

Reply to the discussion

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I am most grateful to Andrew Gelman for his nice, informative comments. In particular, I welcome his effort in pointing out the connections between the methods we used, derived from first principles from a Bayesian viewpoint, and some standard methods currently in use. I will now try to answer some of his more specific points.

1. *Proportionality*. Although d'Hondt rule provides nearly perfect proportional representation when a large number of seats is *simultaneously* allocated, this is not so much the case when, as in the case of Spain, allocation is made by provinces, and then aggregated. For instance, in the last, March 1996, national elections which gave the power to the conservatives in the Spanish national government, conservatives and socialists obtained 39.2% and 37.9% of the votes respectively, but 156 (44.6%) and 141 (40.3%) of the 350 seats.

2. *Sampling method*. Gelman is certainly right when he says that it is not *necessary* that the average votes in the sampled electoral sections mirror the average vote in the State, as long as the differences between sample and population are predictable. However, (i) we have reasons to believe that mirror imaging provides a more robust procedure if —by unforeseen reasons—, some of the sections cannot be sampled or have been distorted by developments changing their political behaviour, and (ii) we repeatedly used the same design for general purpose questionnaires, not necessarily oriented to predicting elections and, in that case, the differences between sample and population would not be easily predictable.

3. *Reference distributions*. The models discussed in Little (1993) are indeed very interesting; I look forward an opportunity to devote some effort to compare them with those we have been using. Nevertheless, reference distributions could (and I believe should) be also used in that context, in only to gain information on the robustness of the results to sensible modifications on the prior assumptions. Indeed, I would expect the appropriate reference prior for their hierarchical model, (see Berger and Bernardo, 1992) to behave better in this context than the conventional 'non-informative' prior $\pi(\mu, \log \tau^2, \log \sigma_h^2) \propto 1$ used by Little.

4. *Election and survey results*. Certainly, past election results could be use in analyzing survey results, much as we used them in forecasting new election results. Actually, the important relations between both type of results are demonstrated by the conditional distributions of the survey results given past election results, as shown, for instance, in the last block of the table included in Figure 1.

5. *Posterior uncertainty*. Gelman is obviously right when he says that forecasts should be accompanied by measures of their uncertainty. As a matter of fact, our software produces them systematically; to skip them in tables such as that partially showed in Figure 1 is only an effort to make large tables more readable. In more important summary results, such as those reproduced in Figure 2, the posterior standard deviations of the vote forecasts, and the possible if not very likely seat distributions, —politically more relevant—, are explicitly stated.

6. *Grafical displays*. We also agree that symbol coding is less likely to be misinterpreted, and often more informative than the shadow coding which politicians often prefer. We often combined both methods; Figure 6 below, taken from one the result books, is one example.

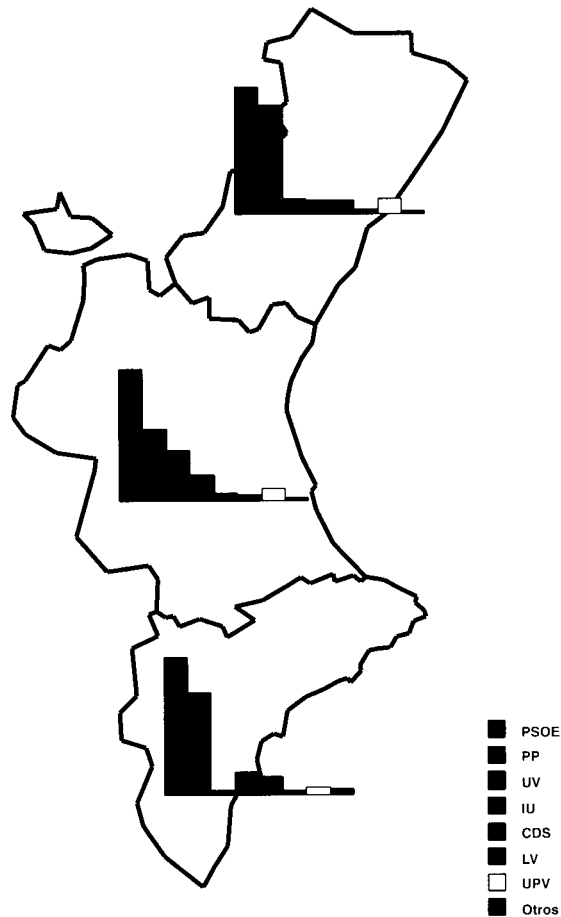


Figure 6. *Reproduction of a page showing electoral results by county*

7. *Nonvoters.* Gelman is again right when he points out that the construction of the transition matrix requires some assumption on the behaviour of nonvoters. To start the iterative algorithm, we took as the vote distribution of nonvoters the corresponding estimate from the last opinion poll, where this could be forecasted from the answers of people who declared their intention of no voting. Deming and Stephan iterative algorithm eventually adjusts this starting point to the observed proportion of nonvoters.

REFERENCES

- Berger, J. O. and Bernardo, J. M. (1992). Reference priors in a variance components problem. *Bayesian Analysis in Statistics and Econometrics* (P. K. Goel and N. S. Iyengar, eds.). Berlin: Springer, 323–340.
- Little, R. J. A. (1993). Post-stratification: a modeler’s perspective. *J. Amer. Statist. Assoc.* **88**, 1001–1012.

Prioridades de la Generalitat

De entre los diferentes servicios públicos que gestiona la *Generalitat Valenciana* ¿puede decirme los que en estos momentos deberían considerarse prioritarios?

1. Sanidad (ambulatorios, hospitales, control de alimentos, ...).
2. Seguridad Ciudadana.
3. Vivienda (oferta y precios).
4. Educación (pública o subvencionada).
5. Medio Ambiente (humos, ruidos, basuras, ...).
6. Tiempo Libre (instalaciones deportivas, espectáculos, exposiciones, ...).
7. Infraestructuras viarias (autobuses, ferrocarriles, ...).
8. Transporte público (autobuses, ferrocarriles, ...).
9. Otras

		1	2	3	4	5	Otr	Totales
Comunidad Valenciana		34.9	19.1	13.6	14.2	11.4	6.8	1545
Provincia de Alicante		34.3	21.0	14.9	15.5	9.0	5.2	380
Provincia de Castellón		36.7	17.8	10.6	14.6	12.6	7.7	386
Provincia de Valencia		34.9	18.2	13.6	13.4	12.5	7.4	779
Ciudad de Valencia		34.1	17.6	15.6	14.3	10.5	8.0	389
Resto de Valencia		35.3	18.5	12.4	12.9	13.6	7.2	390
<i>Intención voto</i>	Abs	33.0	21.2	18.4	13.6	8.5	5.3	255
	PP	37.8	19.1	13.7	12.7	8.6	8.0	445
	PSOE	36.4	22.9	10.6	11.0	11.6	7.6	340
	EU	33.0	14.8	12.0	18.4	17.4	4.5	164
	UV	39.4	21.2	5.3	10.0	16.2	8.0	68

Figure 1.

Elecciones Autonómicas 1995 Comunidad Valenciana

Datos históricos relevantes

Autonómicas 1991	PP	PSOE	EU	UV	UPV	Otr
% votos	28.1	43.2	7.6	10.4	3.7	7.1
Escaños (89)	31	45	6	7	0	0

*Datos procedentes del escrutinio de 94 mesas escogidas
Proyección a las 22 horas 52 min*

	PP	PSOE	EU	UV	UPV	Otr
% votos válidos	43.0	33.4	12.4	7.2	2.8	1.1
Desviaciones	0.8	0.8	0.9	0.4	0.8	0.3
Escaños (89)	42	32	10	5	0	0
0.20	42	32	10	5	0	0
0.13	42	31	11	5	0	0
0.11	41	32	11	5	0	0
0.09	41	33	10	5	0	0
0.08	43	31	10	5	0	0
0.08	42	33	9	5	0	0
0.07	43	32	9	5	0	0
0.03	41	31	12	5	0	0
0.03	40	33	11	5	0	0
0.02	41	34	9	5	0	0

Distribución de diputados por partidos

PP	40	41	42	43	44
	0.05	0.28	0.46	0.20	0.02
PSOE	30	31	32	33	34
	0.03	0.26	0.42	0.24	0.04
EU	8	9	10	11	12
	0.03	0.18	0.42	0.30	0.06
UV	4	5	6		
	0.06	0.94	0.01		

Figure 2.

Parties	PP	PSOE	EU	UV	
Exit poll (14h29)	44.0±1.3 45	30.9±1.2 30	12.6±0.7 10	6.1±1.1 4	$p = 0.05$
Representative sections (22h52)	43.0±0.8 42	33.4±0.8 32	12.4±0.9 10	7.2±0.4 5	$p = 0.20$
First 77% scrutinized (23h58)	43.80±0.40 42	34.21±0.20 32	11.74±0.04 10	6.77±0.04 5	$p = 0.45$
First 91% scrutinized (00h53)	43.47±0.32 42	34.28±0.17 32	11.69±0.02 10	6.96±0.03 5	$p = 1.00$
Final	43.3 42	34.2 32	11.6 10	7.0 5	

Table1.3