

# LOCATING TDs IN POLICY SPACES: WORDSCORING DÁIL SPEECHES

*Michael Laver\* and Kenneth Benoit*

Department of Political Science  
Trinity College Dublin

## ABSTRACT

This article adapts a new technique for the computerised analysis of political texts, previously used to analyse party manifestos, to the analysis of speeches made in a legislature. The benefits of computerised text analysis come from the ability to analyse, for the first time, complex and daunting electronic sources of text, such as the parliamentary record. This allows the systematic estimation of the policy positions of individual political actors, with huge benefits both for theory development and empirical analysis. In this article, the technique is used to analyse all 58 English language speeches made in the October 1991 confidence debate on the future of the incumbent Fianna Fáil–PD coalition. The task was to use the words spoken in the debate to locate every one of the individual speakers on a ‘pro- versus anti-government’ dimension. The purpose was, first, to examine the validity of computerised text analysis when applied to legislative speeches and, second, to answer substantively interesting questions about the positions of individual Irish legislators in 1991. The results vindicate the use of computerised analysis in the context of legislative speeches and locate all speakers in the 1991 debate in a substantively interesting policy space.

## Introduction

New developments in computational text analysis within political science have been made possible by recent huge improvements in computing power. These take political science content analysis well beyond the traditional, very labour intensive hand coding of political texts, as conducted for example by the influential Manifesto Research Group

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\*Michael Laver’s work on this article was completed while he was a Government of Ireland Senior Research Fellow and Visiting Professor of Politics at the FNSP, Paris.

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(MRG), now the Comparative Manifestos Project (CMP) (Budge, Robertson and Hearl, 1987; Laver and Budge, 1982, Klingeman *et al.*, 1994; Budge *et al.*, 2001). While grounded in a very specific 'saliency theory' of party competition that has not found widespread support within the profession, the CMP data have been widely used by many who have sought time-series data on party policy positions in post-war western Europe. Until recently this has in large part been because of the phenomenal effort that would have been needed to recode all of the documents involved in a manner more suitable to the application at hand.

Computer coded content analysis, however, now offers the prospect of fast and effective coding and recoding of documents according to the research needs of a specific analyst, with no need to resort to an existing dataset simply because of the huge costs involved in doing otherwise. Successful implementations of computerised text analysis, replicating completely independent data sources, have recently been published by a number of authors (Laver and Garry, 2000; Kleinnijenhuis and Pennings, 2001; Garry, 2001; de Vries, Giannetti and Mansergh, 2001; Bara, 2001).

Nearly all published work on the computer coding of political texts has focused on the analysis of party manifestos, for several important reasons. First, for all the reasons that motivate the CMP project, party manifestos are considered important substantive statements of the policy positions of political parties, and are therefore of great research value to political scientists. Second, because the enterprise of coding these manifestos by hand is extremely resource-intensive, a successful method for computerised coding of manifestos promises enormous gains simply from a practical standpoint. Finally, because computerised methods for analyzing political texts are relatively new, it has made sense to assess the validity of the new techniques by comparing the results with those obtained using more traditional methods of scoring the policy positions of texts and the parties that issued them. As the profession becomes increasingly confident and experienced in the methodology of computer coding, however, it becomes possible to apply computerised coding to other forms of political texts, and therefore to tackle new substantive problems – including ones that would be very difficult to approach without having access to some form of fast, cheap, effective and reliable text analysis.

In this paper we present an application of computerised analysis of political texts that goes beyond the scoring of election manifestos issued political parties. Here our focus is on texts generated by individual legislators in the form of speeches made in the legislative debates. We do this using a new probabilistic 'word-scoring' method for computerised

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text analysis that has been developed and found effective by Laver, Benoit and Garry (2002), applying this to the analysis of the speeches made by Irish TDs during a long and acrimonious debate of confidence, held in October 1991, on the future of the incumbent Fianna Fáil–PD coalition government. Our aim is to estimate the positions of individual Irish legislators in a common policy space. Methodologically, this allows us to evaluate the use of computer coding in a context where it has the potential to generate huge payoffs. Substantively, it allows us to explore inter- and intra-party differences in Ireland at the level of the individual legislator, and specifically to look for potential splits within both the coalition government and the opposition.

In what follows we first outline the word-scoring technique we use and discuss issues arising from applying this to legislative speeches rather than party manifestos. Next we briefly describe the texts we analyse. We then present and discuss the results of our analysis both methodologically and substantively, concluding by drawing lessons for future uses of computerised text analysis in investigating the policy positions contained in legislative speeches.

### The Word-Scoring Approach to Computerised Text Analysis

‘Traditional’ techniques of computerised text analysis essentially count the frequencies of words found in predefined coding ‘dictionaries’. These dictionaries are lists of key words deemed a priori by the analyst, as a matter of subjective judgement guided by empirical exploration, to be associated with particular policy positions. The relative frequencies of words observed to fall into particular categories are then subjected to some form of scaling technique in order to derive estimates of the policy positions of the texts under analysis. A recent successful application of this approach to estimating the economic and social policy positions of party manifestos in Britain and Ireland is described by Laver and Garry (2000), and has subsequently been implemented for German and Norwegian party manifestos by Garry (2001) and for Dutch and Italian manifestos, as well as Irish government declarations, by de Vries, Giannetti and Mansergh (2001). An alternative dictionary-based approach, computer coding the CMP data and applying this to the European parliament, can be found in Pennings (2002). For recent essays in this area by the CMP itself, see Budge *et al.* (2001).

While this technique works well it has two paradoxical disadvantages. First, despite the fact that it is a computerised technique it remains labour-intensive in that very considerable time and effort must be applied to developing an appropriate coding dictionary upon which to ground

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the analysis, in a situation in which changes in the political lexicon across time and context may render any given coding dictionary inappropriate. Second, this highly numerical technique remains ultimately subjective in the sense that the analyst typically has considerable freedom in the construction of the word lists that comprise the computer coding dictionary.

Addressing these problems in an attempt to realise the full benefits of computer coding, Laver, Benoit and Garry (2002) have developed from first principles a probabilistic technique for coding political text that does not use predefined dictionaries and uses no subjective judgement calls by the researcher. This technique is described fully in Laver, Benoit and Garry (2002) but essentially involves the following. First, there is a preliminary analysis of a set of 'reference' texts with well-known positions on the policy dimensions in which the analyst is interested. For example, Laver, Benoit and Garry (2002) use British party manifestos in 1992 as reference texts for an analysis of the policy positions of British party manifestos in 1997, and Irish party manifestos in 1992 as reference texts for an analysis of Irish party manifestos in 1997. The technique requires that there be independent estimates of the policy positions of the reference texts on the policy dimensions under investigation. Laver, Benoit and Garry take these independent estimates from expert surveys, but any independent estimates in which the analyst is confident – for example mass survey data or even prior hand-coded content analysis – would fulfil the same role. The computer analysis of the reference texts provides no new substantive information, but is used to calculate the matrix of 'word scores' that replaces traditional coding dictionaries in the computerised analysis of new 'virgin' texts in which the analyst is interested.

This preliminary analysis of reference texts observes the relative frequencies of all words used in each text, allowing the calculation of the key quantity in the word-scoring approach. This is the conditional probability  $P_{wr}$  that the analyst is reading reference text  $r$ , given word  $w$ . Using these conditional probabilities and the known positions of the set of reference texts on policy dimension  $d$ , it is possible to assign a 'score'  $S_{wd}$  on dimension  $d$  to every word  $w$  in the word universe of the reference texts. This score is in effect a conditional estimate of the position of any text on dimension  $d$ , given that the analyst is reading word  $w$ .

Given the power of modern computers, the matrix of word scores can be calculated from the reference texts in a matter of seconds with no human intervention whatsoever. This is in stark contrast to traditional dictionary based computer coding techniques, in which the development

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of a computer coding dictionary is a major and time-consuming human research task, involving substantive judgements to be made by the analyst at every stage. To develop and test a new computer coding dictionary from scratch is a research effort that requires weeks of time on the part of the analyst. The word-scoring technique allows the matrix of word scores to be instantly recalculated whenever a new set of reference texts is deemed appropriate, or whenever improved estimates of the positions of these on the policy dimensions under investigation become available.

Using the derived matrix of word scores, it is now possible to analyse any 'virgin' text, about which the analyst has no prior knowledge. The estimated position of virgin text  $v$  on dimension  $d$  is sum of the scores of the scored words used in the virgin text, weighted by their relative frequency of occurrence. (Readers wishing to replicate this analysis should consult the full description of the method in Laver, Benoit and Garry, 2002. Necessary computer software and the raw text files analysed are available from the authors.) Given overlapping patterns of word usage between texts, and the fact that virgin texts may use words that do not appear in the reference texts, it is necessary to rescale these estimates to produce estimates of the positions of virgin texts that are denominated in the same units as the independent estimates of the positions of the reference texts. A final and very considerable advantage of this method over traditional coding techniques (e.g. the CMP scores) is that the computerised technique for the first time provides estimates of the uncertainty of each virgin text score, based on the patterns of words in the reference and virgin texts. This allows the analyst to determine whether estimated differences between texts are statistically significant, something that has not been possible within conventional political science text analysis.

In all of this it is very important to ensure that the reference texts are appropriate sources of word scores for the virgin texts under analysis, so that valid inferences about the positions of the virgin texts can be drawn using word scores derived from the reference texts. This means that independent expert advice is needed to ensure that the reference texts are 'of the same type', in the sense of having the same lexicon with the same general meaning, as the reference texts. Travel books or motorcycle repair manuals, for example, should not be used to derive word scores that are then applied to party manifestos. In a nutshell, our new approach replaces the traditional computer coding dictionary with a set of reference texts and a matrix of estimates of the policy positions of these texts on the dimensions under investigation. The reference texts, combined with the estimates of their positions do everything previously done by a coding dictionary – and much more. The human analyst is of

course not dispensed with, but his or her efforts are redirected towards seeking out the best possible reference texts and the best possible estimates of the positions of these, jobs far more appropriate to an expert analyst than those that have to be done when using traditional hand- or computer-coding techniques.

Perhaps the most remarkable feature of our approach is that it uses no knowledge whatsoever of the language in which the texts under analysis are written and, unlike any other content analysis, the technique can therefore be applied to languages not understood by the analyst. The only data required are the patterns of word frequencies in both reference and virgin texts, and independent estimates of the policy positions of the reference texts. Intuitively, what the technique does is to match virgin texts probabilistically, given their patterns of word usage, to reference texts with known policy positions. Laver, Benoit and Garry (2002) have applied this approach very successfully to the analysis of British, German and Irish party manifestos, using manifestos from prior elections as reference texts. They were able to replicate utterly independent estimates of the positions of the virgin texts that they analysed, even on what had for previous content analysts been the very troublesome liberal-conservative dimension of social policy, and even in a language that they do not speak.

### **Migrating Word-Scoring from Manifestos to Speeches**

Once the efficacy of the word-scoring technique when applied to party manifestos has been demonstrated, the next task is to put it to work in areas where computerised text analysis can take on tasks that are simply too daunting for human coders. One obvious application is to the analysis of parliamentary speeches. Always preserved verbatim as part of the written parliamentary record, these speeches have become highly amenable to computerised analysis following their publication on legislative websites. For example, every recorded word spoken in both houses of the Oireachtas since the foundation of the state is now available in a searchable record at the Houses of the Oireachtas website: <<http://www.irlgov.ie/oireachtas>>.<sup>1</sup> This allows estimates to be made of the policy positions of individual legislators, opening up the possibility of far more sophisticated and detailed analyses of intra- and inter-party legislative politics than have been hitherto feasible.

Major issues must be resolved, however, if we wish to migrate techniques of computerised text analysis from the analysis of party manifestos to the analysis of legislative speeches. These issues are ever-present when shifting text analysis from one context to another, but

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computerised text analysis forces us to confront them in a very explicit form. Key distinctions for our purposes include the following:

- Manifestos are *encyclopaedic* documents dealing with a wide range of policy issues; speeches tend to be restricted to a limited number of subjects.
- Manifestos are published in a *clearly-defined political context* that allows one manifesto to be compared to another; much more care must be taken in establishing the political context of speeches, if we are to justify the comparison of different speeches in the same analysis.
- Manifestos and speeches use *different language registers* and different lexicons. It thus seems likely that the analysis of manifestos and speeches will require different types of reference text.
- Speeches tend to be *much shorter than manifestos*. With fewer words to analyse, our statistical confidence in the results is likely to be reduced.

In almost every respect, therefore, the analysis of legislative speeches will be more problematic than the analysis of party manifestos. Nonetheless it is well worth attempting since the potential returns are so great.

In order to minimise some of these problems and yet take a first step in the desired direction, the analysis reported below sets out to estimate the positions of individual legislators in a major debate on a motion of confidence in the Irish government, conducted over the three days of 16–18 October 1991.<sup>2</sup> This has the advantage that it was a major debate with 59 set-piece speeches, including speeches by each of the party leaders, generating a written record of just over 167,000 words. We set out here to estimate the extent to which legislators expressed themselves as pro- or anti- government in this debate. This has the methodological advantage that we can uncontroversially select certain speeches as reference texts from which to derive word scores – notably the set-piece speeches of the Taoiseach and Leader of the Opposition, which we assume a priori to be definitively pro- and anti-government respectively.

### Estimating the Positions of Irish Legislators on *A Priori* Policy Scales

#### *Data*

The full text of the debate under investigation was downloaded from the Houses of the Oireachtas website (see above). The transcript of the debate is a verbatim account of everything that was said, in all its gory details, including interruptions, insults, general *mêlée*, interventions from the chair, members occasionally being ejected for disorderly behaviour, points of order and procedure, and so on. However, aside from these knockabout

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elements, the debate was very tightly structured. Each legislator allowed to speak was allotted a strictly enforced time period according to long-established conventions and standing orders, and made a single speech within this. Back bench members often agreed to share their allotted time with others from the same party, allowing more people the chance to put their names on the parliamentary record as having spoken. It was thus not difficult to extract the set-piece 59 speeches made by different legislators in the debate under investigation and convert these into text files for analysis.

These texts were analysed using the word-scoring method to establish the position of the speakers on a 'pro- versus anti-government' dimension taken as being the essence of the debate. The reference positions of certain party leaders on the 'pro- versus anti-government' dimension were assumed a priori to be self-evident. The speech of the Taoiseach, as leader of the government, was assumed axiomatically to be pro-government and assigned a reference position of +1.0 on the pro- versus anti- government dimension. The speech of the Fine Gael leader of the day and leader of the opposition, John Bruton, was assumed axiomatically to be anti-government and assigned a reference position of -1.0. The speech of one other party leader was assumed axiomatically to be anti-government – that of Prionsias de Rossa, then leader of the Workers' Party (most of which was soon to become Democratic Left). Thus the speeches of these three party leaders were taken as our reference texts with independently known reference positions. This allowed the calculation of word scores for all different words used in the debate in at least one of the reference texts – a total of 2,856 different words in all. Having calculated word scores from the reference texts, it was then possible to estimate the positions of 55 other speakers on the pro- versus anti-government dimension using the method described above.<sup>3</sup>

Turning first to the speeches of the leaders of the other main Dáil parties, that of Labour leader Dick Spring was treated as a virgin text, the position of which was to be estimated as a matter of substantive interest. This was because Labour was to go into a coalition government with Fianna Fáil in 1992, and in the light of this it was considered important to assess whether, at that time, the Labour leader was giving hints of a more pro-government disposition. Similarly the speech of PD leader Des O'Malley, a government minister during the 1991 confidence debate, was treated as a virgin text with a position to be estimated. This was because the PDs were shortly to leave coalition with Fianna Fáil, and in the light of this it was considered substantively important to assess whether his speech showed indications of a less than wholehearted pro-government position. The speeches of all other TDs who spoke in the debate were treated as virgin texts, the positions of which were to be estimated.



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*Results*

Scores for all 55 non-reference speakers in the 1991 confidence debate are given in Appendix 1, both in raw form and standardised over all 55 observations to allow comparisons to be made more clearly.<sup>4</sup> The TDs are ranked from anti- to pro-government according to the score estimated from their speech in the debate. The results are a remarkable vindication of the word-scoring technique as applied to legislative speeches.

Very striking indeed is the pattern in which all Fianna Fáil ministers are clustered together at the pro-government end of the scale, while the anti-government end of the scale is almost entirely populated by Fine Gael and Labour opposition TDs (plus one or two stray Fianna Fáil backbenchers). This gives the scale very strong face validity. It is important to note in this context that the scores in Appendix 1 are derived entirely 'automatically' by the technique, using the word frequencies in each speech and the word scores derived from the reference texts, but no knowledge whatsoever of the identity or party affiliation of the speaker. Thus the clustering of Fianna Fáil ministers is entirely a product of the statistical pattern of word usage in their speeches, since the computer had no knowledge of the fact that it was analysing Fianna Fáil ministerial speeches when estimating these scores.

The patterns in Appendix 1 are summarised in Table 1 and Figure 1, which gives mean scores on the pro- versus anti-government dimension, by category of speaker. Fianna Fáil ministers, as we might expect, were overwhelmingly the most pro-government speakers in the debate, with Fianna Fáil TDs on average less pro-government in their speeches. At the other end of the scale, Labour, Fine Gael and Workers' Party TDs were the most systematically anti-government in their speeches, closely followed by the sole Green TD.

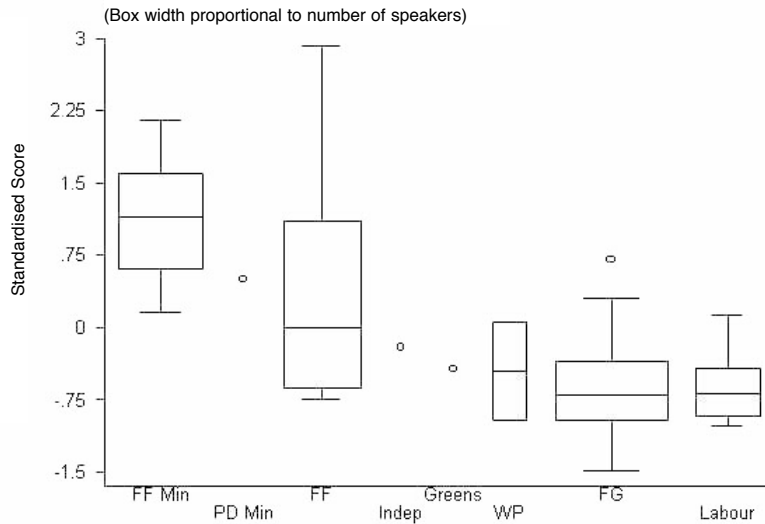
TABLE 1  
MEAN RAW AND STANDARDISED SCORES OF SPEAKERS IN  
1991 CONFIDENCE DEBATE ON 'PRO- VERSUS ANTI- GOVERNMENT'  
DIMENSION, BY CATEGORY OF TD

Group	N	Raw mean	Raw SD	Standardised mean	Standardised SD
FF Ministers	12	-0.2571	0.0383	1.15	0.66
PD Minister	1	-0.2947	-	0.50	-
FF	10	-0.2999	0.0721	0.41	1.24
Independent	1	-0.3360	-	-0.21	-
Greens	1	-0.3488	-	-0.43	-
WP	2	-0.3501	0.0423	-0.46	0.73
FG	21	-0.3580	0.0306	-0.59	0.53
Labour	7	-0.3599	0.0220	-0.62	0.38

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FIGURE 1

BOX PLOT OF STANDARDISED SCORES OF SPEAKERS IN 1991 CONFIDENCE DEBATE ON 'PRO- VERSUS ANTI- GOVERNMENT 'DIMENSION, BY CATEGORY OF TD



*Note:* Boxes indicate the medians and interquartile ranges of each group's standardised scores. The width of each box is proportional to the number of speakers in each category.

The remarkable face validity of the scale reported in Appendix 1 and Table 1 gives us some encouragement to use the scores generated to draw substantive conclusions about the relative positions of individual speakers. We turn first to the two substantive questions left deliberately open by our research design, the positions of Des O'Malley (a government minister and PD leader) and of Labour leader Dick Spring (then a prominent opposition party leader but also a future Tanaiste and Fianna Fáil coalition partner). The scores reported in Appendix 1 give answers to these questions. The position of Des O'Malley was less staunchly pro-government than that of most of his Fianna Fáil ministerial colleagues, though Fianna Fáil ministers Flynn, Brennan and Burke were in the same territory. Simply on the basis of the words used in this confidence debate, O'Malley would not have been picked out as a speaker who was not a Fianna Fáil minister, though his support for the government would have been estimated as distinctly lukewarm. On the other hand, Dick Spring's speech scored very solidly in the anti-government camp, with no indication whatsoever from his words in this

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debate that he was being ‘soft’ on the government in this debate in anticipation of future coalition negotiations.

Fianna Fáil back bench TDs were a much more varied bunch with some, such as Nolan and Cullimore, being among the most avidly pro-government, while others such as McDaid, Roche and Daverne gave speeches that would have been indistinguishable on the pro-versus anti-government dimension from those of Fine Gael TDs. On the Fine Gael side, the main maverick speech came from former Taoiseach Garret FitzGerald, whose pattern of word usage in his speech looked like that of a government minister. Other Fine Gael TDs whose speeches were much less hostile to the government than those of their colleagues included Ivan Yates and Peter Barry, while the most violently anti-government speeches of all came from Fine Gael TDs Owen, Connaughton and Durkan.

### Conclusions

Taking a first step away from the analysis of party manifestos, these results must be seen as a considerable vindication of the language-blind word-scoring technique as applied to parliamentary speeches. The important thing has been to maintain a clear sense of appropriate reference texts and their positions on the scales to be estimated. In this sense, the current study was conservative in analysing a confidence debate and in taking the set-piece speeches of government and opposition party leaders as reference texts for pro- and anti-government positions. However, this conservatism paid off, in that it allowed the estimation of a scale with very good face validity, on which the 54 other English-language speakers in the debate could be convincingly located. Substantively, this allowed us to answer some intriguing questions about the position of the PDs in government and the Labour Party in opposition, but the main conclusions to be drawn are methodological. The word-scoring technique has migrated here from the analysis of party manifestos to the analysis of parliamentary speeches, allowing for the first time the location of individual legislators in a common policy space, based solely upon the words they utter in parliament. This implies that, applied carefully, the technique really does have considerable potential quickly and easily to generate exciting new datasets from easily available raw material.

In this context it is worth taking note of the types of data to which this analysis suggests computerised word-scoring might be applied. First, it should be remembered that the technique is ‘language blind’, in the sense no use whatsoever was made of any knowledge of the English language when deriving the estimated positions reported in Appendix 1 and Table

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1. The speeches analysed could have been delivered in any language at all, provided that the reference texts were in the same language, to allow appropriate word scores to be calculated. This in itself is a tremendously empowering feature of the technique since it vastly extends the methodological armoury of the serious comparative researcher. Second, the technique can be applied to texts generated in any political era, provided that these are either available in or can be converted into electronic form. This is another considerable breakthrough for the systematic analysis of the policy positions of political actors. Many of the conventional methods for estimating such positions (for example election studies and expert surveys) work only in prospect. They can be used to estimate present policy positions but cannot be applied in retrospect with any degree of reliability or validity. The technique we demonstrated here, in contrast, could just as easily be used to estimate the policy positions of politicians in ancient Greece or Rome, provided that appropriate reference and virgin texts were available. In other words, this approach extends the reach of systematic data analysis not only sideways into a range of different cultural contexts, but backwards as far back into time as appropriate text sources are available. Given this we feel that the approach we have used here, or something similar, merits considerable further intellectual investment in its development.

## Notes

1. We set on one side the interesting constitutional issues arising from having the Irish legislature's main website as a subset of that of the Irish government.
2. The legislative convention in Ireland, when the government is faced with an actual or threatened motion of no confidence proposed by the opposition, is that the government converts this into a confidence motion. Under the Constitution, a government that loses a confidence motion must resign. Once a confidence motion has been lost and the government has resigned there is as a matter of practice almost always an election, although in these circumstances the president is not constitutionally obliged to dissolve the legislature and call one. The only time that a government deemed to have lost the confidence of the legislature was replaced by another government without an election was in December 1994.
3. One speaker, former Fine Gael leader Alan Dukes, had to be excluded because his speech was entirely in Irish, while the party leaders did not use Irish in their 'reference' speeches so that no scores could be calculated in this instance for Irish language words. Nonetheless it would have been perfectly possible to calculate such scores had Irish language reference texts been available.
4. The fact that all raw scores are negative is entirely an artifact of the fact that two anti-government speeches were used to calculate the word scores, but only one pro-government speech.

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MICHAEL LAVER is Professor of Political Science at Trinity College Dublin and was previously Professor of Politics and Sociology at University College Galway. His current research interests are in theories of party competition and government formation and in the empirical estimation of the preferences of political actors. Recent publications in these fields include (with Kenneth A. Shepsle) *Making and Breaking Governments* (Cambridge, 1996) and *Estimating the Policy Positions of Political Actors* (Routledge, 2001). Address: Department of Political Science, Trinity College, Dublin 2, Ireland. Tel.: +353-1-608-2036; fax +353-1-677-0546. E-mail: <mlaver@tcd.ie>.

KENNETH BENOIT is a Lecturer and Director of Graduate Studies in the Department of Political Science, Trinity College, University of Dublin. His research interests are comparative party and electoral systems, comparative elections, research methodology, and Eastern European politics. He has published in a variety of journals, including the *European Journal of Political Research*, *Electoral Studies*, and the *Journal of Theoretical Politics*. He received his PhD from Harvard University in 1998. Address: Department of Political Science, Trinity College, 1 Foster Place, Dublin 2, Ireland. E-mail: <kbenoit@tcd.ie>.

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## Appendix 1:

Raw and Standardised Scores of Speakers in 1991 Confidence Debate on  
'Pro- versus Anti- Government' Dimension

Speaker	Party sore	Position	Raw	SE	Standard- ised score	Total length in words	Unique words*	% words scored
<i>Reference Texts</i>								
Haughey	FF	Taoiseach	1.0000	-	-	6,711	1617	-
Bruton	FG	Leader	-1.0000	-	-	4,375	1181	-
de Rossa	DL	Leader	-1.0000	-	-	6,226	1536	-
<i>Virgin Texts</i>								
Nolan	FF		-0.1542	0.0150	2.92	1,238	393	92.6
Wilson	FF	Minister	-0.1990	0.0090	2.15	3,944	763	84.8
Reynolds A	FF	Minister	-0.1991	0.0080	2.14	4,474	873	88.4
Cullimore	FF		-0.2194	0.0200	1.80	669	261	90.1
Collins	FF	Minister	-0.2245	0.0080	1.71	4,440	754	85.2
Leyden	FF	Minister (Jr)	-0.2377	0.0090	1.48	3,219	674	87.3
Woods	FF	Minister	-0.2462	0.0090	1.33	3,697	743	87.1
O'Hanlon	FF	Minister	-0.2495	0.0080	1.28	4,155	791	88.1
Hillery	FF		-0.2600	0.0110	1.10	1,963	488	89.7
OKennedy	FF	Minister	-0.2659	0.0080	1.00	4,249	742	87.8
Daly	FF	Minister	-0.2697	0.0080	0.93	3,250	611	87.5
Cowan	FF		-0.2702	0.0120	0.92	1,571	401	90.8
ORourke	FF	Minister	-0.2758	0.0080	0.82	4,178	712	85.4
FitzGerald	FG		-0.2833	0.0110	0.70	2,068	529	87.4
O'Malley	PD	Minister	-0.2947	0.0090	0.50	2,818	593	89.3
Flynn	FF	Minister	-0.3010	0.0080	0.39	3,557	703	82.4
Brennan	FF	Minister	-0.3020	0.0090	0.37	2,917	634	89.0
Barry	FG		-0.3063	0.0090	0.30	2,789	613	90.9
Burke	FF	Minister	-0.3144	0.0080	0.16	3,758	689	81.4
Yates	FG		-0.3156	0.0080	0.14	3,465	748	88.4
Stagg	Lab		-0.3167	0.0130	0.12	1,451	377	88.8
Gilmore	WP		-0.3202	0.0150	0.06	970	269	86.1
Lenihan	FF		-0.3222	0.0080	0.03	3,241	578	91.7
O'Donoghue	FF		-0.3263	0.0150	-0.04	815	254	89.2
Flaherty	FG		-0.3344	0.0090	-0.18	2,352	532	88.9
HigginsJ	FG		-0.3348	0.0090	-0.19	3,546	590	84.9
Blaney	Ind		-0.3360	0.0080	-0.21	3,314	582	89.7
Kenny	FG		-0.3441	0.0170	-0.35	764	260	88.0
Browne	FG		-0.3458	0.0130	-0.38	1,038	292	93.4
Quinn	Lab		-0.3480	0.0090	-0.42	2,683	575	89.1
Garland	Greens		-0.3488	0.0130	-0.43	1,445	415	85.5
Creed	FG		-0.3497	0.0100	-0.45	2,086	492	88.9
Ahern D	FF		-0.3555	0.0100	-0.55	2,062	440	87.5
Boylan	FG		-0.3585	0.0110	-0.60	1,611	394	87.9
Noonan	FG		-0.3592	0.0090	-0.61	2,574	573	88.2
Roche	FF		-0.3601	0.0080	-0.63	3,320	662	85.6
Howlin	Lab		-0.3633	0.0180	-0.68	625	232	91.2
Higgins MD	Lab		-0.3638	0.0090	-0.69	2,224	475	88.0
Reynolds G	FG		-0.3646	0.0150	-0.71	730	252	93.3
McDaid	FF		-0.3647	0.0120	-0.71	1,401	375	85.4
Davern	FF		-0.3668	0.0110	-0.74	1,534	384	89.0

## LOCATING TDS IN POLICY SPACES

## Appendix 1 (Cont'd)

Speaker	Party sore	Position	Raw	SE	Standard- ised score	Total length in words	Unique words*	% words scored
O' Shea	Lab		-0.3679	0.0090	-0.76	2,460	537	89.3
TaylorQuinn	FG		-0.3693	0.0100	-0.79	1,839	438	90.0
BrutonR	FG		-0.3711	0.0130	-0.82	1,188	347	85.2
Ahearn	FG		-0.3730	0.0110	-0.85	1,438	361	90.0
Spring	Lab		-0.3770	0.0060	-0.92	6,396	924	86.4
Finucane	FG		-0.3792	0.0150	-0.96	730	248	90.8
Currie	FG		-0.3797	0.0120	-0.96	1,273	361	88.2
Rabbitte	WP		-0.3800	0.0090	-0.97	3,031	641	85.0
Deasy	FG		-0.3820	0.0090	-1.00	2,414	508	87.1
Ferris	Lab		-0.3827	0.0120	-1.02	1,191	342	88.2
Deenihan	FG		-0.3834	0.0140	-1.03	946	285	85.2
Owen	FG		-0.3845	0.0080	-1.05	3,012	542	82.4
Connaughton	FG		-0.3898	0.0130	-1.14	1,243	372	86.2
Durkan	FG		-0.4104	0.0130	-1.49	868	262	89.1

*Note:* \*Unique words for virgin texts refers to scored words only. The percentage of words scored refers to the total (non-unique) words scorable from the reference texts relative to the total number of words in the text. Standard errors are computed as per Laver, Benoit and Garry (2002).