Social Diversity Affects the Number of Parties Even under First-Past-the-Post Rules

October 26, 2015
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Abstract: Nearly all systematic empirical work on the relationship between social diversity and the number of parties suggests that there is an interaction between electoral rules and diversity. Most analyses assert this interactive hypothesis and make a strong case that social heterogeneity leads to party fragmentation under permissive electoral rules, but that a psychological effect mitigates the power of social forces to promote party proliferation under single-member district, first-past-the-post rules. Some recent work has begun to challenge this central tenet within the study of electoral systems, but these alternative viewpoints have provided contrasting arguments and findings and used different types of data than previous research. This paper is the first analysis that appropriately tests the interactive hypothesis in that we use district-level measures of *both* ethnic diversity and the effective number of parties and we consider a curvilinear relationship between social diversity and party fragmentation in elections to national legislatures. Unlike most previous cross-national studies, we find that there is a strong relationship between social diversity and the number of parties even under first-past-the-post electoral rules, thus suggesting that restrictive rules are not as powerful a constraint on electoral behavior and outcomes as is usually supposed.

The dominant view within the comparative politics literature on electoral systems and political parties can be termed the "interactive hypothesis" – electoral rules interact with social diversity to determine the number of parties competing in elections (Duverger 1954, Ordeshook and Shvetsova 1994, Amorim Neto and Cox 1997, Clark and Golder 2006, Geys 2006, Cox 1997, Singer and Stephenson 2009). As explained cogently by Duverger (1954) and Clark and Golder (2006), social diversity creates the foundation for the party system: Where there is little diversity, there tends to be few parties, but higher levels of social heterogeneity tend to be associated with greater party fragmentation. At the same time, this mapping of social diversity onto the number of parties only occurs when electoral rules are "permissive," meaning that even small parties can win office. Put differently, it is generally agreed that, in permissive electoral systems, such as proportional representation (PR) with large numbers of seats per district and low legal thresholds of representation, greater social heterogeneity promotes party fragmentation.

In contrast, a rich literature argues that "restrictive" rules constrain the number of parties, thus leading to few parties irrespective of the level of social heterogeneity. Framed most starkly by Clark and Golder (2006), but also noted in numerous empirical studies (see especially Ordeshook and Shvetsova 1994, Amorim Neto and Cox 1997, Singer and Stephenson 2009), plurality or first-past-the-post (FPTP) systems tend to limit party competition to no more than two candidates per district even if the district is socially diverse. Indeed, it is this very idea that underpins one of the most important and well-known theories of electoral rules: Duverger's Law, which holds that FPTP systems tend toward two parties.

To be sure, there have been challenges to this interactive hypothesis, but – and this is puzzling – even despite research that appears to undercut its microfoundations, these challenges have yet to provide evidence that seriously undercuts the hypothesis. The ideas underpinning

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Duverger's Law and the interactive hypothesis are founded in large part on the expectation of strategic voting under FPTP, but, as Cox (1997) notes, there are multiple conditions under which voters will be unlikely to act strategically. Moreover, empirical work by scholars such as Alvarez et al. (2006) indicates that in fact large numbers of voters do not behave strategically in FPTP elections even when they have a competitive reason to do so. This lack of strategic behavior ought to produce a positive correlation between social diversity and party fragmentation. Nevertheless, the literature offers only very limited evidence at best of a link between social heterogeneity and the number of parties under FPTP, as would be implied by the Cox and Alvarez et al. work.

In this paper, we argue that, in fact, the interactive hypothesis does not accurately represent real world outcomes, and that the dearth of strong evidence to counter the hypothesis is a result of shortcomings in the case selection, data used, and assumptions made to set up the tests conducted in the extant literature. More specifically, we argue that an appropriate test of the relationship between social heterogeneity and the number of parties under FPTP will combine three features in its analysis: First, some may question the generalizability of the findings drawn from analyses of party fragmentation in plurality elections within mixed-member electoral systems, in new democracies, or presidential elections, so an appropriate test of the hypothesis will include analysis of legislative elections in pure plurality systems in established democracies such as Great Britain and the United States. Second, the data in support of the analysis needs to be drawn from the subnational (especially district) level. Duverger's Law is founded on a district-level logic, in which the district number of parties is a function of social diversity and electoral rules in the district, but with the exception of Potter (2014) all cross-national analyses of the interactive hypothesis are founded on national-level measures of at least one of the key

variables. Third, recent evidence suggests that the effect of diversity on party fragmentation may not be linear (Dickson and Scheve 2010, Moser and Scheiner 2012, Stoll 2013, Raymond 2015), so an appropriate test of their relationship under FPTP will need to consider the possibility of a non-linear relationship.

Following these principles, we create an original data set of *district-level* social diversity – like most work on this topic (especially Amorim Neto and Cox 1997, Clark and Golder 2006, Singer and Stephenson 2009, Singer 2012), mostly coded as ethnic diversity – and the number of parties under plurality rules in ten different countries, which we use to provide systematic evidence that social diversity does indeed shape the number of parties under FPTP rules. More specifically, we conduct district-level, country-specific analyses of multiple plurality legislative elections in Canada, Great Britain, India, New Zealand, Papua New Guinea, Russia, Scotland, Ukraine, the US, and Wales. The results for the US are largely consistent with the interactive hypothesis and Duverger's Law, whereby the number of parties tends to be capped around two (and in fact is negatively correlated with social diversity). However, for all of the other nine countries, increases in social diversity tend to be associated with increases in the number of parties – but only up to up to a certain level of diversity, after which there is no further increase in party fragmentation and, for many countries, there is even a decline in party fragmentation. Our findings lead us to reject the most commonly held "strong" interactive hypothesis, which argues that social diversity will have no effect on the number of parties under FPTP, but they provide support for a "weaker" interactive hypothesis that is consistent with the fundamental premise of Duverger's Law.

The remainder of the paper is structured as follows: First, we discuss the interactive hypothesis – that social heterogeneity has a positive, linear effect on party fragmentation, but that

this relationship will tend to exist only under permissive rules – and the significant empirical support for the proposition. Second, we highlight reasons to question the accuracy of the hypothesis and suggest principles to better test its core premise – that the number of social divisions should not shape the number of parties under FPTP. Third, we introduce our new data set of district-level social diversity and party fragmentation in ten countries, and we show the results of our country-by-country OLS model results that demonstrate a "curvilinear" (upside down u-shaped) relationship between the two variables in every country except the US. Using different data from ours, other scholars previously found a relationship between social diversity and the number of parties only under permissive rules. We reanalyze the data used in this previous work (Clark and Golder 2006), but consider the possibility of a non-linear relationship between diversity and the number of parties: Using these other data, we find clear evidence of a relationship between social heterogeneity and party fragmentation under permissive and restrictive rules alike.

The Interactive Hypothesis: Social and Ethnic Diversity, Electoral Systems, and the Number of Parties

Most scholars, whether they are defenders or critics of the interactive hypothesis, have described the "conventional wisdom" regarding the relationship between social diversity, electoral systems, and party fragmentation as follows: Social heterogeneity provides the "raw material" for the number of parties found in a country (Duverger 1954, Powell 1982, Clark and Golder 2006). Electoral rules provide a filter that allows or prevents such forces from being manifest as political parties. Consequently, societies with more social groups should have larger numbers of political parties *as long as the electoral system is permissive enough to allow such*

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groups to form the basis of their own parties. In perhaps the most well-known recent articulation of this interactive model, Clark and Golder argue that, "The central hypothesis Duverger's theory generates is that social heterogeneity should increase the number of parties *only once the electoral system is sufficiently permissive …* [and] [w]hen we actually test Duverger's theory with a fully specified model, we find that the results are remarkably consistent with Duverger's expectations" (2006: 704 – emphasis added). Cox (1997) in his classic work, *Making Votes Count*, offers the same formulation: "a polity can tend toward bipartism either because it has a strong electoral system or because it has a few cleavages. Multipartism arises as the joint product of many exploitable cleavages and a permissive electoral system" (221). Ordeshook and Shvetsova (1994: 122) argue that "if district magnitude equals one, then the party system is relatively 'impervious' to ethnic and linguistic heterogeneity." What's more, even those who challenge the interactive model, such as Dickson and Scheve (2010), state, "empirical studies demonstrate a positive relationship between ethnic fractionalization and the number of candidates or parties under so-called 'permissive' electoral systems, but little if any relationship when institutions are not 'permissive'" (349). Other major studies on the interactive effects of social cleavages and electoral rules on the number of parties offer the same conditional hypothesis – social diversity promotes party proliferation *but not in plurality electoral systems* (Brambor et al. 2006, Singer and Stephenson 2009, Singer 2012).

This notion that social cleavages and electoral systems have an interactive effect on party system fragmentation represents a combination of the two dominant approaches to studying the nature of party systems: the sociological and institutional schools. The sociological school highlights the importance of social cleavages – that is, societal divisions such as class or ethnic differences. Lipset and Rokkan's (1967) seminal work exemplifies the sociological school's

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emphasis on social cleavages as the critical factor determining various characteristics of the party system, including the number of parties within a country. The institutional school emphasizes the effect of electoral systems in allowing or limiting the formation of parties around social divisions (see, e.g., Rae 1967, Lijphart 1994). Scholars such as Clark and Golder (2006) argue cogently that, all else being equal, (a) social diversity promotes party proliferation by producing discrete electoral constituencies that will support different political parties, but (b) the electoral system serves as a filter for these social cleavages. Electoral systems with higher district magnitudes, and thus lower effective electoral thresholds, allow more social cleavages to be represented by distinct parties. Electoral systems with lower district magnitudes restrict those opportunities because of their bias against smaller parties. Most notably, FPTP systems in single-seat districts create incentives for weak parties and candidates to exit the race and for voters to cast ballots strategically only for potentially competitive candidates. Following this logic, there is a winnowing process, whereby ultimately in FPTP systems there ought to be no more than two candidates per district, irrespective of the level of social diversity.

There is substantial empirical evidence in support of the hypothesis that plurality elections prevent social cleavages from affecting the number of parties. Most of the prominent cross-national work on the topic analyzes this relationship using data at the national level – a single nationally aggregated measure of the effective number of ethnic groups for each country and the nationally aggregated Laakso-Taagepera (1979) measure of the effective number of parties for each election in each country. Each of these studies finds strong empirical support for the same conclusion – as a country's average district magnitude (the number of seats in a district) increases, the effect of ethnic diversity on the party system increases as well. Most important, for our purposes here, in plurality elections the number of parties has no discernible relationship

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with ethnic diversity (Amorim Neto and Cox 1997, Clark and Golder 2006, Cox 1997, Ordeshook and Shvetsova 1994). Since the effects of electoral rules are expected to be most direct at the district level, more recent work by Singer and Stephenson (2009) and Singer (2012) take the important step of analyzing the factors that shape the district-level number of parties. Still using a national measure of ethnic diversity, these studies also find no statistically significant relationship between social cleavages and the effective number of parties in plurality elections, thus supporting the interactive relationship between diversity and electoral rules.[1]

In short, significant analysis suggests that there is a *positive, linear relationship between social cleavages and party systems* – increasing diversity leads to more parties – *and that the relationship largely disappears under FPTP rules*.

Challenging the Interactive Hypothesis

Despite the long list of theoretical and empirical work in support of the interactive hypothesis, there are good reasons to challenge this thesis. Perhaps most striking, strategic defection by political actors underpins the logic of the interactive hypothesis, but in reality only a subset of all voters actually does defect strategically (see, e.g., Alvarez et al. 2006, Cox 1997: 83-4). To some extent, the lack of strategic defection by many voters is undoubtedly a result of the fact that their preferred party or candidate is already competitive. However, in many cases, it appears that the lack of strategic defection is simply the result of a preference for one candidate – even one who is uncompetitive – over all others. For example, looking at the multi-candidate context of elections in the UK, Alvarez et al. (2006) find that even among voters who prefer a

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[1] Singer (2012) introduces a different variable, the TF ratio, which is the combined vote share received by all parties finishing fourth or worse divided by the vote share received by the second-place party. This variable is intended to capture electoral support for small parties. Using this variable, Singer finds some limited support that greater ethnic diversity increased support for minor parties in plurality elections (2012: 215).

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totally uncompetitive candidate, only roughly half strategically defect from their top choice to a more competitive alternative. There may be many reasons for such expressive voting.[2]

However, whatever the reason for it, a significant lack of strategic defection ought to undercut the logic of the interactive hypothesis: Even if a majority (i.e., fifty-plus percent) of voters casts ballots for one of the top two candidates, if (a) not all small parties (or candidates) exit the race and (b) a relatively large proportion of voters continue to support their top preference irrespective of the chances of success, we are likely to see a relationship between social diversity and the number of parties under FPTP. That is, if a substantial number of voters and elites choose not to defect strategically in FPTP races, the restrictive rules will not eliminate the influence of social diversity on the number of parties.

Indeed, in related work that has implications for the interactive hypothesis, some scholars have pointed to the regular exceptions to Duvergerian equilibria in plurality elections as reason to question the generalizability of its underlying logic. It is clear that both Canada and the UK consistently have more than two competitive candidates competing in their plurality electoral districts (see, e.g., Gaines 1999, 2009, Johnston and Cutler 2009). And noting the persistence of third- and lower-ranked parties in long-standing plurality systems of Great Britain, Canada, and India, Grofman, et al. (2009: 6) argue that Duverger's "prediction of two parties is not really so robust."

That being said, examples of these kinds do not address issues of social diversity and the interactive hypothesis directly, and to this point no work has been able to provide a thorough empirical challenge to the interactive hypothesis. Taagepera and Grofman (1985) offer perhaps

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[2] For example, Cox (1997: 79) notes that Duverger's Law will be less likely to hold when voters overwhelmingly prefer their favorite party to any other and, hence, see little significant difference between their second and lower preferences. Any voter who weights her preferences in this way will find little benefit from casting strategic ballots away from her most preferred party.

the most strongly stated systematic challenge to the hypothesis, arguing that social diversity affects the number of parties under any electoral system, and that, "the effective number of parties tends to be obtained by adding 'one' to the number of issue dimensions" (Taagepera and Grofman 1985: 341). But their empirical analysis is more preliminary than definitive, as it is founded on fairly subjective variable measurement (drawn from Lijphart 1984 – see Gaines 1999) and only four plurality cases with little variation across them.

Nevertheless, in the face of significant evidence of large numbers of voters who do not cast strategic ballots, the lack of evidence challenging the interactive hypothesis is somewhat puzzling – but two factors may be responsible for this lack of evidence. First, nearly all systematic cross-national analysis of the hypothesis uses nationally aggregated data, which typically will provide a poor measure of conditions at the district level, where Duverger's logic holds. Second, the interactive hypothesis implicitly assumes a monotonically positive correlation between social diversity and the number of parties, which may not be an accurate representation of the true relationship between the two variables.

The importance of district-level analysis in studying the relationship between social diversity and party fragmentation

The extant literature's use of *nationally aggregated* measures of at least one of the key variables it uses to test the interactive hypothesis creates at least some doubt about the accuracy of the analysis. The direct effect of electoral systems is at the *district* level, and theories that seek to explain the effective number of elective parties rely first on a district-level logic (see, e.g., Duverger 1954, Cox 1997, Singer and Stephenson 2009). For example, Duverger's Law is founded on the logic that voters and elites *within a district* seek to affect the outcome of that

district's race (Cox 1997). Social diversity at the national level may be wildly different from diversity in any given district, and the number of parties in any given district may be very different from what we see once votes from all districts are aggregated (see Riker 1986, Cox 1997). Even where a group is in the minority across most of the country, it may be able to win a seat in an SMD in which it actually makes up a majority of the population. A study based purely on nationally aggregated data would miss the fact that this national minority is quite large in some districts, and such a study would misinterpret the reasons that a party representing such a group might win votes under FPTP rules. Moreover, the aggregate number of parties at the national level is the sum of the votes for parties across all districts in the country, and could easily misrepresent what occurs at the district level. At the most extreme, the expected Duvergerian (two-candidate) outcome in each district could lead to hundreds of different parties winning votes and seats nationally – i.e., a large number of parties according to the nationally aggregated measure – if different parties compete in each district.

Nevertheless, because it has long been difficult to acquire such data, it is unusual for comparative work on the number of parties to use district-level measures of ethnic diversity. Most cross-national studies (Amorim Neto and Cox 1997; Clark and Golder 2006; Ordeshook and Shvetsova 1994) use nationally aggregated measures of both the number of parties and ethnic diversity. Singer and Stephenson (2009) examine the number of parties at the district level, but use nationally aggregated measures of ethnic diversity. Jones (1997) and Madrid (2005) offer insightful district-level work on diversity and the number of parties in legislative elections,[3] but although both studies find a clear association between social diversity and the number of parties neither study offers a direct analysis of the relationship in plurality elections.

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[3] Jones (1997) provides a district-level analysis of American House of Representatives elections in the state of Louisiana and shows a clear, positive relationship between racial heterogeneity and the effective number of

Ferree et al. (ND) offer a strong district-level empirical challenge to the interactive hypothesis. Examining local elections in South Africa, they use SMD-level measures of all of their key variables to show a positive relationship between racial diversity and party fragmentation. Ferree et al.'s analysis is compelling, but it is difficult to generalize from a study of behavior in local elections in a relatively new democracy.

Potter (2014) offers perhaps the most sophisticated and comprehensive district-level analysis of the interactive hypothesis. Potter cleverly uses probabilistic topic modeling of survey results to estimate district-level measures of latent social diversity across a wide array of dimensions (ethnicity, language, religion, income, the rural-urban divide, and support for the democratic regime) and countries. Interestingly, in his base model, Potter finds a positive correlation (with the 95 percent interval almost entirely positive) between district-level diversity and number of parties, irrespective of the permissiveness of the electoral system, but the results are not robust. In his central analysis, Potter includes interactions (for both district magnitude and district-level diversity) with nationally aggregated measures of diversity, and in turn finds no statistically significant relationship between any form of diversity and the number of parties under single-member districts (see Potter 2014, Table 5).

To be sure, Potter's analysis may be accurately capturing a lack of a correlation between social diversity and party fragmentation under restrictive rules, but it may also be that components of his analysis make it harder for him to capture the relationship. Potter's imputed measure of social diversity may not accurately represent true diversity within a given district and/or the multiple interactions in his model may affect our ability to draw inferences about the effects of district-level diversity, specifically. Another possibility, though, is that any study that

candidates under two-round majority single-member district rules. Madrid (2005) examines electoral results at various subnational levels under different electoral rules in Bolivia, Ecuador, Guatemala, and Peru and finds a relationship between diversity and the number of parties.

treats the relationship between social diversity and party fragmentation as positive and linear may find it difficult to identify a clear link between the two variables.

The relationship between social diversity and party fragmentation may not be linear

Indeed, most studies of the effect of social diversity on party fragmentation assume the relationship as positive and linear, but there is in fact good reason to suspect that this assumption is incorrect. In fact, Stoll (2013) explicitly argues that there is good reason to expect a "curvilinear" (inverted u-shaped) relationship between social diversity and the number of parties. Stoll's argument is straightforward at low to medium levels of diversity, where she posits that the number of salient cleavages ought to map onto the number of parties, but the expectation is more counter-intuitive at higher levels of diversity: Where there are larger numbers of (especially small) groups, there is little likelihood that any of those groups will be an electoral or government player by itself. In such cases, political entrepreneurs have an incentive to create parties (or promote candidates) that can gain the support of multiple groups. In this way, the presence of a large number of groups may promote behavior by elites that actually leads to *fewer* parties. Probably the most straightforward case of high social diversity leading to a small number of parties is where a single party becomes the principal target of most ethnic minorities' votes. For example, for many years in the U.S., African American and Latino voters have been especially likely to cast their ballots for the Democratic Party. And, indeed, Stoll provides compelling evidence of the existence of a non-linear relationship between social diversity and the number of parties under permissive legislative electoral rules: Increases in diversity lead to larger numbers of parties up to a point, after which greater diversity leads to fewer parties.

The work of Raymond (2015) gives further reason to believe that there is no simple positive correlation between diversity and party fragmentation. In an argument that is similar to Stoll's, Raymond sees a similar upside-down u-shaped relationship between ethnic diversity and party systems that is due to a dynamic in which extreme diversity produces groups that do not have the critical mass to elect their own representative. Consequently, in a context of many small ethnic groups, there are incentives to form multiethnic coalitions to win office. Such coalition building across ethnic groups tends to decrease the number of parties competing (Raymond 2015: 109-110).

Neither Stoll nor Raymond uses data from the district level in restrictive legislative elections[4] – and largely avoid making an argument about the likely effects of restrictive rules – but Dickson and Scheve (2010) focus explicitly on how Duvergerian strategic behavior can promote a very different sort of non-linear relationship between social diversity and party fragmentation in plurality elections: More specifically, where a social group is sufficiently large that it can split its vote among more than one candidate (each of whom would represent the group) and still defeat a candidate of another group, then that (largest) group ought to be willing to run more than one candidate. In this scenario, the number of candidates peaks when the size of the largest group is quite large (and, therefore, the effective number of groups is small). However, once the largest group drops below 66% of the population (and the effective number of groups increases), the model posits that the total number of candidates will actually drop, as the largest group would risk losing the seat by running more than one candidate. In these scenarios, in contexts of relatively high social homogeneity, the relationship between social diversity and the number of parties should actually be negative. Dickson and Scheve find support for their

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[4] However, Stoll examines presidential elections and finds a similar relationship between diversity and party fragmentation that she does under permissive legislative electoral rules.

model by testing it in the context of presidential elections, in which political actors have especially strong incentives to behave strategically. At the same time, Dickson and Scheve, themselves, acknowledge that their model of highly strategic behavior may not hold in legislative elections (Dickson and Scheve 2010: 365, Fn. 20), which is the focus of the interactive hypothesis. Indeed, it is in the context of legislative elections, specifically, that work such as Alvarez et al.'s (2006) indicates that relatively few voters actually cast strategic ballots, thus further suggesting that Dickson and Scheve's model may be less likely to hold beyond presidential elections.

In fact, Moser and Scheiner's (2012) analysis of the relationship between diversity and party fragmentation in mixed-member electoral systems in New Zealand, Russia, Ukraine, and Wales offers evidence that the inverted u-shaped relationship laid out by Stoll and Raymond may actually hold as well at the district level in plurality legislative elections. Moser and Scheiner examine two-vote legislative electoral systems – in which voters cast one ballot for a party in PR and one for a candidate in a plurality SMD – and measure, each aggregated at the SMD level, social diversity and the number of parties under both SMD and PR balloting. Not surprisingly, Moser and Scheiner's analyses typically show more party fragmentation under PR rules, but strikingly their cases exhibit the same inverted u-shaped relationship demonstrated by Stoll and Raymond, and these relationships are nearly identical under both PR and plurality balloting. Nevertheless, just as was the case with the Ferree et al. (ND) analysis, questions might be raised about the case selection in Moser and Scheiner's analysis: All four countries use mixed-member electoral systems, thus raising questions about the extent to which behavior in their SMD races is truly independent of behavior in their PR tiers, and therefore truly comparable to pure plurality systems. Moreover, as Moser and Scheiner, themselves, note, there is far less strategic behavior

in general in new democracies, such as Russia's and Ukraine's, thus making it difficult to generalize from them about the interactive hypothesis in established democracies.

What is needed to address the issue of social diversity and party fragmentation under plurality rules

In short, despite reason to question its core theoretical assumptions, the empirical support for the interactive hypothesis is compelling and has faced little serious challenge. To be sure, challenges have emerged, but their empirics have been limited by case selection, key variable measurement, and, possibly, the specification of the form of the relationship between social diversity and party fragmentation. To more directly address the core ideas underpinning the interactive hypothesis, we argue that empirical analysis should take the following steps: First, to avoid criticisms of country case selection, any study should include multiple pure FPTP systems in established democracies. Second, it should measure both party fragmentation and social diversity at the single-member district level, where the interaction between them presumably would exist. Third, it should examine more than just the possibility of a linear arrangement, and specifically should run models that take into account the "curvilinear" relationship suggested by Moser and Scheiner, Stoll, and Raymond. In addition, to most appropriately test the conclusions of the extant literature, it would be ideal to take on the interactive hypothesis on its own terms by measuring social heterogeneity in the form that has been most used in the literature – ethnic diversity (see Amorim Neto and Cox 1997, Clark and Golder 2006, Singer and Stephenson 2009, Singer 2012).

A new *district-level* data set to study the relationship between social diversity and the number of parties under FPTP rules

We took these guidelines into account when we designed our study here. We use an original data set to analyze the relationship under FPTP between district-level social heterogeneity and the number of candidates in nearly 10,000 district-level races in lower house elections in Canada, Great Britain, India, New Zealand, Papua New Guinea, Russia, Ukraine, and the United States, as well as in Scotland and Wales.[5] For most of our country cases, we include multiple years of elections (see Table 1). We limit our analysis to those cases for which we could obtain subnational-level data on both social diversity and electoral results within FPTP elections. We measure the number of parties within each SMD in each election in our data set. In Canada, Great Britain, New Zealand, Russia, Scotland, the United States, Ukraine, and Wales, our measure of social diversity is the number of ethnic groups aggregated within the boundaries of each single member district. Data on ethnicity were not available for India and Papua New Guinea, and, therefore, our measures of diversity for those two countries are based on religion and language, respectively. In addition, unfortunately, census data were available only at the state/territory-level for India and at the province-level for Papua New Guinea. The state (India) and province (Papua New Guinea) are geographically larger than the SMDs in those countries, but still provide a better approximation of diversity within the SMDs than the nationally aggregated measure.[6]

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[5] We use the "Great Britain", rather than "United Kingdom" because our data do not include districts located in Northern Ireland. For Scotland and Wales, we use the districts used to elect the members of the Scottish National Parliament and the National Assembly for Wales, respectively.

[6] India is comprised of 28 states and 7 territories. The province is the primary administrative unit in Papua New Guinea. There are 20 provinces, but the autonomous region of Bougainville was created after our census data became available. Therefore, we limit our analysis to 72 districts in 19 provinces.

[Table 1 about here]

Table 1 presents the elections and measures of social heterogeneity used for each country.

These cases represent a range of political, electoral, and demographic contexts from a variety of

geopolitical regions. There is variation in the level of democratic consolidation: Canada, Great

Britain, India, New Zealand, and the United States have significant experience with democratic

elections. Russia, Ukraine, and Papua New Guinea democratized much more recently – and

Russia's democratization proved temporary. Our cases display institutional variation. All of our

data are drawn from district-level elections that use single-member district plurality rules, but

Russia, Scotland, Ukraine, and Wales have mixed electoral systems where voters simultaneously

cast a vote for a candidate in the FPTP balloting and one for a party in PR. New Zealand also

has used a mixed system since 1996,[7] but used a pure SMD-plurality system before then. Our

data set includes elections under both systems in New Zealand. Finally, there is considerable

socio-economic variation. Canada, Great Britain, and the United States have a GDP per capita of

more than $30,000 (US). India and Papua New Guinea have a GDP per capita of less than

$2,000 (US).[8]

To examine the effect of district-level social heterogeneity on the number of competitors,

we calculate, first, the effective number of SMD *candidates* per district using the Laakso-

Taagepera (1979) effective number of electoral parties (N) index, which weights all contestants

by their share of the vote.[9] N ranges from 1 (there are a number of uncontested districts in the

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[7] New Zealand, Scotland, and Wales use "linked" or mixed-member proportional (MMP) systems, where parties'
success in PR voting is the principal factor shaping the total number of seats a party will win. In contrast, Russia,
and Ukraine use "unlinked" or mixed-member majoritarian (MMM) systems, where each party's seat total is simply
the sum of the seats it wins in the separate SMD and PR races.
[8] Estimates based on the 2009 data compiled by the World Bank.
[9] $N = 1/\Sigma(v_i^2)$, where v_i represents the proportion of the vote won by each candidate in the district.

United States) to 27.14 (in the Goilala district in Papua New Guinea). Our outcome variable, therefore, is ln_N or the log of the district-level effective number of electoral parties/candidates (N).

As for our principal explanatory variable, we follow the most common approach in the literature, which uses ethnic fractionalization as the measure of social diversity (see Clark and Golder 2006).[10] In essence, the assumption is that ethnic diversity is a proxy measure of general social diversity: Higher levels of ethnic diversity ought to be associated with greater social heterogeneity in general. Following this assumption as well, we calculate the effective number of ethnic groups for each district in Canada, Great Britain, New Zealand, Russia, Scotland, Ukraine, the United States, and Wales (as well as the effective number of religious groups in India and effective number of language groups in Papua New Guinea). For all cases, we measure diversity as *G*, the log of the effective number of groups, which we compute using the same equation as for N (but replace vote share with the group's share of the population). The unlogged measure of G ranges from 1 to 23.22 – the latter being in the Madang province in Papua New Guinea.[11]

Testing whether there is a relationship between diversity and party fragmentation

Using these data, we test whether there is a link between social diversity and the number of parties. As we suggested earlier – and contrary to the interactive hypothesis – there is good reason to expect a relationship even under FPTP. Our simple hypothesis is that there will be a positive correlation between our core explanatory variable, G (the effective number of groups logged), and our outcome variable, N (the effective number of parties logged). We test this

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[10] For insightful exceptions, see Potter (2014) and especially Stoll (2008, 2013).
[11] We present the sources of our subnational census data in the Appendix.

hypothesis by running a separate OLS regression model for each country in our data set (with the district/election as the unit of analysis). We report the results for each country in Table 2.

[Table 2 about here]

The results in Table 2 provide mixed evidence for the simple hypothesis of a positive relationship between social diversity and party fragmentation. In four of the countries (India, Papua New Guinea, Scotland, and Ukraine), the coefficient on G is positive and statistically significant, but in four of the countries (Canada, New Zealand, Ukraine, and Wales) the coefficient is approximately zero (i.e., it is nonsignificant), and in three (Britain, Russia, and the US) the coefficient is actually negative and significant.[12]

However, as we noted earlier, there is good reason to expect that the relationship between diversity and party fragmentation is not linear. Indeed, in the scatterplots in Figure 1 we can actually see the curvilinear relationship we had earlier hypothesized. Figure 1 plots the effective number of parties (logged on the vertical axis) against the effective number of groups (logged on the horizontal axis) for each country in our data (again, with the district/election as the unit of analysis). Clearly, the case of the US offers no obvious correlation between the number of groups and party fragmentation. However, cases such as Papua New Guinea and Scotland appear to illustrate a pattern in which the number of parties goes up with the level of social diversity, but then flattens out at a fairly high level of diversity. And others, in particular Canada, Britain, and New Zealand, seem to show that increases in social heterogeneity are

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[12] If we leave all variables unlogged there is little change in the results. The principal difference is that in the model with unlogged variables the coefficient on G for Ukraine is nonsignificant (unlike the positive and significant coefficient in the model with logged variables).

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accompanied by greater party fragmentation, but that at high levels of diversity the number of

parties actually declines.

[Figure 1 about here]

In an effort to capture more systematically this seemingly nonlinear pattern, we rerun the

regressions from Table 2, but we now include in our models G^2, the square of G (the logged

effective number of groups). If, indeed, the number of parties increases at low levels of

diversity, but then stops increasing or even declines at higher levels of social heterogeneity, our

regression results should indicate a positive and significant coefficient on G, and a negative and

significant coefficient on G^2, since larger values of G will actually lead to a decline (or a halt in

the increase) in the number of candidates. We report the results of the regressions in Table 3.

[Table 3 about here]

The results in Table 3 offer strong evidence that there is a relationship between social

diversity and the number of parties under FPTP rules and that relationship is curvilinear. In

every single case except for the US, the coefficients are in the expected direction (positive for G

and negative for G^2), and except for G^2 in the Papua New Guinea model the coefficients are

statistically significant.[13]

The results for the two exceptions should not be surprising. A number of factors make it

likely that the U.S. will have fewer effective parties, hewing more closely to the two candidates

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[13] To help view the pattern suggested by the results, we plot the regression line/curve on each of the scatterplots in
Figure 1. We should note that there is no major difference in the signs and statistical significance of the coefficients
when we run the models with unlogged variables.

per district expected by Duverger's Law. In the U.S., the plurality rules used to elect the president, the concurrency of the presidential and legislative elections, and other campaign rules that privilege the Democratic and Republican Parties all give ambitious politicians strong incentive to affiliate with one of the top two parties.[14] Indeed, the results are consistent with the illustration for the US in Figure 1, which looks quite different from the other countries' in that the bulk of observations hover around (and even below) an ln_N score of .69 – i.e., roughly two effective candidates. Moreover, the smaller effective number of candidates at high levels of diversity – which is represented in the negative coefficient on G in the linear model for the US in Table 2 – is undoubtedly due to the fact that ethnic minorities such as African Americans tend to concentrate their votes on the Democratic Party. The positive relationship (and nonsignificant coefficient on G^2) between diversity and party fragmentation in Papua New Guinea is probably due to the fact that with the huge number of parties (and accompanying political norms) every election is essentially a lottery. Nearly all candidates will have a good chance of victory, and Duvergerian strategic defection no longer makes sense – thus, reducing the likelihood of consolidating the number of parties even at high levels of diversity.

Where we examine multiple elections in the same country, there is a potential problem with counting the same districts multiple times in the same regression (i.e., by using the district's results from multiple different elections). As a precaution, therefore, we rerun the models from Table 3, but now only include the last election for each country in our data set. The results, listed in Table 4, are largely consistent with our analyses in Table 3.[15] The signs on the

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[14] Of the other countries in our data set, only Russia and Ukraine (i.e., the only post-Soviet systems in our data set) are presidential systems. However, both use two-round majority rules to elect their presidents, and the presidential and legislative elections are not concurrent.

[15] We also rerun the models for New Zealand for just the period in which it used a pure FPTP system and just the last year (1993) it did so. In each case, the results remain consistent with those in Tables 3 and 4. For the US, we also rerun the regressions from Tables 3 and 4, but use data from 2006, a non-presidential election year. Here, too, the results are consistent with the 2008 analysis of the US.

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coefficients are the same for every set of results except for those for Wales. And the significant

coefficients in Table 3 remain significant in Table 4 except for those on the variables from

Canada, Scotland, and Wales. For a single election, Wales and Scotland both have a relatively

small number of districts, thus making statistical significance much less likely.[16] The regression

results for Canada in 2011 may be election-specific. More than other recent elections in Canada,

the 2011 race produced what was relatively close to a two-party outcome nationally, with the

Liberals and Bloc Québécois dropping down to 34 and four seats, respectively. In re-running the

regressions for each of the previous two elections (2006 and 2008) in Canada, the coefficients on

G (positive) and G^2 (negative) are statistically significant and in the expected directions.

[Table 4 about here]

It is beyond the scope of this paper to explain the reasons for this decline in the number

of parties at high levels of diversity, but based on data from Britain and New Zealand we can

speculate. Similar to the pattern of greater support for the Democratic Party – and, hence,

reduced party fragmentation – at high levels of diversity in the US, Figure 2 illustrates the

relationship between ethnic diversity and the share of the vote won by the Labour Party in New

Zealand in 2002 and Great Britain in 1997. As the figure shows, there is considerable variation

in the share of Labour's vote at most levels of diversity, but the Labour Party tends to do

exceptionally well in districts with more than two effective groups in both countries. In short,

increases in diversity promote greater party fragmentation, but the presence of large numbers of

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[16] Moreover, in some of the earlier elections in both Scotland and Wales, the direction on the coefficients and the levels of significance are more consistent with results in Table 3.

ethic minorities appears to promote greater Labour vote concentration, and, thus, a smaller number of parties.[17]

[Figure 2 about here]

Nevertheless, whatever the specific mechanisms underlying the decline in the number of parties at high levels of ethnic diversity, the curvilinear upside-down u-shaped pattern appears common in FPTP systems and ought to be taken into account in models of the relationship between social heterogeneity and party fragmentation.

Introducing G^2 into previous analysis leads to evidence of a curvilinear relationship between social diversity and the number of parties

The strong evidence in Tables 2-4 that there is a relationship between diversity and the effective number of candidates at the district level under "restrictive" first-past-the-post rules runs counter to nearly all recent work on the topic. We believe that our use of district-level data is an important step in uncovering this relationship, as only district-level data represents the interaction between society and the number of parties at the point that it actually occurs. At the same time, our analysis here suggests that the bulk of the literature's emphasis on linear models has caused it to miss the actual pattern representing the relationship between diversity and party fragmentation. And perhaps previous analyses would have found a relationship had they

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[17] Our principal aim in this paper is to demonstrate that even under restrictive rules the number of parties is associated with social diversity – even if measured through the proxy of ethnic diversity. If we establish that such a relationship does in fact hold, then future work will want to consider much more carefully the mechanisms linking social heterogeneity and the party system. Indeed, numerous questions about the mechanisms will ultimately be important to address since the Figure 2 examples highlight that ethnic cleavages are probably not what divides the party system. That is, it is unlikely that the Labour Party in these examples is campaigning simply on ethnic appeals in these highly ethnically diverse districts.

considered non-linear functional forms. To explore these potential reasons for our differences, we replicate Clark and Golder's (2006) analyses, but we include the quadratic, G^2, that help us recognize the existence of a curvilinear relationship between ethnic diversity and the number of parties.[18]

Clark and Golder's analysis focuses on the effect of three variables on the unlogged nationally aggregated effective number of electoral parties (*N*) in each country/election: (1) *G*, the (unlogged) nationally aggregated measure of ethnic diversity (based on Fearon 2003),[19] (2) *DM*, the log of the average district magnitude in a given country, and (3) *G X DM*, the interaction between ethnic diversity and the logged district magnitude.[20] Clark and Golder's cogent argument is that ethnic diversity will only affect the number of parties in permissive electoral systems – i.e., those with larger district magnitudes. Since the log of one is equal to zero, the coefficient on the uninteracted G variable represents the relationship between diversity and the number of parties in single-member districts. Indeed, Clark and Golder find that the uninteracted G variable never has a statistically significant relationship with the number of parties. However, the combination of the coefficients on the G, DM, and G X DM variables indicate that greater ethnic diversity leads to larger numbers of parties in established democracies as the district magnitude increases (i.e., the system becomes more "permissive").

However, when we use Clark and Golder's data to consider whether the relationship between diversity and the number of parties is curvilinear, we get very different results. We present the results in Table 5. Our replications focus, first, on the models that Clark and Golder

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[18] For the sake of clarity, we continue to use our own variable names.

[19] In practice, Clark and Golder's measure appears to represent the effective number of groups.

[20] Clark and Golder investigate a number of other factors that might affect the number of parties including: the number of upper tier seats (i.e., the number of seats used to compensate parties for disproportionality created by part of the electoral system), the interaction between upper tier seats and G, the number of presidential candidates, the temporal proximity of the presidential election to the legislative election, and an interaction between the number of presidential candidates and the timing of the presidential election. We include all of their variables in our replications.

use to demonstrate the impact of ethnic diversity on the number of parties under permissive rules in (a) established democracies in the 1990s (the last election for each country during the decade, using OLS), (b) for all elections (1946-2000, using OLS with robust standard errors clustered by country) in established democracies in their data set, and (c) for all elections (1946-2000, using OLS with robust standard errors clustered by country) in their data set. In our Table 5, Model 1, 4, and 6 perfectly replicate Clark and Golder's findings for these samples. In all three models, the coefficient on G is non-significant, thus suggesting that ethnic diversity is not correlated with the number of parties in single-member districts. And in the first two samples (i.e., one election for each established democracy in the 1990s, and all elections in established democracies over 1946-2000), G X DM has a large, positive coefficient, which suggests that the magnitude of the correlation between ethnic diversity and the number of parties increases with the permissiveness of the electoral system (i.e., as the number of seats increases).[21]

[Table 5 about here]

We add into the models G^2, the square of the ethnic diversity measure. As with our earlier analysis, if ethnic diversity has a curvilinear relationship with the number of parties, G will have a positive coefficient and G^2 will have a negative coefficient.[22] Model 2 replicates Clark and Golder's cross-sectional analysis of established democracies in the 1990s (Model 1) but now includes G^2 (and the interactions with G^2). In this new model, G X DM no longer has a significant coefficient. The uninteracted G and G^2 variables now have coefficients that are

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[21] See Figure 1 in Clark and Golder (2006: 701) for a graphical depiction of the combined impact of diversity and district magnitude on the number of parties.

[22] We also interact G^2 with all other variables that Clark and Golder interact with G: So, we also include G2 X DM and G^2 X % of Upper Tier Seats.

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consistent with curvilinearity, but neither is statistically significant. However, with the small number of cases – 39 countries – in this model, a single outlier could have a major impact on the results. More specifically, we believe that Italy, which is coded as having a district magnitude of one after 1992, inaccurately reflects the true impact of SMD rules on the number of parties: That is, after 1992 Italy used a mixed electoral system founded on 475 SMDs and 155 PR seats. A unique feature of the Italian mixed system was that parties could work together in an official alliance in SMDs – where they would jointly run a single candidate – but remain separate in the PR tier. As a result, despite district-level bipartism (2.43 effective candidates per Italian SMD in 1996), a large number of parties collected votes nationally – 7.06 effective parties according to Clark and Golder's data set. In a data set with a small number of cases, Italy undoubtedly has a major effect on the model estimates, so in Model 3 we drop Italy from the analysis.

Once we drop Italy from the 1990s established democracy data set, the analysis is consistent with our expectations and our earlier analysis in this paper: G has a positive coefficient (significant at the .066 level), and G^2 has a negative coefficient (significant at the .062 level). In short, among established democracies in the 1990s, our analysis of nationally aggregated data indicates a curvilinear relationship between ethnic diversity and the number of parties irrespective of the permissiveness of the electoral rules used. The result is especially striking in that the small number of observations makes statistical significance less likely.

Our replications of Clark and Golder's pooled models show a similar curvilinear pattern. As we noted, Model 4 perfectly replicates Clark and Golder's analysis of established democracies (multiple elections per country) in the postwar period and only shows a relationship between diversity and the number of parties under permissive rules. In Model 5, we add in G^2. As with Model 3, our pooled analysis of democratic countries (1946-2000) indicates a

curvilinear relationship between diversity and the number of parties irrespective of the permissiveness of the electoral rules. The coefficient on G is positive and the coefficient on G^2 is negative, and both are statistically significant.

When they extend their pooled analysis to all countries (including new democracies) in their data set, Clark and Golder find no correlation between diversity and the number of parties, but when we include the quadratic term, G^2, we find a relationship. Model 6 replicates Clark and Golder's analysis, where G X DM has a very small coefficient, thus indicating no relationship between diversity and the number of parties even under permissive rules. In Model 7, we add G^2 (along with the interactions with G^2), and we find a curvilinear relationship between diversity and the number of parties across all countries (1946-2000) in the data set irrespective of the district magnitude.

In short, when we analyze data utilized by previous work that appeared to show no relationship between diversity and the number of parties under non-permissive rules – but we now consider the possibility that the relationship is non-linear – we find strong evidence that social diversity affects the number of parties even under restrictive rules.

 Conclusion

Scholars since Duverger have highlighted the overwhelming constraining effect of single-member district, first-past-the-post rules. Indeed, nearly all systematic empirical work on the effect of social diversity on the number of parties suggests that there is an interaction between electoral rules and diversity (see especially Amorim Neto and Cox 1997, Clark and Golder 2006, Cox 1997, Duverger 1954, Ordeshook and Shvetsova 1994, Singer and Stephenson 2009). That is, most analyses make a strong case that social heterogeneity leads to party fragmentation under

permissive electoral rules, but that a psychological effect mitigates the power of social forces to promote party proliferation under FPTP rules. However, in this paper we provide substantial evidence that runs counter to most previous work: We demonstrate that even under first-past-the-post electoral rules there is a relationship between social diversity and the number of parties, thus suggesting that restrictive rules are not as powerful a constraint on electoral behavior and outcomes as is usually supposed.

Our findings are especially noteworthy in that they emerge from a new data set of *district-level measures of the central variables* that permits us to conduct cross-national district-level analysis of the relationship between social diversity and the number of parties in FPTP systems. Previous cross-national work on the topic founded its analysis principally on nationally aggregated measures, and therefore could not capture the direct relationship between diversity and the party system, which only exists at the district level. To help draw more valid inferences about these relationships, we compiled a new data set of subnational measures of social diversity and the number of parties in ten countries that hold legislative elections using FPTP rules. Our new data set uses the same variables as previous work, but unlike previous data sets calculates the central variables at the district level: Most previous work treated the effective number of ethnic groups as a proxy measure of social diversity, and we do the same (but now measure this variable at the district level). And, like previous work, we measure party fragmentation according to the Laakso-Taagepera (1979) effective number of parties index (but, again, at the district level).

Using the new data set, we find that increasing diversity usually leads to larger numbers of parties, but in districts with high ethnic diversity on average we actually see a flattening or even a decline in the total number of electoral contestants. We also re-ran the analysis of the

influential study of Clark and Golder (2006), which used nationally aggregated measures of the key variables. Once we treat the relationship between social diversity and the effective number of parties as non-linear, using Clark and Golder's national-level data we again find clear evidence that diversity affects the number of parties under SMD rules.

This finding has several important implications for the study of party systems and the factors that shape them. First, this analysis contributes to a growing body of work that suggests that strategic defection by voters and elites is not a universal outcome under FPTP rules. For example, Cox (1997) highlights how particular conditions are necessary for strategic Duvergerian outcomes. And our analysis contributes to recent work that has found that plurality elections often do not constrain district-level electoral competition to two parties (Grofman, et al. 2009, Diwakar 2007, Gaines 1999, Moser and Scheiner 2004, 2012).

Ultimately, these findings lead us to reject the commonly held strong version of the interactive hypothesis, but a weaker version of the hypothesis, involving Duverger's core logic, seems more plausible. As Duverger himself points out, FPTP "works in the direction of bipartism; it does not necessarily and absolutely lead to it in spite of all obstacles. This basic tendency combines with many others which attenuate it, check it, or arrest it" (1954: 228). And, as our analysis suggests, in most cases social diversity is a major factor that "attenuates" the effect of plurality rules.

Nevertheless, at the core of Duverger's theory about the effects of electoral rules is the idea that there ought to be more strategic behavior under FPTP than under other rules, and our results give us no reason to dispute this view. Indeed, consistent with Moser and Scheiner's (2012) findings of a difference in the number of parties in SMD and PR balloting in mixed systems, the results in Models 5 and 7 suggest that the effect of diversity on the number of

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parties is greater in larger magnitude districts – that is, as indicated by the coefficients on DM, G X DM, and G^2 X DM, the curve representing the relationship between diversity and party fragmentation is steeper. This result suggests that under more restrictive rules there may be greater strategic defection by political actors away from less viable options, which in turn reduces the number of parties. At the same time, we are reluctant to make too much of this finding at this time since nationally aggregated measures of both ethnic diversity and the number of parties only allow for much more indirect analysis of the relationship between diversity and party fragmentation. In any event, the differences between the effects of restrictive and permissive rules in this area will benefit from additional analysis in the future.

Moreover, our findings open up new arenas for study. Earlier work suggested that social diversity had little or no effect on the number of parties in plurality elections. Thus, although it has been useful for observers to consider how district-level social cleavages become aggregated into two large parties (according to the predictions of scholars such as Duverger), there has been little reason to consider whether (and how) different (social) minority groups promote their own distinctive candidacies and how political elites might seek to attract them to options outside of the largest two parties. However, when we find evidence that social diversity affects the number of parties under FPTP, it becomes important to try to determine the ways that diversity actually becomes channeled into a variety of district-level candidacies in plurality elections.

To decipher these mechanisms, future work will want to follow Potter's (2014) cue and compile district-level measures for a variety of different types of diversity. We believe that using ethnic diversity as a proxy for social diversity as a whole is a reasonable step to demonstrate that there *is* a relationship between social heterogeneity and the number of parties. Indeed, ethnic diversity has been the predominant proxy measure for social diversity in previous

work that has established the interactive model as the conventional understanding of how social cleavages and electoral systems combine to shape party systems. Ethnic homogeneity tends to suggest low levels of social diversity, and ethnic heterogeneity suggests greater social diversity. In fact, using a blunt proxy measure for general social diversity creates an especially hard test, and our finding of a correlation between this proxy measure and party fragmentation provides especially strong evidence of a general relationship.

However, understanding the mechanisms that translate diversity into distinct parties requires more information on what types of cleavages are salient. For example, just because increases in ethnic diversity are associated with larger numbers of parties does not mean that parties use ethnic appeals to attract voters. Rather, ethnic diversity may become channeled into the party system by means of other types of cleavages, such as class: In many cases, districts that have a small smattering of different ethnic groups may be more economically diverse than wholly ethnically homogeneous districts – and, thus, may produce multiple parties that represent different income groups. But then districts with many ethnic groups may actually be more economically homogeneous if many voters within such districts have low incomes, and thus may promote the predominance in low-income districts of a single party (such as Labour in the UK) that appeals to lower classes. In this way, the curvilinear relationship, along with the success of the Labour Party in highly ethnically diverse districts, that we see in Great Britain and New Zealand makes especially good sense if (a) low incomes predominate in highly ethnically diverse districts, and (b) class is a salient cleavage.

In this way, future work will want to spend greater energy highlighting more thoroughly the mechanisms by which social diversity becomes channeled into the party system. Scholars will do well to ask, to what extent does the number of parties track more closely to the amount of

income (or other forms of) diversity in a district than to the degree of ethnic diversity? Also, in a given polity, in what ways do parties (and candidates) try to appeal to voters and how do these appeals interface with the relationship between social cleavages and party systems? In highly ethnically diverse districts, do parties focus on ethnic appeals or, possibly, on class-based appeals? Moreover, the menu of choices is likely to affect the links between social diversity and party fragmentation. The existence or absence of ethnic parties may have important implications for the relationship between diversity and the number of parties.

Finally, our fundamental explanation in this paper for the correlation between social diversity and the number of parties even under FPTP rules is that many voters choose not to defect strategically even when electoral rules give them a strong incentive to do so. However, this lack of strategic voting – which Alvarez et al. (2006) demonstrate empirically – requires explanation. That is, future work will want to consider why there is so much less strategic voting than work by scholars such as Duverger (1954) and Cox (1997) argues should exist under first-past-the-post rules.

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Table 1. Description of Cases – Elections and Measures of Diversity

Country/Region	Elections Used	Measure of Diversity	Effective Number of Groups	Effective Number of Candidates
Canada	2004, 2006, 2008, 2011	Ethnicity	1.47 (1.01,5.09)	2.77 (1.40,4.13)
Great Britain	1992, 1997, 2001, 2005, 2010	Ethnicity	1.21 (1.01,3.38)	2.69 (1.43,4.29)
India	1998, 1999, 2004, 2009	Religion	1.47 (1.09,3.76)	2.81 (1.30,8.17)
New Zealand	1987, 1990, 1993, *1996, 1999, 2002, 2005, 2008, 2011*	Ethnicity	1.66 (1.04,3.76)	2.71 (1.62,5.86)
Papua New Guinea	2002	Language	9.75 (1.25,23.22)	13.96 (2.49,27.14)
Russia	*1995*	Ethnicity	1.37 (1.02,2.00)	5.92 (1.93,13.05)
Scotland	*1999, 2003, 2007, 2011*	Ethnicity	1.24 (1.01,1.89)	3.11 (1.96,4.77)
Ukraine	*1998, 2002*	Ethnicity	1.53 (1.02,2.99)	6.28 (1.39,17.28)
United States	2002, 2004, 2006	Ethnicity	1.90 (1.04,4.76)	1.75 (1.00,2.69)
Wales	*1999, 2003, 2007,2011*	Ethnicity	1.09 (1.02,1.62)	3.13 (1.93,4.93)

Notes:
- Sources for all data are listed in the Appendix.
- All measures of the effective number of parties are at the single-member district level.
- All measures of social diversity are measured at the single-member district level, except in:
  - India, where it is measured at the state level
  - Papua New Guinea, where it is measured at the province level
- Elections occurring under mixed electoral rules indicated in italics.
- Columns 4 and 5 present, for each country/region, the mean number of groups and the mean number of candidates, respectively (the range is given in parentheses).

Table 2. Linear OLS models of the district-level relationship between the effective number of ethnic groups and the effective number of parties

	Canada	Great Britain	India	New Zealand	Papua New Guinea	Russia	Scotland	Ukraine	United States	Wales
Log Eff. # Groups (G)	0.010 (0.013)	-0.102** (0.013)	0.116** (0.027)	0.043 (0.027)	0.304** (0.076)	-0.365** (0.129)	0.635** (0.063)	0.310* (0.123)	-0.101** (0.015)	0.049 (0.192)
Constant	1.002** (0.006)	0.985** (0.003)	0.959** (0.011)	0.956** (0.015)	1.878** (0.165)	1.819** (0.046)	0.992** (0.015)	1.600** (0.058)	0.602** (0.010)	1.118** (0.022)
N	1232	3064	2160	651	78	222	292	223	1741	158
R-squared	0.000	0.020	0.009	0.004	0.174	0.035	0.259	0.028	0.027	0.000

Notes:
- Standard errors in parentheses. * $p < .05$, ** $p < .01$
- Dependent variable: Log of the SMD-level effective number of electoral parties (Nv)
- Log Eff. # of Groups (G) = SMD-level effective number of ethnic groups (logged)
  - For India, Eff. # of Groups (G) = logged effective number of religious groups measured at the state level (larger than SMDs)
  - For Papua New Guinea, Eff. # of Groups (G) = logged effective number of language groups measured at province level (larger than SMDs)

Table 3. "Curvilinear" OLS models of the district-level relationship between the effective number of ethnic groups and the effective number of parties

	Canada	Great Britain	India	New Zealand	Papua New Guinea	Russia	Scotland	Ukraine	United States	Wales
Log Eff. # Groups (G)	0.145**	0.081*	0.913**	0.618**	0.636*	1.171*	1.144**	1.446**	-0.113*	1.622**
	(0.041)	(0.035)	(0.088)	(0.090)	(0.292)	(0.588)	(0.186)	(0.421)	(0.053)	(0.616)
G^2	-0.116**	-0.188**	-0.786**	-0.479**	-0.094	-2.064**	-0.955**	-1.266**	0.010	-4.183**
	(0.033)	(0.040)	(0.083)	(0.072)	(0.080)	(0.771)	(0.328)	(0.449)	(0.040)	(1.558)
Constant	0.988**	0.979**	0.801**	0.832**	1.646**	1.624**	0.945**	1.443**	0.605**	1.041**
	(0.007)	(0.004)	(0.020)	(0.023)	(0.257)	(0.086)	(0.022)	(0.080)	(0.015)	(0.036)
N	1232	3064	2160	651	78	222	292	223	1741	158
R-squared	0.010	0.021	0.048	0.068	0.189	0.066	0.280	0.062	0.027	0.045

Notes:
- Standard errors in parentheses. * $p < .05$, ** $p < .01$
- Dependent variable: Log of the SMD-level effective number of electoral parties (Nv)
- Log Eff. # of Groups (G) = SMD-level effective number of ethnic groups (logged)
  - For India, Eff. # of Groups (G) = logged effective number of religious groups measured at the state level (larger than SMDs)
  - For Papua New Guinea, Eff. # of Groups (G) = logged effective number of language groups measured at province level (larger than SMDs)
- G^2 = The square of the log of the effective number of groups

Table 4. "Curvilinear" OLS models of the district-level relationship between the effective number of ethnic groups and the effective number of parties – only most recent election per country in the data set

	Canada	Great Britain	India	New Zealand	Papua New Guinea	Russia	Scotland	Ukraine	United States	Wales
Year	2011	2010	2009	2011	2002	1995	2011	2002	2008	2011
Log Eff. # Groups (G)	0.109	0.269**	0.712**	0.583*	0.636*	1.171*	0.783	1.446**	-0.082	-0.468
	(0.086)	(0.069)	(0.190)	(0.271)	(0.292)	(0.588)	(0.515)	(0.421)	(0.126)	(0.882)
G^2	-0.016	-0.400**	-0.764**	-0.461*	-0.094	-2.064**	-1.711	-1.266**	-0.058	1.646
	(0.070)	(0.079)	(0.180)	(0.193)	(0.080)	(0.771)	(1.171)	(0.449)	(0.093)	(2.265)
Constant	0.953**	1.036**	0.963**	0.715**	1.646**	1.624**	0.954**	1.443**	0.638**	1.044**
	(0.015)	(0.007)	(0.043)	(0.084)	(0.257)	(0.086)	(0.032)	(0.080)	(0.038)	(0.048)
N	308	631	540	70	78	222	73	223	436	40
R-squared	0.036	0.048	0.034	0.088	0.189	0.066	0.032	0.062	0.056	0.023

Notes:
- Standard errors in parentheses. * $p < .05$, ** $p < .01$
- Dependent variable: Log of the SMD-level effective number of electoral parties (Nv)
- Log Eff. # of Groups (G) = SMD-level effective number of ethnic groups (logged)
    - For India, Eff. # of Groups (G) = logged effective number of religious groups measured at the state level (larger than SMDs)
    - For Papua New Guinea, Eff. # of Groups (G) = logged effective number of language groups measured at province level (larger than SMDs)
- G^2 = The square of the log of the effective number of groups

Table 5: Replicating Clark and Golder (2006) – includes quadratic terms to consider possibility of curvilinear relationship between diversity (G) and party fragmentation

	(Model 1) 1990s	(Model 2) 1990s Quadratic	(Model 3) 1990s Quadratic/ No Italy	(Model 4) Pooled/ Established Democracies	(Model 5) Pooled/ Established Democracies with Quad.	(Model 6) Pooled	(Model 7) Pooled with Quadratic
Eff. # of Groups (G)	-0.703 (0.677)	6.990 (5.989)	10.441+ (5.436)	0.112 (0.143)	0.506** (0.249)	0.192 (0.129)	0.529*** (0.169)
G^2		-1.977 (1.577)	-2.779+ (1.424)		-0.035** (0.017)		-0.038** (0.015)
DM	-0.610 (0.589)	0.617 (2.512)	1.794 (2.262)	0.078 (0.231)	-0.539 (0.503)	0.330* (0.196)	-0.468** (0.225)
G X DM	0.625+ (0.340)	-0.740 (3.115)	-1.900 (2.788)	0.264 (0.170)	1.167+ (0.598)	0.076 (0.117)	1.031*** (0.218)
G^2 X DM		0.348 (0.885)	0.622 (0.790)		-0.287+ (0.152)		-0.235*** (0.048)
% of Upper Tier Seats	-0.022 (0.058)	0.132 (0.202)	0.141 (0.179)	-0.057+ (0.033)	0.101 (0.087)	0.048*** (0.016)	0.002 (0.028)
G X % of Upper Tier Seats	0.013 (0.039)	-0.166 (0.253)	-0.176 (0.224)	0.059*** (0.021)	-0.136 (0.097)	-0.016** (0.008)	0.013 (0.025)
G^2 X % of Upper Tier Seats		0.048 (0.076)	0.051 (0.067)		0.054** (0.024)		0.005 (0.004)

Table 5 continued

	(Model 1) 1990s	(Model 2) 1990s Quadratic	(Model 3) 1990s Quadratic/ No Italy	(Model 4) Pooled/ Established Democracies	(Model 5) Pooled/ Established Democracies with Quad.	(Model 6) Pooled	(Model 7) Pooled with Quadratic
Eff. # of Pres. Candidates	0.067 (0.216)	0.119 (0.221)	0.221 (0.199)	0.264+ (0.146)	0.251+ (0.148)	0.345** (0.165)	0.317*** (0.069)
Proximity of Pres. Election	-4.950*** (1.239)	-4.768*** (1.301)	-4.568*** (1.154)	-3.098*** (0.461)	-2.962*** (0.463)	-3.418*** (0.552)	-3.343*** (0.365)
# of Presidential Cands. X Proximity	1.423*** (0.435)	1.314*** (0.462)	1.165*** (0.413)	0.683*** (0.230)	0.663*** (0.234)	0.800*** (0.231)	0.735*** (0.144)
Constant	5.152*** (1.325)	-1.630 (5.243)	-5.179 (4.802)	2.916*** (0.347)	2.345*** (0.423)	2.811*** (0.340)	2.377*** (0.286)
Observations	39	39	38	487	487	555	555
R^2	0.482	0.526	0.620	0.397	0.419	0.299	0.361
Adjusted R^2	0.344	0.333	0.460	0.387	0.405	0.289	0.348

Notes:
- Standard errors in parentheses. $+ p < .1$, $* p < .05$, $** p < .01$
- Dependent variable: National-level effective number of electoral parties
- G = National-level effective number of ethnic groups
- G^2 = G-squared
- Models 1-3 are OLS. Models 4-7 pool the data set for all years and use OLS, but employ robust standard errors clustered by country.

Figure 1. Scatterplots of district-level social diversity and party fragmentation (with regression line from results in Table 3)
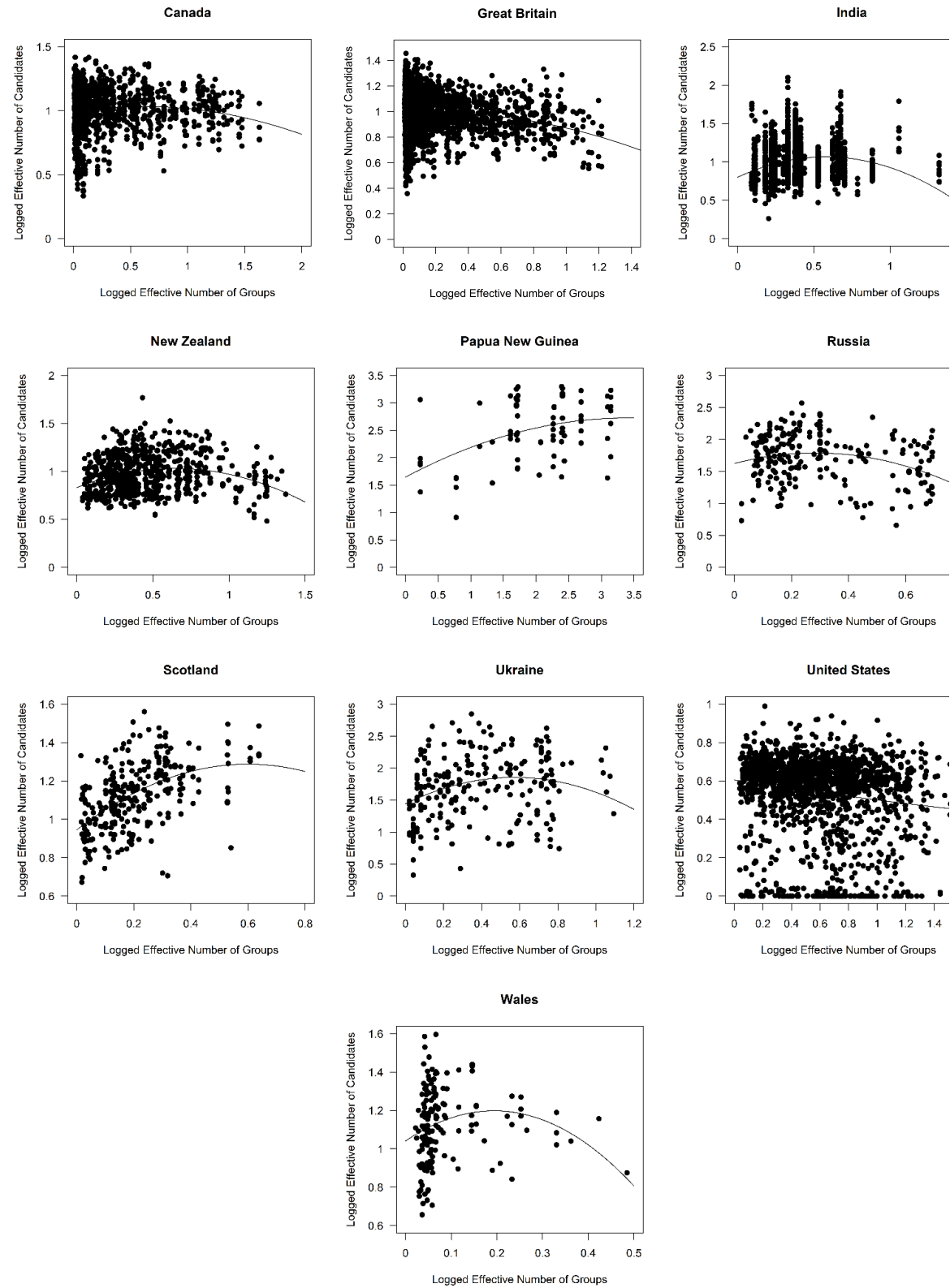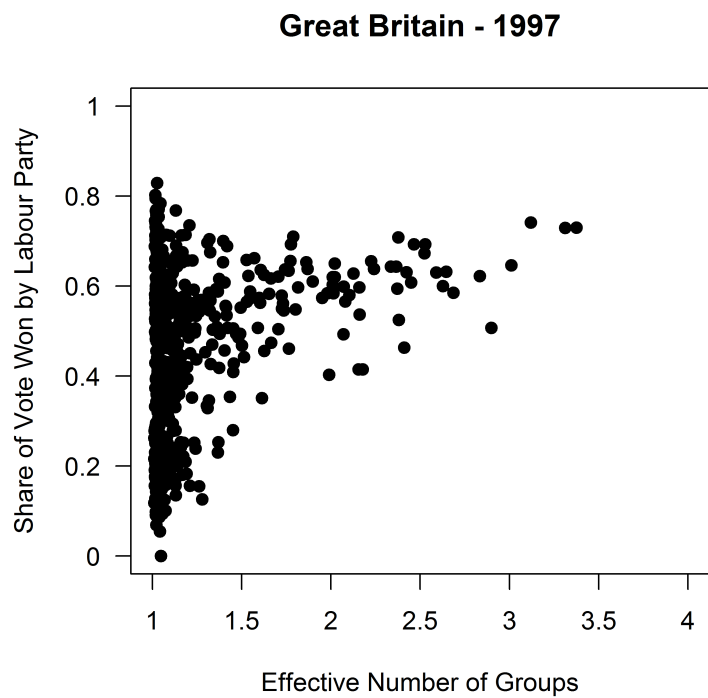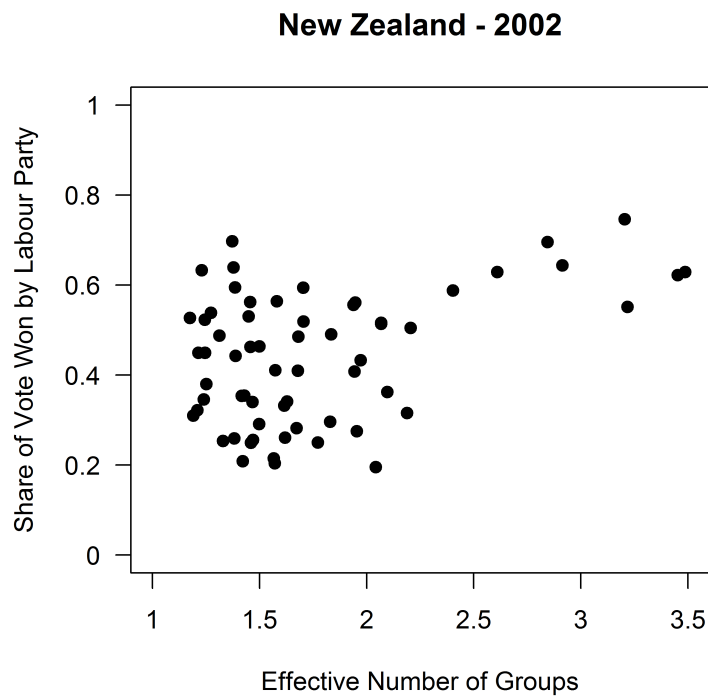
Figure 2: Ethnic Diversity and the Labour Party's Share of the District Vote

New Zealand - 2002

Great Britain - 1997

Appendix: Sources of Subnational Census Data

Country/Region	Year of Census	Data Source
Canada	2006	Statistics Canada (www.statcan.gc.ca)
Great Britain	2001	Office for National Statistics (http://neighbourhood.statistics.gov.uk)
India	2001	Banthia, Jayant Kumar. 2004. *Census of India 2001 The First Report on Religion Data.* New Delhi: Census of India.
New Zealand	1986, 1991, 1996, 2001, 2006	Statistics New Zealand (www.stats.govt.nz)
Papua New Guinea	n/a	Nekitel, Otto. 1998. "Voices of Yesterday, Today and Tomorrow: Language, Culture and Identity." New Delhi: UBS Publishers.
Russia	2002	Collected by one of the authors from data provided by the Russian Census Bureau.
Scotland	2001, 2011	Scotland's Census Results Online (http://www.scrol.gov.uk)
Ukraine	2001	Collected by one of the authors from data provided by the Ukrainian Census Bureau.
United States	2000, 2010	U.S Census Bureau (http://www.census.gov/main/www/cen2000.html)
Wales	2001	Office for National Statistics (http://www.statistics.gov.uk)