Contextual effects and other influences: using multilevel modelling to study the extent and causes of spatial variations in post-war Australian federal voting

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Introduction

The statistical techniques of multilevel modelling have been developed since the early 1980s as researchers in various fields have recognised the importance of accounting for the effects of data structures that are composed of different levels of units of analysis. These levels are usually hierarchically structured and it is this structure that most multilevel methods attempt to model[1]. In the area of political science, an example is individual voters, located within constituencies, located in turn within regions such as states. An example from educational research is individual school students, grouped into classes, which in turn occur within schools, and one from demography is individual families or households, located within villages, located in turn within some sort of larger geographic regions such as provinces. If data are available for each of the levels in these structures, then the effects at various levels can be studied simultaneously using multilevel models.

While the use of multilevel models for data structures like these is sometimes motivated by technical statistical considerations[2], the models are naturally of most interest when there are substantive reasons for believing that individual behaviour or attitudes might be linked to the group context. In the voting example mentioned above, an incumbency advantage at the constituency level would be such an effect, as would a contextual effect of the social class composition of an area.

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[1] Most authors, in fact, use the term 'multilevel' to refer specifically to hierarchical data, although some kinds of non-hierarchically structured data can also be analysed by multilevel methods (see, for example, Goldstein 2003 or Hox 2002 for details).

[2] This is since some of the standard statistical formulas used for testing for significant effects are not valid when data clustering is present (for example, see Skinner et al 1989) and incorrect conclusions can be reached if this is not allowed for.

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In the electoral setting, the inclusion of constituency level variables in addition to individual level ones allows contextual effects at the constituency level to be investigated without them being confounded with corresponding compositional differences at the individual level. As an example, without this we could not be sure that if we found a constituency level unemployment effect that favoured one particular party, it did not merely result from individuals who were unemployed being more likely to support that party (rather than it being a contextual effect over and above any individual level effect).

Potentially, in fact, the individual level effect could work in the opposite direction to the corresponding contextual effect, something that could create some interesting policy dilemmas for political parties. Two examples of this in Australia occurred at the 1996 election (Charnock 1997). First, being personally unemployed increased the chances of voting for the Liberal-National coalition whereas, in contrast, the contextual effect of having higher unemployment rates locally was to increase the chances of voting for the ALP. Second, the contextual effect of living in areas with higher proportions of people born in Southeast Asia was to reduce the chances of voting ALP, whereas the individual level effect of not being from a British, European or North American background was to increase the chances of voting for the ALP.

As relatively 'user friendly' computer software for estimating multilevel models has become available, the techniques have become more widely used and there are now several expository texts, requiring different levels of statistical and mathematical background (in descending order of difficulty the main ones are Goldstein 2003; Raudenbush and Bryk 2002; Snijders and Bosker 1999; Hox 2002; Kreft and De Leeuw 1998). The earliest application in the area of voting behaviour that I am aware of was to British voting (Jones et al 1992) and similar methods were subsequently applied to

studies of Australian federal voting at the 1993 and 1996 House of Representatives elections (Charnock 1994a, 1996, 1997).

To date, almost all published multilevel research in the area of politics has been concerned with studying effects at different levels defined geographically (Andersen and Heath 2002; Charnock 1996, 1997; Fisher 2000; Heath et al 1996; Jones et al 1992). However, the potential range of applications is broader than this and I would recommend the very clear discussion in Steenbergen and Jones (2002) to interested readers. Several of the individual chapters in Franklin and Wlezien (2002) address related issues involving contextual effects and the linkage of micro- and macro-level phenomena, and it is clear that the study of multilevel data structures will play an increasingly large role in political science.

In the area of electoral studies, most applications of multilevel modelling methods have involved studies of single elections (Andersen and Heath 2002 and Heath et al 1996 are notable exceptions in the British context). Although these have provided some valuable conclusions that could not have been drawn reliably from the more common single-level analyses, it is difficult to know from studies of single elections how many of the findings are specifically related to the circumstances of those elections.

In this paper I will present results from an extensive survey-based study of post-WWII federal elections for the Australian House of Representatives and discuss the conclusions that can be drawn from the multilevel analyses. Basing this study on a long series of elections allows variations over time to be studied and related to social trends or political events. My focus throughout will be on situations where the various levels in the multilevel data structure are defined geographically (with up to

three levels: individual voters, electoral divisions and states, although not all will be used in any particular analysis).

Data and Methods

The minimal requirement for carrying out these sort of analyses is that data must be available that identifies the geographic areas in which each of the individual sample respondents is located. However, there are no publicly available survey data that allow the most extensive analyses for the entire post-war period. The geographic identifiers included in the early Morgan Gallup Poll data sets are more limited than those in later surveys. In particular, while they identify the state of residence, they do not include an identifier for electoral divisions. However, many do include one for the 'political complexion' of the electoral division that can be used to construct a reasonably detailed alternative that is useful for some purposes.

The presence of geographic identifiers is enough to allow certain sorts of problems to be studied by multilevel methods, but by itself is not sufficient for studying the nature of contextual effects in detail. For this, we also require data on the characteristics of the 'contexts'. Although it would sometimes be possible to gather such information at the same time as that of individual respondents, this is almost never done in practice and the main data sources used in levels defined geographically are population censuses, which generally provide information on a range of social, economic and demographic aspects. In most countries such censuses are held every 10 years (and so the data can sometimes be quite distant from elections), but Australian ones have been held every 5 years since 1961. However, census data availability at the level of electoral divisions is more recent, and

geographic identifiers that allow survey data to be linked to census data at that level are only available from the 1971 census onwards[3].

Having to base analyses on census data for electoral divisions is not an ideal way of measuring relevant features of the local social environment[4]. However, as observed by Andersen and Heath (2002: 127), although "…constituency is not an intimate level of community…it should still allow us to tap some of the effects of social milieu." Furthermore, it probably gives an underestimate of the size of contextual effects because "…[i]t is likely that a more localized measure of community would show stronger contextual effects."

In order to be consistent throughout the period under study, only ALP and Liberal-National/Country Party coalition voters are included. Because of the changing nature over the post-war period of the significant minor parties and the small numbers of survey respondents voting for them, this is the approach generally adopted in studies of Australian voting and with only a few exceptions (mainly since 1990) includes over 90 per cent of voters. Analytical techniques used are all based on logistic regressions for ALP vote v Liberal-National (Country) Party coalition vote, and multilevel estimation was carried out using the MLwiN program (Rasbash et al 2000)[5].

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[3] The practical impact of this is not large, since it was only in Aitkin's 1967 survey (with a second wave in 1969) that data on electoral division first began to be recorded. The National Social Science Surveys began in 1984 and the series of Australian Election Studies commenced in 1987. The gaps can be reasonably covered by using data for Age Polls.

[4] There are also some potential contextual effects that relate directly to the electoral division, such as the popularity of local candidates, but there is no corresponding data available.

[5] All results presented here are derived from random intercept models. Several findings are presented in terms of a pseudo r-squared measure that represents the percentage of variance in ALP voting at different

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Results

The relative importance for voting of influences at different geographic levels

Studying this question was the main rationale for the original Jones et al (1992) article that used multilevel analysis methods to study voting in Britain, and they found quite large effects at both the constituency and the regional level. There are, of course, various possible explanations for such observed effects, including the existence of both social compositional variations and contextual effects. These can be explored if suitable data are available and this is an aspect I will return to later.

In the case of Australia, the presence of a federal system of government has meant that much of the debate on the topic of geographic variations has been focussed on the size and importance of state-level variations. However, multilevel analysis has been used previously to show quite conclusively that throughout the post-war period such state-level variations have been consistently very small (see Figure 1).

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levels and explained (or, by subtraction, unexplained) by the various models. The measure is described by Snijders and Bosker (1999) and is the multilevel analogue of the measure that DeMaris (2002) indicates is the best one for bivariate logistic regressions.

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Figure 1: State level variation in ALP voting 1946-1998
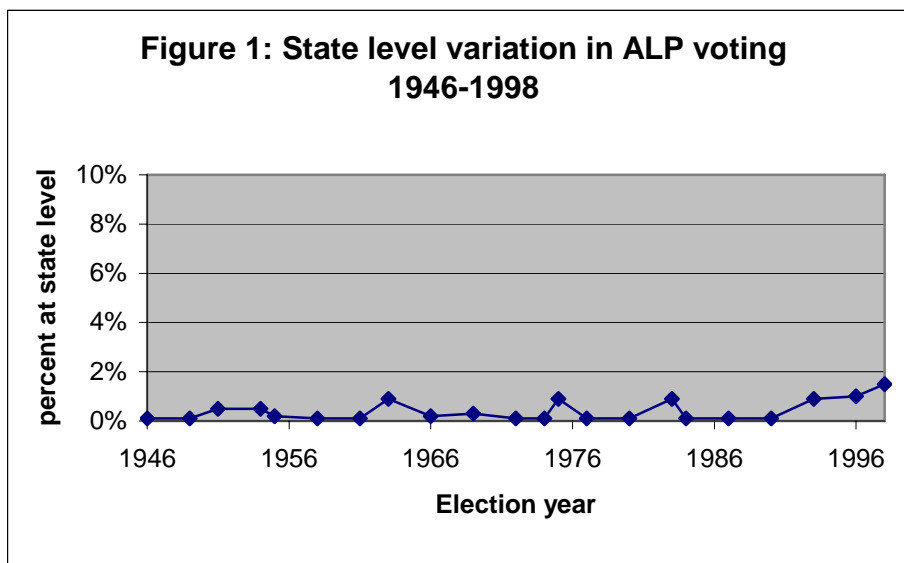
Note: quantities plotted are the percentages of total variance that are located at the state level in two level logistic regression null models for ALP voting, with individuals as level 1 and states as level 2. **Source:** Charnock (2003).

Evidence in Charnock (2003) indicates that institutional factors related to the federal structure play a large part in explaining this fact. The main argument is that the relative representation entitlements of the small number of states (six) are such that neither major political party could afford to let state-level variations be anything other than small, otherwise they could not expect to win a majority of seats[6]. This situation is quite different from that prevailing in either the USA (with its much larger number of states) or in Britain, with its much less formally organised sub-national political structure, and this helps to explain why regional variations in those countries are larger than in Australia.

At a more local level than that of regions or states, one of the findings of Andersen and Heath (2002) in their multilevel study of the significance of contextual social class in the period from 1964 to 1997 in Britain was that constituency-level variances

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[6] The relatively similar socio-demographic structures of the states are a further significant aspect

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for Labour voting in the second half of that period were generally considerably higher than in the first half, something they associated with political factors. The Australian equivalent is the level of electoral divisions, but here there is no corresponding pattern of an increase in the second half of the period (see Figure 2).
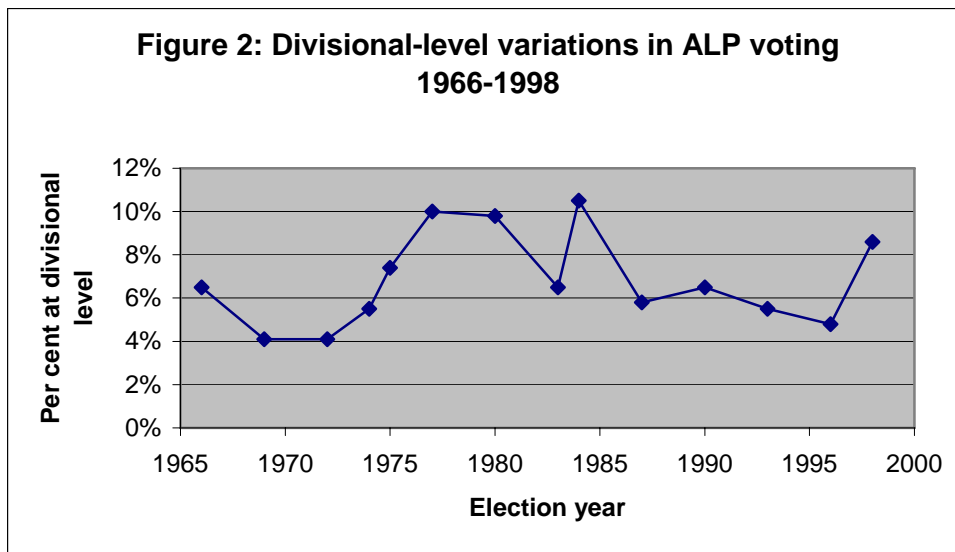
Figure 2: Divisional-level variations in ALP voting 1966-1998

Note: quantities plotted are the percentages of total variance that are located at the divisional level in two level logistic regression null models for ALP voting, with individuals as level 1 and divisions as level 2.

Nevertheless, the pattern of fluctuations over time is one that is strongly associated with political factors: at periods around the appearance in the party system of a significant new minor party, divisional-level variation becomes more important. This is apparent at the elections following the formations of both the Australian Democrats (1977) and the One Nation Party (1998).

As mentioned previously, although separate divisional identifiers are not available for the earlier Gallup Polls, further confirmation of the impact of political factors can be obtained by making use of a divisional 'political complexion' variable for the

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earlier period[7]. Analyses (not shown here) based on a level derived from this variable show a similar pattern to that of Figure 2, with a noticeable increase in the importance of this more localised variation at the 1958 election (the election following the formation of the Democratic Labor Party).

This relationship to the advent of new parties is readily understandable, because either a new party would not draw support from the ALP and Coalition in a geographically uniform manner at the divisional level, or else may not run candidates in all divisions. However, the major parties clearly adapt very quickly, because at other times the unexplained divisional-level component is generally relatively small (though still considerably larger than that at the state level). The main exception to this pattern occurred at the 1984 election, but it is probable that this can also be attributed to political factors. This was the first election after the size of the House of Representatives was expanded from 125 to 148 members and many of the new divisional boundaries were finalised only very close to the election date, with resulting disruptions to local party organization.

As mentioned above, Andersen and Heath (2002) argue that political factors in Britain help to explain the increase over time they found in the constituency-level variance for Labour voting, linking it to changes in the policies and candidate nomination patterns of the Liberal Party and the Liberal Democrats. However, the presence of neither the DLP nor the Australian Democrats had similar consequences in Australia. Given that the two countries have gone through many similar social and economic changes, this suggests to me that the different institutional framework (particularly compulsory and exhaustive preferential voting and the existence of two,

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[7] The resulting aggregations of divisions with similar political complexions contain an average of about three electoral divisions and so are not directly comparable with the later analyses based on individual divisions.

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almost equally powerful, legislative chambers with different electoral systems) must again be considered to be a powerful mediating influence.

For some additional evidence about this, we can turn to Leithner's (1997) analyses of aggregate voting data. While these do not examine individual elections, they do show quite consistent levels of divisional-level variation decade by decade from the 1960s to the 1980s for Australia. For the USA, on the other hand, he finds a sharp increase in the constituency component over that period and, following Kawato (1987), attributes this mainly to increasing levels of partisan dealignment (leading to an increase in the importance of local candidates).

In contrast, the extent of partisan dealignment in Australia has been comparatively small (see McAllister 1997, for example). Among the strongest explanations that have been offered for this are institutional ones, again relating to the existence of compulsory voting and exhaustive preferential voting. Therefore, Leithner's work also supports (albeit through an indirect route) the argument that the institutional framework plays an important role in changes in the size of the divisional level component. He also finds that the divisional-level variance component in Australia is much larger than the state-level one and this is consistent with my findings.

Although fairly small except at times of disruptions to the party system, divisional-level variations are nevertheless several times larger than those at the state level and it is important to understand the factors underlying those divisional variations that are present. Social compositional differences between divisions are usually thought to offer the main explanation. Indeed, although this is not a common view, it has been argued by King (1996) that the differential distribution of individual level characteristics should be the only explanation to be considered.
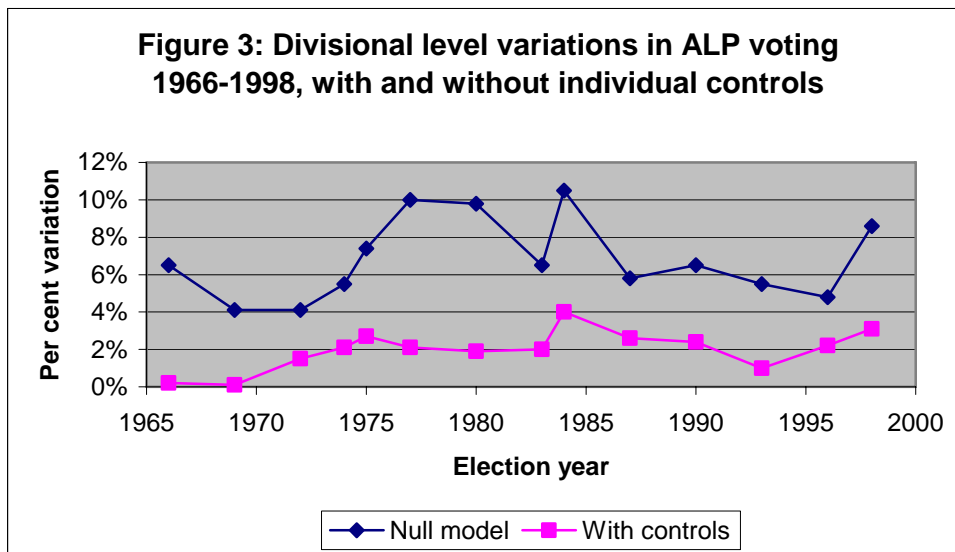
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In this case, over the period 1966 to 1998, models that control for some important individual-level socio-demographic characteristics account for over 70 per cent of the divisional-level variations on average. Figure 3 shows the residual divisional-level variation that remains after such compositional differences are controlled for. The fluctuations over time apparent there are very significant, because the above-mentioned overall average conceals a very interesting difference between periods of ALP government and periods of Coalition government. In the former, the proportion of divisional level variation accounted for by these variables tends to be considerably smaller (an average of just over 60 per cent) than in the latter (an average of over 80 per cent).

This provides strong support for the contention that one impact of changes to social structure has been to make it very difficult for the ALP (unlike the coalition) to hold government without weakening its social structural base. Very revealingly, there was only a single election among those won by the ALP where the social compositional variables explained over 70 per cent of the divisional level variation. That was the 1993 election, which was fought mainly over the radical and polarising policies in the coalition's *Fightback!* package[8].

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[8] The coalition parties based their campaign around an extensive set of radical policies, detailed in a package known as *Fightback!* These included extensive taxation reform and other major changes to the industrial relations system and to Medicare (the universal health insurance and hospital treatment scheme). Another interesting tactical aspect of the 1993 election is that, by attracting extra support from its more traditional social structural base, the ALP reverted to the situation that had prevailed prior to the electoral system changes of 1983-4, a position in which it was disadvantaged by the spatial over-concentration of its vote (see Charnock 1994b: 487).

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Figure 3: Divisional level variations in ALP voting 1966-1998, with and without individual controls

Note: quantities plotted are the percentages of total variance that are located at the divisional level in two level logistic regression models for ALP voting, with individuals as level 1 and divisions as level 2. Individual level variables controlled for are age, sex, labour force status, social class, occupation, religious denomination, religious attendance, state of residence and country of birth.

As well as being due to differing social compositions, another possible source of divisional-level variation are contextual effects. All of Jones et al (1992), Fisher (2000) and Andersen and Heath (2002) conclude from their multilevel analyses that contextual effects have a significant effect on voting in Britain. Jones et al (1992) studied the influence of local context on voting at the 1987 election, as measured by local unemployment rates and changes in these and also by the extent of the workforce in the mining industry, and found significant effects for the first two of these variables, which they interpreted as reflecting local economic prosperity. Fisher (2000) studied the 1983 election and found that both local unemployment rates and contextual occupational class composition had significant effects. Andersen and Heath (2002) show that contextual social class (as measured by Goldthorpe's occupational class schema) had a significant effect throughout the period from 1964 to 1997 and that there had been little change in the size of the effect during the period.
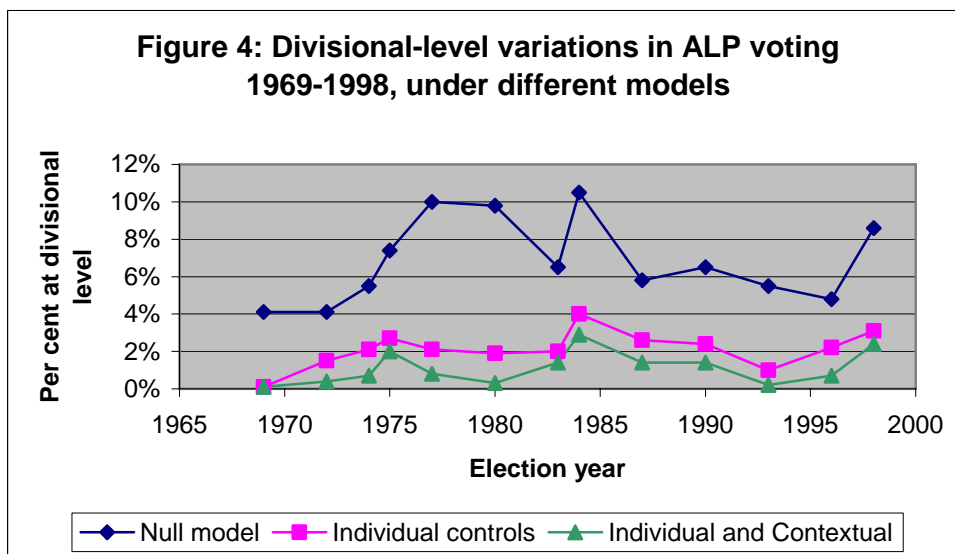
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For Australia, a number of possible contextual factors for the 1993 and 1996 elections were investigated in Charnock (1996, 1997). Significant effects for all of local unemployment rates, rurality and local ethnic context were found at both elections, and the inclusion of these variables noticeably reduced the amount of divisional level variation that remained unexplained.

	TABLE 1: Divisional-level Census variables included
DIVUNEMP	Divisional unemployment rate (%)
DIVAGRFF	Divisional % employed in Agriculture, Fishing and Forestry
DIVOSEAS	Divisional % born overseas
DIVMOBIL	Divisional mobility rate (% resident in different address from 5 years earlier)
DIV2PARS	Divisional % of families with two parents and offspring

Figure 4 shows the result of extending this to cover the period from 1969 to 1998 (roughly comparable to that studied for Britain by Andersen and Heath). The incorporation of divisional level variables (see Table 1) in addition to the individual level ones generally explains a substantial proportion of the remaining divisional level variation (about half of it, on average). These final, most extensive models have very small amounts of unexplained variation at the divisional-level, seldom being over 2 per cent and averaging only 1 per cent. Moreover, there is no consistent upward or downward trend over the period.

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Figure 4: Divisional-level variations in ALP voting 1969-1998, under different models

Note: quantities plotted are the percentages of total variance that are located at the divisional level in two level logistic regression models for ALP voting, with individuals as level 1 and divisions as level 2. Individual level variables controlled for are age, sex, labour force status, social class, occupation, religious denomination, religious attendance, state of residence and country of birth. Divisional level variables controlled for are listed in Table 1.

Changes over time in the significance of individual factors

As mentioned in note 2, when underlying data structures are multilevel in nature but this aspect is not taken into account in the estimation process the standard formulas for assessing significance of variables are inappropriate. The most likely effect of nevertheless using these formulas to assess significance is that 'false positives' will be found i.e. some variables will incorrectly be identified as significant.

Because of this, it is possible in principle that some of the previous conclusions drawn by researchers about influential individual level factors might require modification. However, previous uses of multilevel techniques with Australian voting data have not shown a large difference in this respect (Charnock 1996, 1997), with the significant effects identified being very similar to those previously identified by other authors (e.g. McAllister 1992) using traditional analytical methods.

Consequently, since a good deal is already known about changes in individual level factors over time, I will focus here instead on a detailed discussion of how the sizes of divisional level contextual effects varied between 1969 and 1998. As in previous analyses of the 1993 and 1996 elections, the divisional-level variables investigated (see Table 1) related to the urban-rural cleavage, and to aspects of the socio-economic, family and ethnic structure of the divisions[9].

The main previous findings about divisional-level variables were that both the unemployment rate and the proportion engaged in agriculture, fishing and forestry had significant effects at both the 1993 and 1996 elections, while the proportion born overseas had a significant effect at the 1993 election only[10]. Other variables were not significant. The respective directions of the effects were as follows: higher unemployment rates were associated with increased odds of voting for the ALP, while higher values of the two other variables were both associated with decreased odds of voting ALP.

These findings were readily explainable and consistent with widely held beliefs, and one might have expected that they would have held true fairly consistently during the longer period from 1969 to 1998. This is not the case, however, with the results in Table 2 showing some noticeable changes over time. Of the variables that were significant in 1993 and 1996, the unemployment rate was also significant very consistently from 1980 onwards (but only once earlier), with higher rates always favouring the ALP. The 'countrymindedness' contextual effect (as measured by

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[9] Elections from 1969 to 1975 were linked to 1971 census data; the 1977 election to the 1976 census; the 1980 and 1983 elections to the 1981 census; the elections from 1984 to 1990 to the 1986 census; the 1993 election to the 1991 census; and the 1996 and 1998 elections to the 1996 census.

[10] However, a variable measuring only the proportion born in south-east Asia was significant at both elections, apparently indicating a specifically anti-Asian effect.

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DIVAGRFF) is now shown as being at its most significant in 1974 and 1975, the last two elections at which Gough Whitlam was ALP Prime Minister. The estimated effect is not quite large enough to be statistically significant in 1984 and 1987, but

TABLE 2: Significance of divisional-level variables 1969-1998

	DIVUNEMP	DIVAGRFF	DIVOSEAS	DIVMOBIL	DIV2PARS
1969	0.47	-0.91	0.29	-2.06*	
1972	0.60	-1.57	0.20	-1.80*	
1974	1.30	-3.37**	-2.09*	-1.93*	
1975	1.84*	-4.63**	0.32	-2.27*	
1977	1.20	-0.41	2.87**	-2.67**	2.50**
1980	3.38**	-0.64	2.90**	-2.06*	2.76**
1983	2.58**	-1.01	0.54	-1.86*	1.27
1984	2.86**	-1.58	1.50	-0.54	0.79
1987	1.51	-1.63	0.75	-2.01*	0.64
1990	3.28**	-0.26	0.40	-0.98	0.54
1993	5.45**	-1.95*	-1.98*	-1.07	1.30
1996	2.46**	-2.45**	-0.50	0.49	0.47
1998	2.53**	-0.28	-0.02	0.05	-0.22

Note: * significant at 5% level (one-sided test)   ** significant at 1% level (one-sided test)
Entries in the table are t-values (estimated coefficients divided by their standard errors). Estimates are based on two-level logistic regression models as specified in Figure 4.

was significant in both 1993 and 1996. In all cases, higher rurality favours the Coalition. The overseas-born effect is only intermittently significant (1974/77/80/93) and its direction is not consistent, favouring the ALP and the coalition on two occasions each.

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The two variables that were not significant in 1993 and 1996 were, though, influential at earlier times. The pattern for the effects of the residential mobility rate shows it was significant at almost every election up to 1987 (higher mobility consistently favouring the Coalition), but not significant thereafter. Finally, the 'traditional family structure' variable (DIV2PARS) is significant in 1977 and 1980 (higher values favouring the ALP) but not thereafter. Unfortunately, data on this was not available for linking to elections earlier than 1977 and so we cannot know whether there was a consistent theme that ended in 1980 or whether 1977 and 1980 were unusual in some way.

Discussion

In attempting to understand these Australian findings, it will be necessary to draw on institutional features, contemporary political events and changing social and economic factors. If international comparisons were possible, they should be able to offer some useful insights, but there is a paucity of comparable research on other countries and only some comparisons with Britain are available at present.

The federal political structure of the Commonwealth of Australia inevitably places the states in a special position. The main political parties are organised on federal lines and essentially the same parties are involved in contesting federal and state elections. The conflicts between state and federal governments over finance and their respective powers have also made the interplay of state and federal election issues and voting a matter of debate, of historically varying degrees of vigour. State variations in federal voting are therefore a matter of some importance, and are quite a popular theme of comment for both academics and journalists.

However, the results of these multilevel analyses demonstrate quite conclusively that the overall levels of variation attributable to the state level are relatively very small,

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and have been so throughout the post-war period. Institutional factors go a long way towards explaining this finding, with the respective representation entitlements of the states in the House of Representatives forcing the main political parties to work to avoid large or ongoing variations at the state level (Charnock 2003). In respect of one of the most frequently argued reasons as to why there should be an observed state-level effect on federal voting, Bean (2003: 473) used data from the 2001 election to study the hypothesis that state leaders may influence federal voting and concluded that his results '…generally tend not to support the hypothesis.'

Unfortunately, there is no directly comparable published series of multilevel analyses for other countries, so a directly comparative approach is not possible. However, the single election multilevel studies of British voting in Jones et al (1992) and Fisher (2000) both suggest that regional variations in Britain are considerably larger (even after controlling for some individual-level social characteristics) than the Australian state-level ones and this is certainly what would be expected from the institutional argument. Using different techniques, based on analyses of aggregate votes, Leithner (1997) demonstrates that by the 1980s the state-level variance components in both Australia and the USA were very small but that, whereas this had been true for all of the post-war period in Australia, there had been a large drop over the post-war period in the USA. The finding of only small changes over time in Australia is also consistent with the institutional argument above.

All of these results, therefore, support the argument that Australia's unusual institutional framework plays an important role in keeping the extent of state level components small.

As far as understanding the factors underlying divisional-level variation is concerned, the most obvious place to begin is to assess the extent to which it results from the spatially heterogeneous distribution of some of the important socio-

economic and demographic individual attributes that are known to be related to voting behaviour. Many of these are also influential in determining residential location at a quite local scale and when a group of these attributes is controlled for, less than 30 per cent of the divisional-level variation on average remains unaccounted for[11].

The addition of some divisional level factors reduces the unexplained divisional-level variation even further (on average to below 15 per cent of its original size in the null model) and it is clear that the overall extent of the influence of other local factors (such as popularity of local candidates and incumbency effects) cannot have been large at most elections. Of course, it could still have been important in some particular divisional contests, and could also have been practically significant because of the small margins present in a large proportion of divisions. However, there is no prospect of finding local incumbency effects of the magnitude apparent in the USA. Again, this is influenced by the use of a parliamentary system in Australia which, along with aspects such as compulsory voting, helps maintain a significant degree of partisan alignment.

The nature of the significant divisional level effects is very interesting, and in some instances a little surprising. The most consistently significant is the local unemployment rate; with the sole exception of 1987, this is significant from 1980 onwards. At first glance, this might seem inconsistent with the fact that the aggregate relationship between vote and unemployment rate at a national level is very weak in Australia (Jackman 1995; Charnock 1995). However, it is consistent with research in Britain that makes use of direct evaluations of economic conditions at different levels,

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[11] This is rather less than in Andersen and Heath's (2002) British analyses, but drawing reliable conclusions from this comparison is not possible, because my analyses control for more individual factors than do theirs.

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and shows that voters' economic evaluations at both personal and regional levels are significant influences on vote (Pattie and Johnston 1995).

The question of how to interpret the significance of local unemployment rates is not, however, completely straightforward. Previously it has generally been regarded (e.g. Fisher 2000; Jones et al 1992) as an indicator of local economic prosperity. However, the fact that its effect in Australia has always favoured the ALP (irrespective of whether the ALP was in government or opposition) immediately rules out the possibility that its influence operates through higher unemployment rates leading to voter antagonism towards the incumbent governing party.

There are, I think, two plausible alternative explanations of the finding. They are not independent of each other and it is not possible with the available data to conclusively choose between them. The first takes the unemployment rate as being an indicator of local economic prosperity and argues that the reason for higher unemployment rates favouring the ALP is that the ALP has been a much stronger supporter of welfare benefits and state intervention generally than have the coalition parties. The fact that the largest effect for this variable was in 1993, despite this being the election at which unemployment was at a post-war election high of 11 per cent and the ALP had been in office for a decade, provides support for this interpretation (also see note 8)**.**

Placing a significant emphasis on contextual social class is often done in studies of British voting. Most recently, Andersen and Heath (2002: 125) have concluded that the importance of contextual social class (at the constituency level) over the period 1964-97 in Britain has been '…consistently significant and fairly constant throughout the period.' This type of argument suggests a second possible explanation for the significance of local unemployment rates, one that focuses on understanding the

results in terms of differences in the social class composition of electoral divisions, with the contextual effect of living in an area with higher proportions of working class residents being to increase the chances of voting ALP.

This explanation obviously assumes the existence of quite strong relationships between social class composition and unemployment rates. For Australia, the Goldthorpe contextual class schema based on occupation used by Andersen and Heath cannot be replicated for the full period. However, from the mid-1970s until the mid-1980s, the ecological correlations between divisional unemployment rates and occupational structure variables that are somewhat similar to some of the extremes of the Goldthorpe schema were generally in the range from 0.3 to 0.4. In later years these correlations were larger (0.5 to 0.6).

In the earlier part of the period, on the other hand, when unemployment rates were very low (until the mid-1970s) there was very little correlation between unemployment rates and occupational structure at the level of electoral divisions. However, since this also corresponds with a period when the divisional unemployment rate was not significant, this is not evidence against the contextual social class interpretation. Overall, then, the evidence is fairly consistent with both interpretations of the significant divisional level effect of unemployment and, indeed, I think a fuller understanding is probably to be obtained by incorporating both.

Perhaps the main surprise in the pattern of contextual effects that was discovered here is the finding that a 'countrymindedness' effect favouring the Coalition (indicated by the presence of significant effects for DIVAGRFF) appears only intermittently. The continued existence of the National Party can perhaps be taken as evidence that a rurality effect does exist, but that it is often manifested in this

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institutional manner, rather than always reflected in the overall ALP v Coalition contest.

However, the exceptions to this are, I believe, very revealing. They occur in two periods, each consisting of two consecutive elections (1974/1975 and 1993/1996). The most immediately convincing explanation is that policies and/or personalities of ALP governments have led to this effect being activated. Ultimately, the large defeats of the Whitlam and Keating governments both coincided with this effect being at its highest point in the respective periods.

It is possible that one can take this argument somewhat further and suggest that since it was the Hawke elections as Prime Minister that showed the weakest corresponding estimated effects (none are quite statistically significant) during periods of ALP government, an ALP government led by a Prime Minister with strong centralising tendencies (Whitlam and Keating: coincidentally (?) also both from Sydney) has been a recipe for eventual serious failure, associated with bringing this contextual effect into play strongly. If so, there is a cautionary tale here for the ALP.

The fact that the overseas-born effect was inconsistent in direction and only sporadically significant is probably unsurprising, given the large changes that have occurred over the period in the balance of source countries for immigrants. In the mid-1960s, a common pattern was for over half of arriving settlers to be from the UK or Ireland, with about another quarter being from Southern Europe and very few from Asia. By the late 1980s and early 1990s this had radically altered to around 40-50 per cent being from Asia and below 20 per cent from the UK and Ireland.

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To capture any corresponding contextual effects, this means it would probably be necessary to use more regionally defined measures of ethnic composition than was possible here and, moreover, to use different ones at different times. McAllister and Kelley (1983), for example, found it necessary to use three such measures, all of which at that time were related to Europe and the Middle East. Because of the lengthy period covered in this study, it was not practical to do this here, although earlier research (Charnock 1997) did find what appeared to be an anti-Asian contextual effect at both of the 1993 and 1996 elections, which could be seen as a precursor to the foundation of ONP. The effect was not present in the ALP v Coalition contest in 1998, something that could plausibly be associated with the advent of ONP.

The fact that the effect of higher residential mobility rates at a divisional level consistently worked against the ALP until 1987, but was thereafter non-significant, is very interesting because it is relevant to some previous debates about historical voting behaviour. Kemp (1978: chapter 4) argued for the existence of a politically conservative 'suburban effect' and suggested that this might be a contextual effect. My results here are certainly consistent with this, because many studies of urban residential differentiation (see, for example, Logan et al 1975) showed that higher residential mobility at the time was associated with suburbanization. However, since lack of data meant it was not possible to include an individual-level variable for residential mobility in my analyses, it is also possible that some or all of the effect results from compositional differences at the individual level.

Kemp himself confuses the two types of effect at times e.g. "…the new suburbs are disproportionately populated by voters who see themselves as being upwardly mobile socially" (Kemp 1978: 125). This is an argument in favour of an effect arising from compositional differences at the individual level, not for a contextual effect.

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One argument that is more properly directed at the role of the social context would suggest that the association of higher residential mobility with more diffuse social networks (which would have been accentuated at times of extensive suburbanization) would mean that the effect of local social milieu would be different from that of more stable communities, but that this might be more significant for the working class than for the middle class (whose social networks already tended to be more diffuse).

In Britain, Andersen and Heath (2002) do in fact find that the effect of contextual social class on voting Conservative was stronger for manual workers than for non-manual ones until the late 1970s. Although the existence of a fairly significant third party in Britain is a complicating factor, I think the similarities between the two countries makes it reasonable to suggest that the same sort of effect would probably have been present in Australia also. Changes in the strength of the relationship between class and vote (see Goot 1994; Weakliem and Western 1999) and in the nature of support for the ALP as it modified many of its policies (see Jaensch 1989) could explain why this effect became non-significant after the mid-1980s.

The friendship networks and associations that develop through children and schools offer prima facie evidence that significance of the 'traditional family structure' variable (DIV2PARS) could indicate the existence of a contextual effect. However, as with the residential mobility rate, no equivalent individual level data is available and so we cannot be sure whether an observed significant effect for DIV2PARS results from individual level compositional differences or from a genuine contextual effect (or both). The unavailability of this variable for the census data before 1976 makes it even harder to interpret the fact that it was significant in 1977 and 1980 and not thereafter, because we do not know if this reflects isolated events or whether it represents the end of a pattern that had been present since the late 1960s or earlier. It

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is possible that it reflects a favourable reaction to the education, health and welfare policies of the ALP under the leadership of Gough Whitlam in the 1970s, especially when contrasted with those that followed under the Coalition government headed by Malcolm Fraser (see Patience and Head 1979, for example). One could speculate that the substantial changes in family structures and fertility rates that have occurred since then would help explain why it was not found to be significant in the last two decades.

Conclusions

This series of multilevel analyses has added considerably to our knowledge of the size, significance and causes of geographic variations in post-war Australian federal voting behaviour. It has conclusively demonstrated that variations attributable to the state level have been consistently very small throughout the post-war period. As has been argued elsewhere with the help of other multilevel analyses, an institutional explanation for this fact is quite convincing. Combined with the recent work on the impact of state and federal party leaders by Clive Bean based on the 2001 election, this suggests that the popular emphasis in commentary on the role of state variations in federal voting is considerably overdone.

Divisional-level variations are much larger than those at the state level, on average by a factor of ten. There has been no trend over time in the size of this component. Rather, its size increases noticeably at periods around the entry into the party system of significant minor parties but decreases again quite quickly. This indicates that the major parties have been flexible enough to succeed in incorporating the elements represented by such minor parties into the pattern of competition between themselves. Following a line of argument proposed by Leithner in the context of aggregate voting studies in the USA and Australia, the lack of a significant increase in the size of this component over the post-war period could be seen to be a

consequence of the much smaller degree of partisan dealignment that has occurred in Australia. A number of the most powerful explanations for this, such as the presence of compulsory, exhaustive preferential voting, involve aspects of the electoral system and so institutional factors also seem to play a significant role here too.

The analyses have allowed me to quantify how much of the divisional level variation can be accounted for by different aspects. The majority is a fairly straightforward reflection of the differential distribution between electoral divisions of long-studied individual level characteristics such as social class and religion. On average for the period from 1969 to 1998 these account for over 70 per cent of the divisional level variation. The fact that they accounted for considerably less during periods of ALP government than they did in periods of Coalition government provides a very good illustration of the difficulties in holding on to government faced by the ALP as it adapted to social and economic changes.

The overall impact of including a small number of relevant divisional level variables in addition to the individual level ones was to significantly further reduce the remaining unexplained proportion of variation at a divisional level (on average by about half). The nature of the divisional effects that were found was partly as expected, but also contained some surprising and very interesting aspects. One of them (the residential mobility rate), whose significance lasted throughout the earlier half of the period, appears to confirm Kemp's argument about the existence of a suburbanization contextual effect (favouring the coalition), although it is not possible to be absolutely sure with the available data that this is the sole correct explanation. The fact that it has not been significant since 1987 can reasonably be attributed to both changing family structures and to modifications to ALP policies.

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The most long-standing (and on-going) divisional effect is for the local unemployment rate. This is one that favours the ALP and is consistent with either of two related interpretations, one as indicating a 'local economic prosperity' effect working indirectly through perceptions of the major parties' stances on government intervention and social welfare provisions, and the other as indicating a contextual social class effect. The second of these would be the equivalent of Andersen and Heath's (2002) argument for the presence in Britain of an on-going contextual effect of social class, but the first interpretation also involves a class element.

The most surprising result is that a significant 'countrymindedness' or rurality effect (favouring the coalition) was found only during periods of ALP government and, moreover, at times when those governments were headed by Prime Ministers with strong centralist tendencies. Eventually it appears to have had very important political consequences, since such periods have concluded with the very large electoral defeats of ALP governments in 1975 and 1996.

Because of the large changes in immigration patterns over the period, the investigation of ethnic contextual effects probably needs to be more sensitive to historical variations than was possible in this project. However, some of the analyses of more recent elections (1993 and 1996) did discover the existence of anti-Asian contextual effects that (at least with the benefit of hindsight) presaged some of the significant political events that followed.

The fact that inclusion of these individual characteristics and contextual effects explains such a large proportion of divisional level variations (over 85 per cent, on average) means that there is relatively little scope for other influences to be of major overall importance. Probably the main such ones that have not been examined here are local incumbency effects and the popularity of local candidates. These are

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probably important in particular electorates, especially in a system that has such a large proportion of fairly marginal seats, but it is not possible to investigate such factors using data from national surveys with sample sizes of around 2000 respondents. However, there has been no trend over the period from 1969 to 1998 in the proportion of divisional level variation unexplained by the complete model used here. This suggests that, unlike in the USA, the overall importance of local candidate effects has not increased in this period. The relatively high levels of party identification in Australia seem to offer an adequate explanation for this.

Only a few international comparisons are available but they are, nevertheless, instructive and some impacts of the 'Washminster mutation' are apparent. The similarities with Britain illustrated by the existence of a major historically class-based party in each country, working within a parliamentary system, result in a significant role in both countries for individual level factors reflecting social structural position, as well as a class-related contextual effect. However, differences in the institutional frameworks also appear to have an impact. The federal nature of the governmental structure is reflected in the structures of the major political parties and this has resulted in a degree of flexibility that contributes to a reduced extent of spatial variations at the level of the states. In both this outcome and in that of reducing the extent of spatial variations at the divisional level, aspects of the electoral system play an important role (through representation entitlements and compulsory voting, respectively).

Although there is debate internationally about the impact of contextual effects on voting behaviour, the evidence found here for the existence of some such effects is very convincing. It is, for example, difficult to think of any other satisfactory explanation for the longstanding significant effect of divisional unemployment rates in addition to the equivalent individual level variable. Although not present as often,

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the same is true for the rurality effect and the ethnicity effect found on occasions. In all these instances, there are revealing and convincing political explanations and/or concomitants. Because of the marginal nature of many Australian electorates, the practical impact of the influence on voting of such effects can be quite significant. If only for this reason, multilevel analyses of influences on voting should become part of standard practice[12], because such divisional level effects cannot be reliably studied otherwise.

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[12] If the level of voting for minor parties remains as high as in 1998 and 2001, it would be advisable (if suitable data are available) to also consider other models (such as multinomial regressions) than the ALP v Coalition ones discussed here.

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