

A NEW METHOD OF PREDICTING VOTING BEHAVIOUR

Janet A. Hoek, Massey University

Philip J. Gendall, Massey University

Janet A. Hoek, Department of Marketing, Massey University, Private Bag 11222 Palmerston North, New Zealand.

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INTRODUCTION

The prediction of voting behaviour interests many political and social scientists and preoccupies most political parties. However, despite several decades of research, the success of attempts to forecast election outcomes has been variable, and, on at least some occasions, has borne little relationship to the actual results.

While researchers agree that undecided voters pose a problem, they have not yet resolved how best to address this problem. Some try to reduce the size of the group by employing a secret ballot methodology (Perry, 1979) while others have used various allocation methods (see Lampert, 1978; Fenwick *et al.*, 1982), and others have adopted the most straightforward, but least methodologically satisfactory, practice of simply excluding the group from any analysis.

Instead of seeking to allocate this problematic group, Gallup devised turnout scales and used these to discriminate between likely and less likely voters. Studies comparing estimates based on the likely voters with those obtained from the total sample suggest the likely voters produce more accurate estimates (Perry, 1973 & 1979). Subsequent work (Traugott & Tucker, 1984; Petrocik, 1991) involved the development of more sophisticated models based on the same principle of discriminating between likely and less likely voters.

In summary, the problem of undecided voters has been dealt with in a variety of ways. Researchers may allocate undecided respondents in the same proportions as those who have made up their minds, or, alternatively, they allocate undecided respondents on the basis of their past voting behaviour. Other approaches seek to identify likely voters and use only their responses in the analysis. However, all approaches rest on assumptions which are, at best, questionable.

First, some approaches assume that undecided voters will vote, or will at least be as likely to vote as those who have made up their minds. Yet if this group is

unlikely to vote, reallocating them may actually decrease the accuracy of voting estimates rather than improve them. Second, these approaches assume that it is possible to establish a clear preference for each voter. This ignores the possibility that, before an election, people may feel an affinity with several parties or candidates - they are genuinely undecided. Allocation methods do not capture this equivocation. A further problem with the allocation method alluded to earlier is that they tend to be complex, making them less accessible to many researchers and thus last resorts rather than first to hand techniques.

What is required is a method which addresses the problem of undecided voters without the problematic assumptions or methodological complexities of existing methods. The remainder of this article describes a method of predicting voting behaviour which meets these criteria. It then discusses the results of a study designed to compare its predictive ability with that of the usual method employed by New Zealand pollsters.

The proposed method for predicting voting behaviour uses the Juster Scale, an eleven point probability scale employed successfully by marketers to predict aggregate consumer behaviour, to estimate both voter turnout and the level of support for each party or candidate.

The Juster Scale

Juster developed the probability scale which bears his name in response to the poor predictive performance of buying intention scales. He observed that many respondents who stated no buying intention accounted for a large proportion of purchases, while only a proportion of those who said they intended to buy actually did so (Juster, 1966). Juster surmised that verbal intentions were really disguised probability statements and suggested that these probabilities could be collected directly using a probability scale. After some experimentation with format and wording, he developed the scale shown in Figure 1, which combines verbal probability descriptions and numeric probabilities.

Multiplying the number of responses for each probability by that probability and dividing the result by the total number of responses gives an estimate of the mean population purchase rate.

Figure 1: The Juster Scale

10	Certain, practically certain	(99 in 100 chance)
9	Almost sure	(9 in 10 chance)
8	Very probable	(8 in 10 chance)
7	Probable	(7 in 10 chance)
6	Good possibility	(6 in 10 chance)
5	Fairly good possibility	(5 in 10 chance)
4	Fair possibility	(4 in 10 chance)
3	Some possibility	(3 in 10 chance)
2	Slight possibility	(2 in 10 chance)
1	Very slight possibility	(1 in 10 chance)
0	No chance, almost no chance	(1 in 100 chance)

Evidence to date suggests the Juster Scale produces more accurate estimates of consumers' behaviour than purchase intention scales. Juster (1966) found that probability data explained twice as much of the variance in actual purchase rates as buying intentions data, and subsequent research has confirmed the Juster Scale's superior predictive ability and cross-cultural applicability (Pickering & Isherwood, 1974; Day *et al.*, 1991; Gendall *et al.*, 1991).

The strength of the Juster Scale lies in its recognition that virtually all self-predictions of future behaviour are conditional; they depend on what happens over the period concerned. By allowing respondents to take this uncertainty into account and express it in their purchase probability, the Juster Scale acknowledges that some individual "non-intenders" will buy and that some individual "intenders" will not. These individual variations are reflected in the aggregate mean purchase probability which is used as a predictor of the population purchase rate.

Although the Juster Scale was developed as a means of predicting purchases of consumer durables, it has also been applied to purchases of other items, including services and fast-moving consumer goods (Gendall *et al.*, 1991), and there is no reason why it should not be applied to any future behaviour with a conditional outcome.

The proposed procedure applies the Juster Scale to the prediction of voting behaviour. The method specifically involves asking respondents their probability of voting for each party or candidate and their likelihood of voting at all. This allows respondents to indicate their relative level of support for all parties or candidates,

rather than requiring them to make an absolute choice. It also explicitly acknowledges that respondents may have different probabilities of voting. In addition, the method recognises that undecided respondents may not be homogeneous, but are likely to comprise at least two groups: those who are undecided because they are uninterested and unlikely to vote, and those who are likely to vote, but who are genuinely undecided about who they will vote for.

Although on election day voters will either vote or not and, if they do vote, they will have to support one candidate or party, the Juster Scale provides estimates of aggregate behaviour which take into account any discrepancies between individuals' projected and actual behaviour.

METHOD

To test the effectiveness of using the Juster Scale to predict voting behaviour, we selected one electorate in which we conducted a face-to-face survey prior to the 1990 New Zealand General Election. The electorate concerned, Palmerston North, is an urban electorate which, prior to 1990, was a safe Labour seat.

Sample and Procedure

The survey sample was randomly selected from the June 1990 Palmerston North Electoral Roll, and sample members were randomly assigned to one of two groups, one of which was interviewed using the traditional polling method while the other was interviewed using the Juster Scale method.

Respondents were interviewed over a two-day period two weeks prior to the General Election in October 1990. Two call backs were made to those respondents who were either not at home or who were unavailable at the time the interviewer called. Respondents who were not contacted after two callbacks, or who refused to participate in the study, were deleted from the sample and replaced by randomly selected respondents who lived in the same geographic area. In total, 645 contacts were made, resulting in 438 successful interviews, 16 refusals and 190 instances where the designated respondent was unavailable. This represents an overall response rate of 67.9%.

Samples for face-to-face polls are usually generated by a random walk around random starting points, however, such clustering decreases the precision of the estimates obtained. By selecting our sample randomly from the

electoral roll, we hoped to maximise the likelihood that any differences in the estimates arose from the instruments tested, not the sampling mechanism. In addition, Palmerston North has a large number of students (over 10% of the population) who remain registered in their home electorates, thus sampling the general population would have resulted in a larger proportion of ineligible respondents.

Voting registration is mandatory in New Zealand and, as the roll we used had been updated only one month prior to our sample selection, we assumed it contained an accurate listing of potential voters in this electorate.

However, a supplementary roll published immediately prior to the election contained 23,444 names, an additional 2250 potential voters who were not part of our original population. Some implications of this are discussed later in the paper.

Instruments

Three different questionnaires were used in the face-to-face interviews. One employed the traditional voting question: "If a general election had been held yesterday, which party would you have voted for?", while the others required respondents to use the Juster Scale to indicate their probability of voting for each of the parties represented in the Palmerston North electorate. The second and third versions of the questionnaire differed only in the order in which the competing parties were presented, to counter any order bias that may otherwise have arisen. All respondents then used the Juster Scale to indicate their probability of voting in the forth-coming election.

Analysis

In order to analyse the Juster Scale data, it was first necessary to adjust the probabilities given by respondents. Logically, the sum of the party probabilities allocated should have equalled each respondent's overall probability of voting. However, in many cases this did not occur, thus each respondent's party probability was recalculated using the following formula:

(Allocated party probability/sum of party probabilities) * probability of voting.

The two sets of data were also weighted so that their age-sex distribution corresponded with that of the Palmerston North electorate.

RESULTS

The results of the study are reported in two sections. The first examines the probability that respondents would cast a vote and explores the extent to which this varied among decided, undecided and declared nonvoters. The second section examines the voting predictions based on the traditional voting intention approach and the proposed Juster Scale method and compares these predictions with the actual election outcome.

Voter Turnout

The projected voter turnout, estimated by calculating the mean probability of voting, was 82.7%, which compares favourably with the electorate turnout of 84.6%. Just over 20% of the voters asked the traditional voting intention question were undecided about who they would vote for. Their probability of voting was lower than that of the "decideds", but not significantly so (see Table 1), thus reinforcing the importance of including this group when predicting voting behaviour.

Table 1: Probability of Voting

Voting Intention Category	Number in Sample	Percentage	Mean of Probability of Voting
Decided Voters	154	70.8	.93
Undecided Voters	49	22.4	.86
Non Voters	15	6.9	.29
TOTAL	218	100.00	.87

Seven percent of the sample said they would not vote, but their mean probability of voting was nearly 30%. This demonstrates the difference between a stated intention and the probability of performing that behaviour. However, the small size of this group and their low probability of voting suggests their effect on the actual election outcome would have been minimal.

Predicting Voting Behaviour

In this study, the collection of voting probabilities allowed us to calculate two sets of estimates. The first set used the traditional method of allocating undecided respondents in the same proportions as those who expressed a preference, while the second took these estimates and then weighted them by respondents'

likelihood of casting a vote. These weighted voting estimates and the estimates derived from the traditional approach to predicting voting behaviour are compared in Table 2.

Table 2: Comparison of Traditional and Probability Weighted Estimates

	Predicted Voting Behaviour ¹			
	Traditional Method	Probability of Voting	Traditional Method ²	Traditional Method ³
	%	%	%	%
Green	10.1	.87	13.0	12.1
Labour	21.3	.93	27.5	27.5
National	36.1	.97	46.5	48.3
Other	3.3	.86	4.2	3.9
Undecided	22.4	.86	-	-
Non Voters	6.8	.29	8.8 ⁴	8.2
TOTAL	100.0	.87	100.0	100.0

Notes

- 1 The question asked was "If an election had been held yesterday, which party would you have voted for?".
- 2 Undecided voters allocated proportionally to other categories.
- 3 Traditional estimates weighted by probability of voting.
- 4 This figure was calculated by weighting the survey result by the probability of voting and adding to this a relative proportion of the undecided groups. As no party had a 100% probability of voting among its supporters, the difference between the estimated probability for each party and 1 was reallocated to the non-voters.

The traditional and probability weighted estimates were both obtained after the undecided respondents had been allocated to parties in the same proportions as the decided voters. Because "decided" voters had high probabilities of voting, these two sets of estimates consequently do not vary markedly. The new method of predicting voting behaviour which we propose does not result in a group of undecided respondents and produces estimates weighted by the likelihood of voting as a matter of course. These estimates, obtained using the Juster Scale, are compared with those derived from the traditional voting intentions question and with the actual election outcome in Table 3.

Table 3: Predicted and Actual Results

Party	Traditional ¹ (n=218)	Probability Weighted ² (n=218)	Juster ³ (n=220)	Actual
	%	%	%	
Green	13.0	12.1	12.8	7.4
Labour	27.5	27.5	32.5	41.8
National	46.5	48.3	41.8	40.0
Other ⁴	13.0	12.1	12.9	10.8
TOTAL	100.0	100.0	100.0	100.0

- 1 Undecided respondents allocated proportionately to other categories.
- 2 Traditional estimates weighted by probability of voting.
- 3 Probability of voting for each party weighted by overall probability of voting.
- 4 Other includes nonvoters as well as minor parties.

The Juster Scale estimate for Labour was closest to the actual election outcome, but was not substantially different from the estimates produced by the other methods. However, this method provided a more accurate estimate of the National Party's share of the vote and was clearly a better predictor in this instance than either of the other methods. The Juster Scale method allocated more votes to the minority parties than they actually obtained; but this was characteristic of all three methods.

In order to assess the overall accuracy of the different methods, we calculated the difference between the actual outcome and the outcome predicted by each method; Table 4 contains the results of these calculations.

Table 4: Relative Accuracy of Estimates

Party	Difference Between Predicted and Actual Outcome		
	Traditional Method	Probability Weighted Method	Juster Method
Green	+5.6	+4.7	+5.4
Labour	-14.3	-14.3	-9.3
National	+6.5	+8.3	+1.8
Other	-2.2	+1.3	2.1
Absolute Average Difference	7.2	7.2	4.7
Mean Square Difference	8.4	8.6	5.8

On the basis of both the absolute average difference and the mean square difference between the predicted and actual outcome, the Juster Scale method produced more accurate voting estimates than either of the methods based on the traditional intention question. For all practical purposes, there was no difference in the relative accuracy of these latter methods.

Attempts were made to interview "undecided" respondents after the election to determine if and how they had voted. However, 25 of the 49 respondents in this group either refused to be interviewed or could not be contacted, so the conclusions drawn from this exercise can only be tentative. Nevertheless, 63% of the undecided respondents had voted for the Labour Party, 25% for National, 4% for the Green Party and 8% for other parties. This supports the argument that proportional allocation of undecided voters may actually bias rather than improve the accuracy of the final estimates.

DISCUSSION

The projected turnout figure, 87.2%, was very similar to the actual voter turnout of 84.6%. However, instead of involving a number of questions in order to develop a turnout scale, the Juster Scale method provides a simpler method of assessing voter turnout that appears just as accurate as the methods pollsters currently employ (Perry, 1979; Mitofsky, 1981). Furthermore, our results suggest that to ignore undecided voters and base estimates only on the preferences of likely voters may introduce bias, since undecided voters have a high probability of voting and show a markedly different vote distribution to decided voters (cf. Perry, 1973; Converse, 1966).

Overall, the Juster Scale method was a more accurate predictor of voting behaviour than the two alternative methods based on the traditional voting intention question. However, none of the three methods tested correctly predicted the outcome of the election. The Palmerston North electorate was won by Labour against a general trend which saw a landslide victory for the National Party.

This contradiction may be partly explained by the fact that about 10% of the voters in the electorate (2250 people) registered late and consequently were not included on the Electoral Roll from which we selected our sample. Although no formal studies of the allegiances of these people were conducted, political scientists were of the view that they were mainly

Labour supporters who registered late in a last minute attempt to stem the tide of waning support for their party. If this is so, it would help to explain why all of our predictors underestimated the level of support for Labour. In retrospect, it may have been better to have selected our samples from the whole eligible population, rather than just from the latest Electoral Roll.

As well as having a more straightforward methodology than the models present by Lampert and Tziner (1978); Perry (1979); Fenwick *et al* (1982) and Traugott and Tucker (1984), the Juster Scale method also eliminates the undecided group from polling results. Its theoretical basis appears more rigorous and logical than the attitude and intention models discussed earlier as several researchers (Juster, 1966; Pickering and Isherwood 1974; Day *et al*, 1991) have demonstrated the superior predictive ability of probability scales over intention scales.

However, while the method we have proposed appears more accurate and less complex than other methods, its accuracy could be improved, and further research is needed to compare its performance with that of other methods which take a more sophisticated approach to dealing with the undecided voter problem than proportional allocation. In addition, while the Juster Scale is easily administered face-to-face, it is more difficult to administer by phone, especially in surveys employing random digit dialling where respondents cannot be mailed a copy of the scale before the interview. Although a substantial proportion of polling studies are still conducted face-to-face, the speed and cost-efficiency of CATI surveys suggest that future research could explore methods of using the Juster Scale method in telephone interviews.

CONCLUSIONS

Undecided voters cannot be ignored by researchers attempting to predict voting behaviour through pre-election opinion polls. Furthermore, the common practice of proportional allocation of this group on the basis of preferences of respondents who have made up their minds is not sustainable theoretically or empirically. The method of predicting voting behaviour which we have proposed provides a practical and effective solution to this problem. It also addresses the fact that, despite their avowed intention, many professed non-voters actually have a probability of voting which is greater than zero.

Our research suggests that the Juster Scale can accurately predict voter turnout and that allowing voters to express support for more than one party provides more accurate estimates of their subsequent voting behaviour than forcing them to make an unequivocal choice of one party. However, our research has also identified a problem, the over-estimation of support for minor parties, which requires further study, as does the administration of the Juster Scale over the telephone. Despite these unresolved issues, this article has outlined a new and promising polling methodology which we believe merits further scrutiny and investigation.

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