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# To dichotomize or not to dichotomize?

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The forum article by Sven-Oliver Proksch and James Lo (henceforth P&L) is a welcome contribution, not only to party positioning on European integration but also to broader issues of dimensionality. P&L claim that estimates of party positioning on European integration – and the Chapel Hill expert survey (CHES) in particular – are only weakly continuous and that party positioning on Europe is therefore best conceived as a dichotomous, not continuous, dimension.

Here we produce a more complete cross-validation of the Chapel Hill and Benoit–Laver data sets and show that P&L’s findings are sensitive to arbitrary assumptions that diminish continuity. We re-evaluate the case for dichotomizing the data and argue that this makes sense only under restrictive conditions.

Table 1 replicates P&L’s cross-validation of the 2002 Chapel Hill data set with the 2003 Benoit–Laver data set (see Benoit and Laver, 2006). Both data sets provide mean values of expert judgments and are comparable data sets estimating the positioning of political parties across the EU on support for national sovereignty versus support for more European integration. There are some differences: (1) the relevant questions are differently worded and the direction is reversed; (2) Benoit–Laver asks experts about the positioning of the political party as a whole, whereas CHES asks experts to place the leadership of the political party; and (3) the surveys were conducted about a year apart (see Marks et al., 2007).

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**Table 1.** Correlation of expert surveys of party positions on European integration

Range	A		B		C	
	Correlation	N	Correlation	N	Correlation	N
Full range: 1–7	0.88	67	0.90	73	0.89	124
1–3	0.89	9	0.94	11	0.89	16
2–4	0.74	11	0.73	12	0.71	18
3–5	0.45	15	0.47	16	0.62	27
4–6	0.80	26	0.80	27	0.75	44
5–7	0.26	46	0.29	49	0.46	86

Notes: A: Re-analysis of Proksch-Lo's (2012: Table 1) comparison of CHES and Benoit-Laver datasets; B: Comparison of all observations common to the CHES and Benoit-Laver datasets; C: Comparison of all observations common to the CHES, Benoit-Laver and Rohrschneider-Whitefield datasets.

However, as Table 1 shows, the association between expert placements in the two surveys is strong: around 0.88 for the 67 cases analyzed by P&L, and 0.90 in the full set of 73 parties that are common to the Chapel Hill and Benoit-Laver data sets.<sup>1</sup>

Table 1 follows P&L by breaking down the six-interval scale used in the Chapel Hill survey into terciles. To ease comparison, we reverse the scale for the Benoit-Laver data set. Interestingly, the results differ from those reported by P&L. Whereas P&L detect a *negative* association of 0.21 for the middle (3–5) tercile (Proksch and Lo, 2012: Table 1), we detect *positive* associations of 0.45 and 0.47.

The reasons for this take one to the heart of cross-validation under small *n*. When the number of cases is small, little decisions – and even apparent non-decisions – can have large consequences. Table 1 examines parties along two-point ranges on a six-interval scale. So, when we specify 3–5 in the left column, we include parties scoring from 3.0 to 5.0. This may not strike the reader as important, but it explains the discrepancy: 15 political parties have scores between 3.0 and 5.0, but 12 parties have scores greater than 3 but less than 5. When the *n* is this small, subtracting three cases can transform a positive association of 0.45 into a negative association of 0.21.

The smaller the number of cases, the greater is the probability that one will find weak continuity across a partial range along the relevant dimension. So it is not particularly surprising that associations between two correlated variables will vary along fragments of the scale. This is precisely why explanations that restrict variation along the dependent variable are suspect.

Let us take a closer look at the data and examine all terciles. The weakest association is at the high end of the scale, between 5 and 7. However, it is not true that scale reliability is weak among pro-integration parties. In fact, scale reliability is rather strong ( $r = .80$ ) among parties in the 4–6 range, that is among political parties that vary across most of the positive side of the scale.

The final columns of Table 1 compare the Chapel Hill survey with a data set that combines the 73 West European parties estimated by Benoit–Laver and CHES with 51 East European parties estimated by the 2002 Rohrschneider–Whitefield data set and CHES.<sup>2</sup> The associations for all terciles are positive and strong. Although it is most difficult for experts to distinguish between parties that are most supportive of European integration, even there the association is 0.46.

### **What would speak against a continuum?**

One can think of both theoretical and empirical reasons to avoid treating EU party positions as a continuum and consider them as a dichotomy instead. We shall focus mostly on the empirical side in this response, but point out that the theoretical basis for a dichotomy is rather thin. For if we take P&L seriously, we would have to conclude that European integration is a directional issue in the strongest sense, namely that only the side a party takes matters and not the intensity of its position. Not even directional theory goes this far (see Rabinowitz and Macdonald, 1989) and such an account of European integration certainly seems to go against the literature (for example the EU issue voting literature) (De Vries, 2010). What is more, treating European integration as a dichotomy means this issue is fundamentally different from any other issue, whether it be economic, social, or foreign policy. One needs strong arguments for this claim and we are not convinced P&L have provided these.

Let us now turn to the empirical side. One justification for treating European integration as a dichotomy is that neutral positions are just not that common. For the set of parties that P&L analyze, neutral positions are indeed relatively rare: they occur in 15 percent of the cases. However, this is still more than the 14 percent of occurrences of anti-integration positions. Moreover, when we consider the whole set of parties in the CHES, then neutrality is by no means a rare phenomenon, occurring in some 29 percent of the cases.

Another reason we might opt to treat EU party positions as a dichotomy is that experts cannot reliably categorize neutral parties or the intensity of pro- and anti-integration positions. In other words, experts agree only on whether a party favors or opposes European integration and are divided on pretty much everything else.

There is, indeed, a remarkable consensus among experts in terms of the direction of a party's EU stance. Across all parties that P&L classify as pro-integration, 80 percent of the experts give those parties an integration score of 6 or 7 in the CHES. For parties that are classified as anti-integration, the expert consensus is not as good: 60 percent of the experts agree on this party classification.

How do things look for parties with a neutral EU stance? Does expert consensus break down for such parties? One relevant diagnostic is whether experts agree on party neutrality vis-à-vis integration. It is possible that a party is classified as neutral merely because some experts rate it as anti-integration, whereas others view it as pro-integration. This kind of party placement would have a fundamentally

different meaning than when a neutral party classification results from experts viewing the party as such. It appears, however, that most experts assign a neutral rating to a party that, on the whole, is classified as neutral (76 percent of experts give such a rating). This hardly seems to be evidence that experts are 'all over the place' when it comes to parties with a neutral position on the EU.

What about inter-expert agreement on the intensity of party EU stances that are either pro- or anti-integration? Can experts agree on the intensity of a party's stance on European integration? The answer is affirmative. When considering parties that are classified as anti-integration by experts, there is 76 percent agreement on the question of whether the party is 'strongly opposed' or 'opposed.' For pro-integration parties, there is 73 percent agreement among experts as to whether the party 'favors' or 'strongly favors' integration. Since experts could choose between only two options on the pro and on the contra side, we would expect a 50 percent agreement if they were to select a response option by chance. The experts are doing considerably better than this.

### **What would speak for a dichotomy?**

P&L suggest that in most studies of EU integration comparable results could be obtained with a dichotomous anti-European vs. pro-European dummy variable. A dichotomy with the same causal power as a continuum outperforms the latter. However, Table 2 reveals that dichotomizing the European integration dimension can produce type II error, particularly when one dichotomizes in the way that P&L suggest.

Several studies link party positioning on European integration to the positions that parties take on economic issues and on social issues. The former is summarized by the economic left/right dimension and the latter is summarized by a sociocultural gal/tan dimension ('green, alternative, libertarian' vs. 'traditionalist, authoritarian, nationalist'). Table 2 reveals that these independent variables are significantly associated with the continuous dimension of party positioning on Europe, but that the dichotomous variable suggested by P&L, with a breakpoint at 2, considerably flattens associations.

If one does wish to dichotomize, the selection of the dividing point should be informed by theory. The Chapel Hill measure conceives a continuum from strongly opposing to strongly supporting European integration, with a middle point at 4. One should consider dichotomizing around this point. Although a dichotomous variable with a breakpoint at 4 produces associations that are weaker than the continuous variable, they are considerably stronger than a dichotomous variable with a breakpoint at 2.

This is not to say that dichotomizing data is never a good idea. It depends on the loss of information relative to the gain in simplicity and reliability. Hooghe and Marks (2005), for example, find that the causal power of a closed-ended response to a question tapping European and national identity can be captured by dichotomizing respondents into two categories: exclusive and inclusive nationalists.

**Table 2.** European integration as continuous vs. dichotomous variable

	Continuous variable	Dichotomy Proksch–Lo	Dichotomy anti vs. pro
Economic left/right	0.261*** (0.039)	0.062 (0.212)	0.184 (0.137)
Gal/tan	-0.350*** (0.035)	-0.370* (0.179)	-0.612*** (0.147)
Economic left/right quadratic	-0.107*** (0.017)	-0.076 (0.083)	-0.350*** (0.080)
Gal/tan quadratic	-0.071*** (0.016)	-0.139 (0.076)	-0.199** (0.063)
Government participation (in year of survey)	0.224 (0.178)	31.77 (5973.3)	1.774 (0.903)
Party size (vote percentage in national election prior to survey)	0.015* (0.007)	0.000 (0.047)	0.039 (0.039)

Notes:  $N = 98$  (EU-West), 2002 Chapel Hill expert survey.

\*\*\*  $p < .001$  level; \*\*  $p < .01$  level; \*  $p < .05$  level.

In this instance, the additional information within the categories does not add much to the variance explained by the dichotomy. There is no blanket rule – it depends on what one wishes to explain. We should point out, however, that there is a perfectly good intermediate position between treating the EU as a continuum and treating it as a dichotomy, and that is to treat it as an ordinal scale.

P&L's contribution combines cross-validation with an analysis of the extent to which a variable may be estimated as a continuous dimension, and raises important issues of interest to researchers on Europe. We conclude by noting that (1) great caution should be used when dichotomizing a dependent variable; (2) conceptualization of a dimension cannot be evaluated apart from the hypothesis that one wishes to test; and (3) it is rarely useful, and often wasteful, to reduce variation in the party positioning on European integration to a dichotomous variable.

## Notes

1. The six additional parties common to these data sets are: the Belgian party Agalev/Groen, the Danish People's Party (DF), the Greek Communist Party (KKE), the Italian parties Biancofiore and Margharita, and the Finnish Christian Union (SKL). Like P&L we exclude the Portuguese CDU, an electoral coalition between the Portuguese Communist Party (PCP) and the Ecologist Party (Os Verdes or PEV), which was polled as a single party in the Chapel Hill survey and as two parties in the Benoit–Laver survey.
2. Congruence between the Chapel Hill and Rohrschneider–Whitefield data for those 51 parties is high ( $r = .96$ ) despite the fact that the surveys (1) used differently worded

questions; (2) took place at different time points (September 2002 – May 2003 vs. November 2003 – March 2004); (3) tapped positioning of party leadership vs. that of the political party; and (4) employed different experts. The Chapel Hill and Rohrschneider–Whitefield teams compared their expert lists and discovered that, of 209 experts, only 5 responded to both surveys (Whitefield et al., 2007). So any congruence cannot be explained by expert duplication.

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