have party attachments, but less so among highly educated individuals. For example, for a 40-year-old female with the highest education possible (education = 8), the effect of a unit increase in the number of effective legislative parties is

$$\begin{aligned}
 & -0.48 \text{ (the effect for a female with education equal to five)} \\
 & + [0.07 \text{ (the effect of parties on education)} \\
 & \quad * 3 \text{ (the increase in education over the baseline)}] = -.27.
 \end{aligned}$$

In contrast, the effect of a unit increase in the number of effective legislative parties for a 40-year-old female with the lowest level of education (education = 1) is

$$-.48 + [.07 * -4 \text{ (the decrease in education over the baseline)}] = -.76.$$

Thus the results indicate that an increase in the effective number of legislative parties decreases the propensity of a 40-year-old female to form party attachments, but more so among those who are less educated. As we can see in Table 3, the results for all the other system-level variables are similar. In column 1, where the intercept from the level-one regressions is the dependent variable, the signs of the coefficients and their significance levels are virtually the same as what we found in column 2 of Table 2. The baseline level of party attachments increases with more electoral choice, social heterogeneity, and party-system age and decreases with the number of legislative parties and more candidate-centered parties. The effects of each of these results are greatest (in absolute magnitude) for the least educated individuals (because the signs of the coefficients in column 2 are the opposite of those in column 1).

Figures 2–5 graph some of the main results for our baseline individual. Education is on the horizontal axis and the predicted probability of forming a party attachment is on the vertical axis. The graphs depict probabilities for individuals in countries whose system-level variable is either one standard deviation above the mean of that system-level variable (triangles) or one standard deviation below the mean (squares). Each figure plots the point

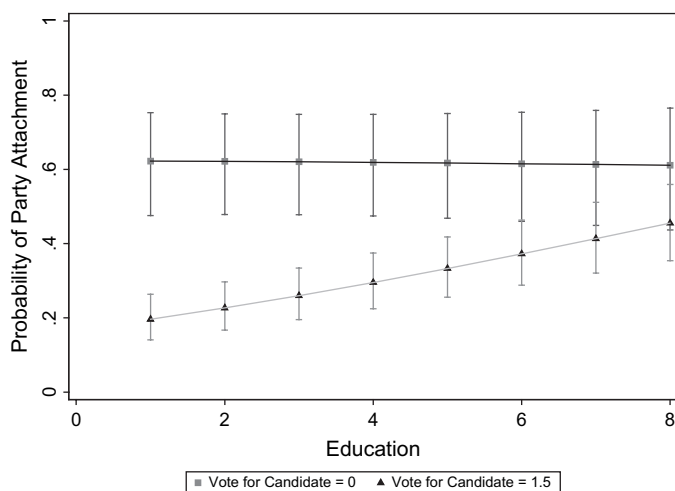


Fig. 3 Ballot structure and party attachments across education levels (95% confidence intervals for female, age 40).

estimates and 95% confidence intervals for the baseline individual to form party attachments in countries that hold the median values for the system variables not being analyzed in the figure. Figure 2, for example, illustrates the effects of the effective number of legislative parties. It compares the propensity of an individual to form a party attachment if she lives in a parliamentary democracy with 2.5 legislative parties (which is one standard deviation below the mean number of legislative parties) as opposed to 4.6 legislative parties (which is one standard deviation above the mean).

The general pattern in Figs. 2–5 is consistent with the integrated model shown in Fig. 1. In Fig. 2, when the number of legislative parties is 2.5, making it relatively easy to form retrospective judgments, the propensity to form attachments is relatively stable across education levels. When the number of legislative parties is 4.6, the propensity for

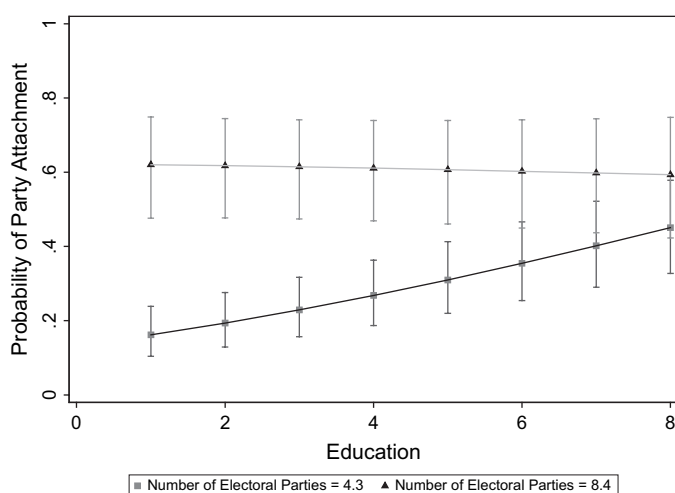


Fig. 4 Electoral choice and party attachments across education levels (95% confidence intervals for female, age 40).

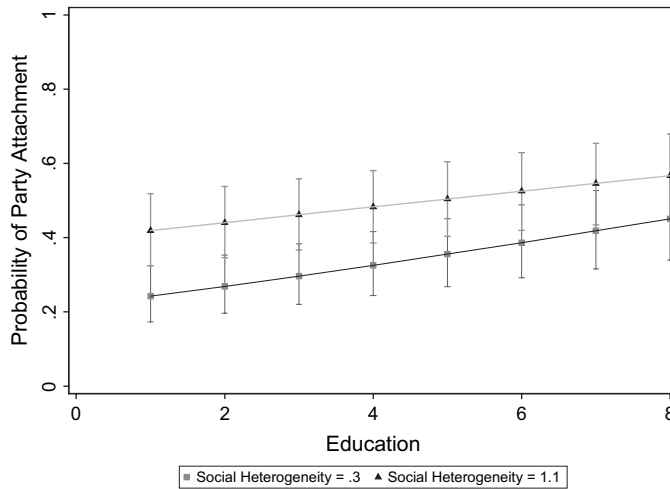


Fig. 5 Social heterogeneity and party attachments across education levels (95% confidence intervals for female, age 40).

individuals to form attachments is lower, though by how much depends on education level. Among individuals with the highest levels of education, the drop-off is essentially zero. Among the least educated, the drop-off is large and statistically significant. Thus the effect of moving from an institutional environment where it is relatively easy to form attachments to one where it is relatively difficult has a greater effect on less educated individuals. We see the same effect in Figs. 3 and 4. The propensity to form attachments declines with institutional environment when the ballots are candidate centered (Fig. 3) or the number of electoral parties is low (Fig. 4). With social heterogeneity (Fig. 5), however, we do not find an interaction with education. More educated individuals are more likely to form attachments regardless of the level of social heterogeneity, and all individuals are more likely to form attachments when social heterogeneity is high, but the impact of social heterogeneity does not vary with education.⁹

8 Conclusion

Our goal was to develop and test arguments about how political factors that vary cross nationally influence the acquisition of party attachments. To this end, we derived arguments from the “psychological attachment” and “running tally” perspectives, which previously had been applied predominantly to individual attributes rather than to system-level factors. We tested our hypotheses at different levels of aggregation of our independent variables: the observations in all countries were first pooled and then run as

⁹To facilitate presentation of the results, we have focused our attention on the baseline of a 40-year-old female. But the results from the fully interactive model in Table 3 allow us to explore questions about institutional effects for any type of individual. Figures 6–9, available as supplementary data online, present the results for other types of individuals and for legislative fractionalization. Though there are differences in the figures, each is supportive of the main result, which is that the probability of forming party attachments declines as the number of legislative parties increases, and it declines the most among the least educated individuals. Although it is beyond the scope of our discussion here to explore all the possible interactions, we can underscore the finding that the effect of institutional context varies with education; institutions have the greatest impact on individuals with low education.

separate regressions for different education levels. We also estimated a two-step model using a weighting strategy suggested in the economics literature for models with binary dependent variables in the first stage, a large number of observations in first-stage units (individual respondents in each country in our study), and a relatively small number of observations in the second stage (countries in our study). The two-level analysis provided a formal test of our interactive hypothesis that the effects of institutional context depend on individuals' education.

The empirical results confirm a systematic relationship between political context and party attachments. Consistent with the psychological attachment perspective, we find that party attachments increase with the salience of group identities (measured by social heterogeneity) and with the quality of electoral choice (which alleviates social cross pressures on individuals). Consistent with the running tally perspective, we find that party attachments increase with greater clarity of party responsibility (a low number of legislative parties) and with institutions that encourage party discipline (measured by ballot structure). We also find some support for the hypothesis that party attachments increase as a country's party system becomes more mature. (This finding is borne out in the subsamples analyses but not the two-step analysis.) Finally, our argument and evidence suggest that the impact of political context on the formation of party attachments is not invariant across individuals. Instead, system-level factors that discourage party attachments have their strongest effects on individuals with low education levels.

The analysis has two important implications for future research that are worth underscoring. First, as described at the outset of the article, scholars have spent so much energy studying party identification not because it is intrinsically interesting but because it has been linked to many other attitudes or behaviors that are substantively important (such as vote choice, participation, or the interpretation of information). We have argued that the propensity of individuals to develop what we call "party attachments" varies systematically with the political context. This has implications for studies seeking to explain the impact of party attachments on behavior cross nationally. If institutions like disciplined parties impact the formation of party attachments, it seems likely that they may also shape the effect of party attachments on behavior.

Second, as noted in our penultimate section, we believe that future research on how political context influences individual attitudes or behavior should consider an explicitly interactive framework. We have argued in this article that there are theoretical reasons to believe that the effects of political context should depend on education levels, and the two-level approach allows us to uncover these interactions. Of course, there are many factors that may lead to such interactions. We found, for example, but did not explore, differences in the effect of institutions on party attachments for men and women. Research that does not consider such interactions runs the risk of having incomplete or misleading theoretical arguments and empirical evidence.

Supplementary data

Supplementary data are available at *Political Analysis* online (<http://www.pan.oxfordjournals.org/>).

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Errata

doi:10.1093/pan/mpi005

Institutional Context, Cognitive Resources and Party Attachments Across Democracies

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Political Analysis 13(4):365–386.

Table 1 should have appeared as it is set below.

Table 1 Party attachments and contextual variables in 25 countries

<i>Country</i>	<i>Proportion with party attachments</i>	<i>Social heterogeneity</i>	<i>Number of electoral parties</i>	<i>Effective number of legislative parties</i>	<i>Vote for candidate</i>	<i>Candidate control of ballot</i>	<i>Logged weighted party age</i>
Belgium	0.85	0.77	11	9.1	0	0.83	3.49
Australia	0.81	0.91	6	2.6	1	1	4.23
Israel	0.62	0.69	11	5.61	0	0	3.01
United States	0.54	1.31	2	2.01	2	1	4.96
Norway	0.52	0.26	7	4.36	0	1	3.85
New Zealand	0.51	1.21	6	3.76	0.5	0.54	3.88
Canada	0.49	1.41	5	2.98	2	1	4.4
Denmark	0.49	0.32	10	4.66	0	1	3.85
Poland	0.48	0.29	6	2.95	1	1	1.26
Iceland	0.48	0.27	5	3.45	0	0	3.79
France	0.48	0.51	8	2.24	2	1	2.88
Portugal	0.47	0.19	5	2.58	0	0	3.23
Sweden	0.46	0.29	7	4.29	0	1	4.33
Britain	0.46	0.82	4	2.12	2	1	4.67
Czech Republic	0.44	0.98	6	4.15	0	1	1.39
Bulgaria	0.42	1	5	2.92	0	0	1.7
Spain	0.41	0.87	5	3.14	0.01	0.5	2.94
Japan	0.37	0.55	6	2.94	1.2	1	3.16
Switzerland	0.36	1.14	10	5.95	1.02	1	4.36
Germany	0.36	0.83	5	3.3	1	0.5	3.89
Hungary	0.35	0.68	7	3.45	0.91	0.46	2.29
Lithuania	0.31	0.74	5	3.27	1.01	0.5	1.89
Netherlands	0.28	0.83	9	4.79	1	0	3.64
Ireland	0.26	0.28	6	3.34	1	1	4.25
Slovenia	0.19	0.51	6	4.38	0.04	1	1.77