Chile's Popular Unity Government in the Headlines

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Abstract

We analyze newspaper headlines from two crucial junctures during Chile's Popular Unity (UP) Government, the 1972 truck driver's strike and the 1973 debate over establishing a Unified National School (ENU). We find a one dimensional spatial structure in which the newspapers were highly polarized using an ideologically charged vocabulary. Sparse Factor Analysis (SFA) reveals strong evidence in favor of a single dimension, while WordFish provides similar results with regards to the structure of that dimension.

Introduction

Newspaper headlines synopsize what editors believe will draw public attention. The editor seeks to summarize in few words the characteristics of an article that will draw in readers. In a spatially polarized environment, a significant part of what editors seek to communicate will be the ideological slant of the articles they offer to the public (Gentzkow and Shapiro, 2006). In this analysis we seek to extract the spatial structure of the Allende era readership the editors catered to.

We analyze headlines pertaining to two episodes during the last year of Chile's Popular Unity (UP) Government, a nationwide truckers' strike in October and November of 1972 which spread to other areas, and the national debate that ensued when the UP Government announced its plan to create a Unified National School (ENU). We find that for both episodes there is strong evidence for a one dimensional spatial structure, with newspapers using polarized vocabulary that aligns with a more general left to right dimension. Working with stemmed terms, we find that "worker" and "front" come out consistently on the left, while "national" is uniformly on the right.

Yet even in our rarefied sample of two highly contentious events taking place in a profoundly polarized polity, the substantive context was sufficiently important to switch the political polarity of some terms–during the truckers' strike "support" (in that case for the anti-government strike) was imbued with right leaning ideological content, while "reject" (meaning not supporting the strike) was infused with connotations of the left. During the ENU debate the polarity of these words reversed, with "support" (for the government's ENU proposal) taking on the ideological coloration of the left, while "reject" radiating the ideological hues of the right.

With the exception of two dailies during the ENU debates, all of the newspapers we analyze take on a significant ideological polarity in the episodes we analyze. There is a commonly held view that the press during the UP era were a source of instability and polarization, seeking to lead the public into more radicalized and uncompromising positions, see for example Bernedo and Porath (2003). Yet we observe significant differences across the ideological spectrum, indicating the papers were catering to different readership niches. Consistently with Gentzkow and Shapiro (2010) who show in their sample of US broadsheets that readers' leanings have a bigger impact on the tilt of newspaper coverage than has the ownership of a paper, we find that the three newspapers owned by the Edwards family staked out distinct ideological terrain, all three on the right, but at distinct levels of polarization.

Our methodology, Sparse Factor Analysis (SFA) (Kim, Londregan and Ratkovic, 2018), allows us to recover the spatial structure of each of our two *corpora* while comping with the issues of "zero inflation" that complicate the application of the Poisson based WordFish estimator (Slapin and Proksch, 2003). The SFA estimator also allows us to estimate the number of dimensions, rather than having to assume it, and it is more stable when confronted with low word counts than is the bootstrapping procedure used to estimate parameter uncertainty in the WordFish estimator. While both SFA and WordFish are spatially oriented models, Topic models, including Latent Dirlichet Analysis (LDA) (Blei, Ng and Jordan, 2003), and Structural Topic Models (STM) (Lucas et al., 2015), ask and answer a different question. Topic models look at the diversity of the subject matter, *e.g.* differentiating between articles about education and those dealing with labor unrest in the transportation sector. We apply topic models to verify whether our headline data constitute substantively homogeneous *corpus* for each episode we consider. We then use SFA to examine the spatial structure or each *corpus*.

1 Polarized Discourse in Allende's Chile

We look at the press coverage of the UP period in Chile as a way to probe what text as data methods can add to our understanding of an important political juncture. We chose this juncture confident that our *corpora* dealt with ideologically polarizing content, so as a methodological exercises, we are confident that there is an interesting structure for our estimator to confront. At the same time, this is a period that has primarily been studied using qualitative methods, and we hoped that our estimator would provide some useful evidence about the strength of the ideological signal encountered in the newspapers of the era.

The two events we chose, the Trucker's Strike and the ENU debate differ, in that the strike is more of a classic substantive news event, with objective facts to report, including work stoppages, food scarcity, arrests of guild leaders, and confiscations of trucks providing fodder for reams of coverage by even the most objective journalist. In contrast, the ENU dealt with a plan that had yet to be implemented. Beyond reproducing the proposal set forth by the Ministry of Education (MinEduc) and reporting which groups had voiced approval or rejection of the proposal, the press had little grist to mill into objective coverage, so that most of the discussion on all sides consisted of speculation about the consequences of the proposal. Yet dispite their differences, both cases involved the UP implementing it's campaign promise to travel the "Chilean road to Socialism", including requisitioning trucks, and supplanting private education.

The Truckers' Strike

When the UP announced it would form a state enterprise to provide truck transportation in the southern region of Aysén, the Aysén trucker's guild[1] responded by declaring a work stoppage[2]. The National Federation, headed by León Vilarín backed the local chapter, calling for a national strike to start on October 9, 1972. The government responded, invoking national security provisions in the law to arrest Vilarín and other strike leaders, while it began confiscating the trucks of strike participants. The small business association, headed by Rafael Cumsille soon joined the strike, as did others, from taxi drivers, to doctors, to

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[1]The *Federación del Transporte Terestre de Aysén.*

[2]For a more extensive discussion of the strike and its consequences, see Fermandois Huerta (2013) pp.565-578.

pilots for the national airline. This panoply of events generated ample press coverage from newspapers crossing the ideological spectrum.

The government and its backers found themselves in an awkward position. Normally the left support and participate in strikes, but this one was directed against the UP government, which included the Communist and Socialist Parties. Also, the epicenter of the strike consisted of truck owners. However, this was not the face of Kennacott Copper, an unpopular foreign mining company which the government had recently expropriated. The striking truck proprietors were typically owners of but one rig, or perhaps two or three. These were middle class individuals, many of whom had started out as drivers for hire, families who had saved for years to buy their own rig. Moreover, the drivers for hire mostly sided with the small proprietors. As the strike wore on the leaders refused to post bail, eventually embarrassing the government into releasing them, while shortages of everything began to mount. There is the perennial question of whether secret US funding brought about the strike, something newspapers on the left alleged at the time. There was indeed some clandestine support by the US for Anti-UP activists[3], none of which made the strike any less newsworthy!

On the weekend of November 4 and 5 the government brought several military officers into the cabinet, including Carlos Prats, head of the Chilean Equivalent of the Joint Chiefs of Staff, while it reached a settlement with the truckers, and transportation services resumed during the first days of the following week. Meanwhile, other groups, from the small shopkeepers, to employees of the state bank, to the airline pilots, remained on strike. Moreover, there were widespread cases of reprisals taken against workers in the aftermath of the strike. Gradually the other strikes came to and end, and by late November the strike was history.

The UP government and the truck drivers would confront one another again the following Summer, and many people regard the truck drivers' strike as a key moment at which the UP's opponents galvanized into action against the government. The Allende government continued in power for another nine months, and the coalition of UP supporters went on to make a respectable second place showing in the March 1973 Congressional elections, leaving the political system in gridlock. Allende responded by making increasing use of executive initiatives, including a proposed reform of the education system.

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[3]Though Fermandois Huerta (2013) cites Gustafson (2007), and Harmer (2011) contending the quantities involved are an order of magnitude too small to have sustained the work stoppages without the committed support of strike participants.

The ENU

Education has been a perennial issue in Chilean politics for well over a century. The conflict between secular and ecclesiastic education was an important element of the nineteenth century conflict between liberals and conservatives, and in the mid twentieth century the government of Radical Party president Carlos Ibañez del Campo embarked on a massive campaign of school construction that brought basic education to even Chileans of humble means.

Education was again a central element of the political campaign of 1970 that brought Salvador Allende to the presidency. The UP manifesto for that election foreshadowed the ENU with its pledge to

> ...make the planning of education and the **unique national democratic school** a reality, the new State will take private establishments under it's responsibility, starting with those places that select their student body on the basis of social class, national origin or religious faith[4] Farías (2000) 123–6, quoted in Fermandois Huerta (2013) p.292.

Education was then overshadowed by other elements of the UP agenda until, on February 5, 1973 Salvador Allende reactivated discussion of the ENU. This speech was followed by an Education Ministry white paper Minesterio de Educación (1973) outlining a proposed reorganization of education as part of a project to reconfigure society along socialist lines.

There ensued a sharp debate, with ample press coverage and discussion during March and April. The position of the Catholic bishops solidified in opposition to the ENU, at least in it's current form, with the more moderate opponents asking for it to be changed, while more adamant opponents, such as Bishop Emilio Tagle voicing more categorical rejection of the idea. On April 13 Education Minister Jorge Tapia announced that the MinEduc would not implement the proposed reform that year[5]. We now know that the ENU proposal galvanized opposition to the UP government among junior military officers, who had previously held more ambivalent views of the UP, a development with disastrous consequences later in the year for the Allende and his government.

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[4]The original: "hacer realidad la planificación de la educación y **la escuela única nacional y democratica**, (para lo cual) el nuevo Estado tomará bajo su responsabilidad los establecimientos privados empezando por aquellos planteles que seleccionan su alumnado por razones de clase social, origen nacional o confesión religiosa."

[5]The Chilean school year runs from March until December.

As the first semester of the 1973 academic year came to a close the UP once again revived discussion of the ENU, and even sought to conduct a national opinion poll to legitimize a renewed resolve to implement the ENU by executive order. The ENU once gain erupted into the headlines. How the matter would have ended absent the coup of September 11 is something we will never know. As matters transpired, discussion of the ENU came to an abrupt halt with the military overthrow of the UP, and in short order the military government put an end to the free press, as it deactivated MinEduc's plans for the coming school year.

2   Newspaper Data

To understand better the 1973 agon between the UP and its opponents we turn to the newspaper archives at the Chilean Library of Congress (BCN). Selecting articles categorized by the BCN as relevant to the the two episodes that are our focus, we use a topic model (Lucas et al., 2015) to check whether the collection of articles we analyze for a given episode does in fact form a substantively homogeneous corpus.

2.1   The Truckers' Strike *Corpus*

The *corpus* consists of $2,760$ headlines published in October, 1972, and 695 that saw light in November of the same year. The distribution across periodicals is as follows:

Table 1: Distribution of the $3,455$ Newspaper Articles in the ENU *Corpus*

Newspaper	#	Newspaper	#	Newspaper	#
La Prensa	576	**Las Últimas Noticias**	179	Ercilla	5
El Siglo	444	**Noticias de la Última Hora**	175	Vea	5
El Mercurio	422	**La Segunda**	158	SEPA	5
Tercera de Hora	351	**Posición**	26	Patria y Libertad	4
La Tribuna	307	Chile Hoy	9	PEC	4
Puro Chile	291	El Rebelde Mir	8	Punto Final	4
La Nación	271	La Aurora de Chile	7	Qué Pasa	3
Clarín	194	Mayoría	6	Plan	3

While there are a number of monthly periodicals on this list, they contribute but a handful of articles each. To avoid unstable parameter estimates provoked by the idiosyncrasies of particular issues, we limit our sample to papers that contribute at least 25 headlines to the corpus, this leaves us with $3,394$ headlines, about 98.2% of the original sample, encompassing the 12 newspapers whose names appear in bold font in the table 1.

Typical headlines include "Popular Mobilization and Government firmness to crush the seditious offensive"[6] from the Communist Daily *El Siglo*, or "Conflict between Government and Guilds[7] from the prominent newspaper *El Mercurio*, well known for its opposition to the UP.

2.2   The ENU *Corpus*

We work with 635 newspaper headlines grouped under the rubric of the ENU. These articles appeared in 23 newspapers[8] during 1973, with the vast bulk of the *corpus* generated during March and April:

Table 2: Articles in the ENU *Corpus* by Month

Month	Number of Articles	Month	Number of Articles	Month	Number of Articles
January	4	May	37	September	0
February	8	June	9	October	6
March	314	July	43	November	1
April	201	August	12	December	0

The different papers were far from being equally prolific, with the Santiago daily *El Mercurio* accounting for more than a quarter of the entire *corpus*, while the news magazine *Vea* contributed but a single article. *El Mercurio* is universally regarded as having opposed the UP government in general, and it's ENU policy in particular, while at the time *La Nación* was under the direct control of the government, and so provides a reliable pro-UP benchmark. We eliminate the clippings from sources that contribute fewer than 25 headlines, leaving us with a sample of size 535, consisting of headlines from the papers with bolded names in the accompanying table.

As with the truckers' strike *corpus*, we recovered the text of each headline, the date it was published, as well as the page and column number for the article. Examples include "It's necessary to Support the 'ENU', says the MIR."[9], where "MIR" refers to the hard left "Independent Revolutionary Movement", and this from *El Mercurio*: "A.F. Schools will receive students *concientizados* in the ENU–affirms Senator Juan de Dios Carmoa"[10], where

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[6] "Movilizacin popular y firmeza del Gobierno para aplastar ofensiva sediciosa" *El Siglo* 14 October 1972, page 2.
[7] "Conflicto entre Gobierno y Gremios" *El Mercurio* 18 October 1972, page 8.
[8] The source of one of the articles is unknown.
[9] "Hay que apoyar la 'ENU', dice el MIR" *Clarín*, 30 March page 6.
[10] "Escuelas de las FF.AA. recibirn estudiantes concientizados en ENU–afirma el Senador Juan de Dios Carmona", *El Mercurio* 5 April 1973 page 19.

Table 3: Distribution of the 635 Newspaper Articles in the ENU *Corpus*

Newspaper	#	Newspaper	#	Newspaper	#
El Mercurio	177	Noticias de la Última Hora	18	Punto Final	3
Tercera de Hora	94	Clarín	18	El Rebelde Mir	2
La Prensa	73	La Segunda	17	Politica y Espritu	2
La Nación	62	PEC	13	Chile Hoy	2
La Tribuna	38	Ercilla	8	Testimonio Izquierda	2
Puro Chile	33	Patria y Libertad	5	Mensaje	2
Las Últimas Noticias	32	Qué Pasa	3	Vea	1
El Siglo	26	Plan	3	unknown	1

the "A.F." abbreviates "Armed Forces", while *concientizados* is somewhat more fraught than "sensitized" but a bit less severe than "brainwashed".

Pre-Processing

Before applying an estimator to the data we first use the **tm** text processor of Roberts, Stewart, and Tingley to remove punctuation, whitespace, numbers, and Spanish language stopwords, we use the same package to "stem" the Spanish text, while to diminish the danger of "over fitting" we remove sparse terms that are entirely absent from at least 3 of the newspapers in our *corpus*. This leaves us with a document term matrix of newspaper titles. We are well aware of the cogent advise offered by Denny and Spirling (2018) for checking the robustness of a *corpus* to different pre-processing decisions, but we do not believe that punctuation, whitespace, numbers or stopwords would provide useful discrimination among newspaper headlines, while we do believe it's important to "stem" the terms in our analysis, so that pairs of words such as "concientización" and "conscientizar"[11] are recognized as referring to the same concept would weaken our analysis. In so doing, we place ourselves in Denny and Spirling's category of analysts with a strong theoretical preference for our pre-processing decisions.

After eliminating periodicals with contributing fewer than 25 headlines, our truckers' strike *corpus* consists of 3,394 headlines from 12 publications. Treating the headlines from each publication as a "document", we applied the tm R package (Feinerer, Hornik and Meyer, 2008) using it to remove punctuation, white space, and numbers, and Spanish language stopwords, and we used it to stem Spanish words. To avoid overfitting hapaxes and idiosyncratic quirks of particular editors from we remove terms absent from at least 60% of

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[11]As noted earlier, these mean, roughly, 'indoctrination', and 'to indoctrinate'.

documents. We have experimented with other frequency thresholds, and variation between 20% and 80% doesn't appear to have much of an effect on our substantive conclusions. This leaves us with a text document matrix consisting of 558 terms and 12 "documents", each of which corresponds to the headlines appearing in a particular periodical.

We followed a parallel process for the much smaller ENU *corpus*. Eliminating periodicals that provided fewer than 25 headlines left us with 8 publications, and 535 headlines, preprocessing as we did for the truckers' strike *corpus* left us with a text document matrix consisting of 54 terms and 8 "documents".

Homogeneity of the Truck Strike and ENU *Corpora*

Analysts emphasize the importance of working with substantively homogeneous *corpora* when estimating a spatial model, confining attention to narrowly focused text, such as legislative debate on a particular piece of legislation (Harzog and Benoit, 2015; Schwarz, Traber and Benoit, 2017). This avoids conflating variation in vocabulary across substantively distinct subjects with differences in ideological orientation toward the same subject matter.

While we work with newspaper headlines that syopsize what editors contemporary with the UP thought were the essential elements of each article, and while we have done our best to assemble relevant headlines, we would like to further assure ourselves that we are actually dealing with a coherent *corpus* of headlines relevant to our two episodes; the truckers' strike and the ENU.

To probe more deeply the substantive content of the headlines, we apply Structural Topic Models (STM) (Lucas et al., 2015) to each body of headlines. The stm model compels us to choose a number of topics *a priori*, and we settle on 20 as an ample number. When we fit the model to the headlines from the trucker's strike we obtain the topics whose frequencies and emblematic vocabulary are depicted in figure 1. Notice that "par-" the stem for *paro*, the Spanish word for "work stoppage" [12] is the most frequent word in all but one of the top eleven topics, which account for most of the text. Add in "gobiern", "trabaj", and "comerci", stems for, respectively, "government", "worker", and "commerce", and one has the bulk of the most frequent terms in the most prevalent topics. The average correlation among word frequencies across all parings of the eleven common topics in these data is 0.680. While

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[12]The Spanish for "strike" is *heulga*, but the trucker's strike was strictly speaking a work stoppage, as correctly characterized by the press.

topic models will always find as many topics as one asks for, when applied to homogeneous texts, the result will be a tapestry woven of gray threads, with each of the prevalent topics resembling the others, just as we find here.
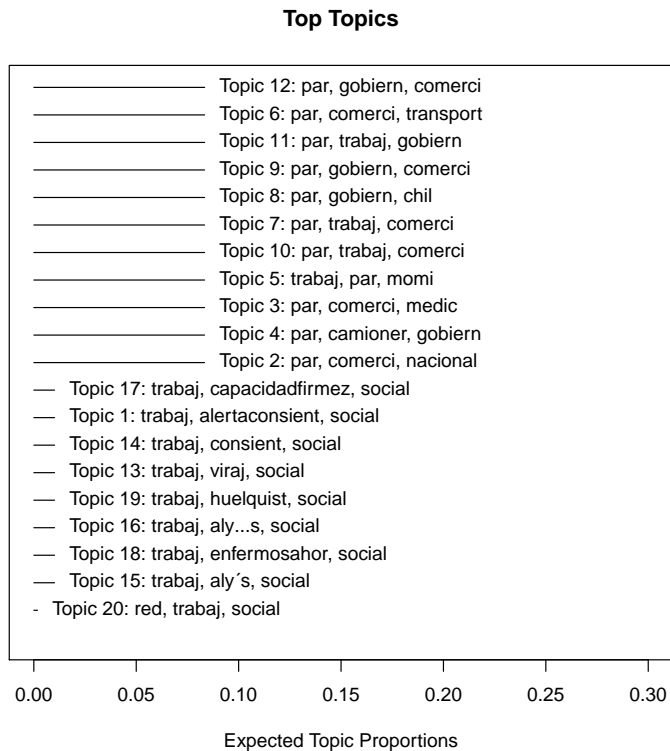
Top Topics

Figure 1: Truckers' Strike Topics

When we turn our attention to the ENU *corpus* the story is very similar. Results from the **stm** model are shown in figure 2. Again the most frequent words appear across topics as some permutation of *ENU, nacional, escuel, unific,* the latter two being stems for "school", "unified", while *nacional* is the Spanish word for "national". Calculated among the top five topics, the average pairwise correlation of word frequencies is 0.700. Again we find ourselves confronted by a fabric woven of monochrome verbal thread. This is precisely the sort of substantive homogeneity that we seek in order to estimate the spatial characteristics of the political landscape.
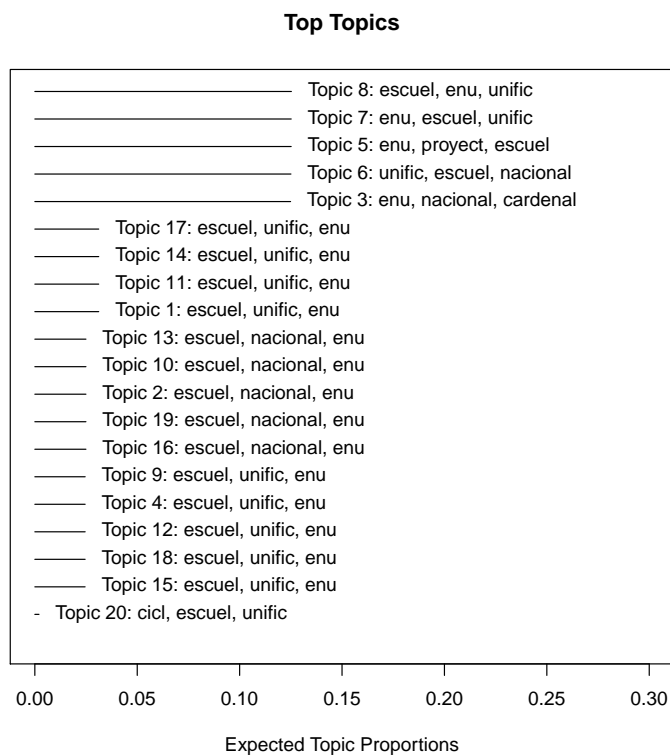
10

Top Topics

Figure 2: ENU Topics

3 Results

The Truck Drivers' Strike

Working with our corpus of **558** terms and **12** documents we applied the SFA model of Kim, Londregan and Ratkovic (2018). This is a spatial model of word use estimated by Bayesian methods. It gives us posterior probabilities on the lower bound on the number of spatial dimensions in ideological play. It is possible for this number to be zero–papers might simply differ in their degree of verbosity, or differ in non-spatial terms, with each using an idiosyncratic vocabulary. Here we find strong evidence that spatial characteristics do matter. Table **??**) reports lower bounds on the posterior probability that the number of dimensions at work in the truck drivers' strike *corpus*, $\tilde{\mathrm{d}}$ is at least as great as a given lower bound.

The posterior density indicates there is a very high probability, **0.963**, that there is a spatial element to the truck driver's *corpus* while there is only a **0.300** that there are three or more dimensions. We are therefore left with a strong indication there is at least one spatial

Table 4: Dimensionality of the Truckers' Strike *Corpus*

d	$\Pr\{\tilde{d} \geq d\}$	d	$\Pr\{\tilde{d} \geq d\}$	d	$\Pr\{\tilde{d} \geq d\}$	d	$\Pr\{\tilde{d} \geq d\}$
1	0.963	4	0.193	7	0.116	10	0.063
2	0.635	5	0.161	8	0.097	11	0.051
3	0.300	6	0.136	9	0.078	12	0.000

dimension in play, with the possibility of a second as well.

Estimates of the first dimension spatial preference parameters for language use by the periodicals, x, from the SFA model appear in table 5. Perhaps the most remarkable feature of these estimates is the gulf between the 95% credible interval encapsulating *Posición*, and the corresponding credible interval for the Edwards family daily paper *La Segnunda* the estimated gap is almost a quarter of the range between the two most extreme estimated locations, for the Communist daily *El Siglo* and the stalwart UP opponent *El Mercurio*. To the left of this gulf the news outlets divide into two clumps, the more extreme, with credible intervals that barely overlap, consists of *El Siglo* and the Socialist owned *Clarín*. Less extreme is the group of papers consisting of *Puro Chile*[13], *Noticias de la Última Hora*, *Posición*, and the government paper *La Nación*. Moving from left to right through this group, we see that the credible interval for each paper overlaps with that if it's neighbor.

On the righthand side of the gulf, moving from moderate to more extreme, we encounter *La Segunda*, owned by the Edwards family, *La Tribuna*, run by the opposition National Party, *Las Últimas Noticias*, another Edwards family paper, *Tercera de la Hora*, owned by the Picó family, charcterized by Bernedo and Porath (2003) as part of the "moderate opposition to Allende". Moving farther rightward, we encounter *La Prensa*, the newspaper of the Christian Democratic Party of Chile, which by October of 1972 had joined the Opposition to the UP, and *El Mercurio*, the flagship of the Edwards family's fleet of newspapers.

Among the papers on the right, only the credible intervals for *La Tribuna* and *Las Últimas Noticias* actually overlap. While the extreme position of *El Mercurio* is consistent with the well known mutual enmity between the opposition daily and the UP, and the extreme location for the Communist *El Siglo* is also unsurprising, the relative position of some of the other papers is of some interest. The National Party outlet, *La Tribuna* scales as being surprisingly moderate, while the Christian Democratic daily, *La Prensa* is second to none but *El Mercurio* in the stridency of the political rhetoric it deploys through the headlines. This latter finding

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[13]Bernedo and Porath (2003) classify *Puro Chile* as a tabloid paper that represented the Socialist position.

Table 5: Estimated ideological leanings of periodicals in the Truckers' Strike *Corpus*

Periodical	$x_{0.025}$	$\hat{x}$	$x_{0.975}$	$x_{0.975} - x_{0.025}$
El Siglo	-1.276	-1.201	-1.125	0.151
Clarín	-1.143	-1.081	-1.022	0.120
Puro Chile	-0.944	-0.887	-0.830	0.113
La Nación	-0.897	-0.839	-0.780	0.116
Noticias de la Última Hora	-0.730	-0.661	-0.595	0.134
Posición	-0.738	-0.610	-0.480	0.257
La Segunda	0.197	0.282	0.370	0.172
La Tribuna	0.490	0.556	0.623	0.132
Las Últimas Noticias	0.486	0.565	0.646	0.160
Tercera de la Hora	0.845	0.902	0.958	0.112
La Prensa	1.315	1.375	1.436	0.120
El Mercurio	1.566	1.628	1.692	0.125

is a bit surprising, given it was the Christian Democrats' presidential candidate, Rodomiro Tomic, whose support in Congress enabled Allende to win the presidential election. While it is well known that the PDC went into opposition, running a joint list of candidates in March 1973, the ideologically extreme nature of the PFC newspaper is a surprise.

Note that the Edwards family papers did not promote the same ideological agenda, *La Segundo* was the most moderate paper on the right of the political spectrum, while *El Mercurio* was the most extreme. While this seems at odds with the view that the Edwards family used its newspaper holdings to move public opinion against the UP, it is consistent with the finding by Gentzkow and Shapiro (2006) that in the US the ideological tilt of the readers was a better predictor than the owner's identity in predicting a US newspaper's ideological leanings. Our estimates indicate that the Edwards family papers were not all pushing the public toward the same set of issue positions. Instead of striving to lead public opinion against the Allende government, the Edwards family papers appear to have been working to provide the news tilt their disparate blocks of readers wanted.

The SFA model also returns estimates of the ideological content of headline terms, g, the most extreme values of which we report in table 6[14]. We observe a mixture of words that resonate with a general left *vs* right spectrum, and specialized words relevant to the truckers' strike in particular. Thus on the left we encounter terms related to class conflict, such as "*trabaĵ*" and "*puebl*", stems for "workers" and "people" respectively, as well as "*momĩ*", the stem for "*momio*", Spanish for "mummy"–an all purpose epithet hurled by the left of the UP

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[14]For a full list of terms whose 95% credible intervals do not encompass 0, see the Appendix.

Table 6: Estimated ideological content of extreme terms in the Truckers' Strike *Corpus*

Terms	$g_{0.025}$	$\hat{g}$	$g_{0.975}$	$g_{0.975} - g_{0.025}$
trabaj	-4.239	-4.30	-3.823	0.415
momi	-3.932	-3.640	-3.413	0.518
patriot	-3.936	-3.630	-3.398	0.538
puebl	-3.384	-3.204	-3.040	0.343
normal	-3.214	-3.020	-2.827	0.387
sedici	-3.267	-2.988	-2.774	0.493
voluntari	-3.305	-2.914	-2.589	0.716
empresari	-3.223	-2.900	-2.625	0.597
$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$
gremial	2.583	2.725	2.884	0.300
indefin	2.519	2.785	3.108	0.589
represali	2.618	2.803	3.025	0.407
dirigent	3.73	3.196	3.340	0.267
nacional	3.313	3.443	3.577	0.263
transport	3.417	3.576	3.743	0.325
gremi	4.629	4.804	4.999	0.369

era at political conservatives. Likewise, we see "*nacional*", Spanish for "national", a theme often invoked by the right. Interestingly, the left and the right sometimes use different words for the same thing–for example business leaders are "*empresarios*" ("entrepreneurs") to the left, while they are "*diregentes*" ("directors") for the right. The two sides also used different words for the truckers–"*camioneros*" to the left, they were "*transportistas*" to the political right.

Side by side with these general terms from the left to right ideological spectrum, we observe vocabulary specific to the strike. Thus the left spoke of the strike as "*sedicioso*", "seditious", while strike breakers while "*partriotas*", and "volunteers". The left sought to minimize the impact of the stoppage, so that daily life was going on as "*normal*". In contrast, the right made use of words stemming to "*gremi*" and '*gremial*', references to the truckers guild, while in the argot of the right, the strike would go on "indefinitely", corresponding with the stem "*indefin*". After the truck drivers and sympathy strikers started going back to work, the right complained of widespread *represalias* ("reprisals") against former strikers, stemmed as "*represali*".

SFA suggested the possible existence of a second dimension of spatial preferences, but without exception, the posterior credible intervals for each and every x and g parameter bracket zero. Thus, despite the suggestion of a potential second spatial dimension at work, perhaps one that differentiates tabloid papers from those aimed at a less sensationalist mar-

ket, the posterior densities over these parameters are far too diffuse to speak about the nature of the second dimension, let alone it's content. The data are consistent with the existence of a single ideological dimension, linked to the recurrent left *vs* right themes emphasizing class conflict on the left, and nationalism on the right.

The ENU

A half a year after the truckers' strike, the ENU debate reflects the continued polarization of the press. After Allende's February 5, 1974 speech, MinEduc began a serious discussion of how the package of school reforms would be implemented, leading to a rash of coverage during March and the first half of April. Applying the SFA estimator to the ENU *corpus* we again get a posterior distribution over the number of dimensions, see table 7:

Table 7: Dimensionality of the ENU *Corpus*

d	$\Pr\{\tilde{d} \geq d\}$	d	$\Pr\{\tilde{d} \geq d\}$	d	$\Pr\{\tilde{d} \geq d\}$	d	$\Pr\{\tilde{d} \geq d\}$
1	0.853	3	0.259	5	0.070	7	0.001
2	0.475	4	0.140	6	0.021	8	0.000

These posterior probabilities are a bit smaller than for the truckers' strike *corpus*, perhaps reflecting the smaller data set, and partly as a result of the SFA sparseness prior that "tries" *not* to find spatial parameters. In any event, there is a high probability of at least one dimension, and a modest probability that there are three or more–leaving us, as in the case of the truckers' strike, to suspect there are one or perhaps two spatial dimensions at work in our data.

Posteriors for the estimated newspaper preference parameters corresponding to the first dimension, x, reported in table 8.

Table 8: Estimated ideological leanings of periodicals in the ENU *Corpus*

Periodical	$x_{0.025}$	$\hat{x}$	$x_{0.975}$	$x_{0.975} - x_{0.025}$
El Siglo	-1.262	-1.095	-0.944	0.317
Puro Chile	-1.106	-0.916	-0.742	0.363
La Nación	-1.120	-0.904	-0.713	0.406
La Tribuna	-0.553	-0.241	0.135	0.688
Las Últimas Noticias	-0.023	0.204	0.465	0.488
Tercera de la Hora	0.547	0.750	0.978	0.431
La Prensa	0.828	0.969	1.125	0.296
El Mercurio	1.340	1.561	1.741	0.401

The 95% credible intervals are wider than for the corresponding truckers' strike parameters, and so it is perhaps no surprise that they have a greater tendency to overlap. Recall that we have over six times as many headlines, and ten times as many terms for the truckers' strike! That said, we observe a group of papers at the left edge of the spectrum, including the Communist daily *El Siglo*, as well as *Puro Chile*, and the government organ *La Nación*. Other papers, such as *Clarín, Noticias de la Última Hora*, and *La Segunda* contributed too few headlines to be included in our *corpus*. *El Mercurio* remains in a class by itself, anchoring the right edge of the spectrum, while *La Tercera* and *La Prensa* occupy a somewhat less strident position, still clearly on the right. Posteriors for the dailies *La Tribuna* and *Las Últimas Noticias* suggest that those papers took a more neutral position on the ENU.

These estimates are largely consistent with one's expectations, that Bernedo and Porath (2003) argue that *El Mercurio* was the 'serious' newspaper of the right, while *Las Últimas Noticias* and *La Tribuna* were right leaning papers engaged in "popular combat". Bernedo and Porath count *Tercera de la Hora* as forming part of the "moderate opposition" to Allende, yet both the SFA here we find the partisan leanings of the headlines for this paper are indistinguishable from those of *El Mercurio* and the two "combat" papers *Las Últimas Noticias* and *La Tribuna*. We believe that this stems from two related causes, firstly our *corpus* pertains to the final year of the UP government, at a time in which even moderates became more polarized, and secondly, the ENU tended to provoke moderate opponents of the UP toward more extreme rejection of the Allende government.

These findings are consistent with the hypothesis that newspapers cater to the biases of their readership, rather than trying to lead–*La Tribuna* was owned by friends of the opposition National Party, whose legislators were amply quoted in the pages of *El Mercurio* as they stridently opposed the ENU, yet *La Tribuna* appears to have taken a more neutral stance, possibly reflecting the position of its readers. Likewise, the two papers owned by the Edwards family that contributed enough headlines to be included in the *corpus* took very different positions–*Las Últimas Noticias* was *hors de combat* in the ENU controversy, taking a very tepid centrist position, while *El Mercurio* defined the right edge of the spectrum. On the other hand, it is noteworthy that *El Mercurio* paid as much attention to the issue as it did, with headlines touting every school, student group, and politician who came out against the ENU. This may simply have been an effort to tilt toward their readers' biases, but it might also reflect an effort to influence public opinion, rather than to merely cater to it.

Table 9: Estimated ideological content of extreme terms in the ENU *Corpus*

Terms	$g_{0.025}$	$\hat{g}$	$g_{0.975}$	$g_{0.975} - g_{0.025}$
ivan	-2.054	-1.666	-1.336	0.717
apoy	-1.836	-1.473	-1.145	0.691
nuez	-1.846	-1.438	-1.109	0.737
secundari	-1.526	-1.084	-0.722	0.804
trabaj	-1.460	-1.075	-0.751	0.709
$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$
iglesi	0.756	1.159	1.729	0.972
unific	0.856	1.166	1.426	0.569
enu	1.792	1.945	2.097	0.304
proyect	2.714	3.018	3.390	0.676
rechaz	2.836	3.102	3.408	0.572

Table reports the estimated ideological content of the more extreme terms in the ENU *corpus*[15]. On the left we see the perennial "*trabaj*", the Spanish stem corresponding to "workers", and a set of terms related to the ENU, including Ivan Nuñez, the name of the Education Superintendent, *secordari*, the stem corresponding to secondary schools, and *apoy*, the root for the Spanish word for "support"–the papers on the left emphasized reports of community groups, politicians, and just about anyone else who was willing to pronounce in favor of the ENU.

The most ideologically charged terms on the right were all specific to the ENU theme–including references to the ENU itself–*enu*, *unific*. Just as the left sought to emphasize support for the project, so the right emphasized opposition, with *rechaz*, the Spanish stem for "reject" rising high on the list of terms with ideological content on the right. Papers on the right also emphasized that the ENU was not yet a *fait acompli*, hence the stem *proyect*, the Spanish root for proposal. Opposition from clerics got lots of ink in the conservative press, as evinced by the presence of *iglesi*, the stem for "church", among the terms on the right.

As with the trucker's strike *corpus*, the SFA parameter estimates for the second ENU dimension are all diffuse, the 95% credible interval for every parameter pertaining to the second dimension brackets zero. Thus, a clear picture of a one dimensional structure emerges for the news coverage of the ENU, with strong similarities to the coverage we observe for the truckers strike. Many of the same ideologically charged terms emerge in both *corpora*; "worker" and "national", and the same newspapers bracket the spectrum, running from

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[15]For a full list of terms whose 95% credible intervals do not encompass 0, see the Appendix.

El Siglo on the left to *El Mercurio* on the right. Yet in each case, words specific to the controversy also took on ideological coloration. Notably, the stems for "support" and for "reject" switch ideological polarity between the two *corpora*, with the right supporting the truckers' work stoppage, and rejecting the ENU, while the left opposed the strike but they supported the ENU.

Polarization: The Trucker's Strike and the ENU Compared

At this juncture it would be convenient to compare our estimated polarization parameters across periods, but we have just seen that the polarity of some of our stemmed terms, *rechaz*, *apoy*, reverses between the two episodes, and the interpretation of the preference parameters depends on the context in which a document is generated. Recall that the probability periodical n uses term w is varies with $x_n g_w$. If we halve all the term parameters in a given *corpus*, while we double all the periodical parameters, we will end up with the same implied word usage:

$$\left(2 \times x_n\right) \times \left(\tfrac{1}{2} \times g_w\right) = 2 \times \tfrac{1}{2} \times x_n \times g_w = x_n \times g_w$$

An alternative is to normalize conditional on the relative positions of two documents, or of two terms. We can then ask how other periodicals have shifted relative to our newspapers of interest, and in order to learn a bit more about how the Truckers' Strike and ENU *corpora* compare, that is what we do here.

We are confident that the positions of *El Siglo*, the Communist Party daily, and of *El Mercurio* were both stable and extreme over the final year of the UP government, from October 1972 to September 1973. We renormalize the location of each periodical as follows: the normalized location of periodical p is:

$$\dot{x}_p = \frac{x_p - x_{Siglo}}{x_{Mercurio} - x_{Siglo}}$$

Substituting the location of *El Siglo* for x_p we get $\dot{x}_{Siglo} = 0$ on the left, while $\dot{x}_{Mercurio} = 1$. It is trivially easy to convert our draws from the posterior density over the preference parameters into a posterior over the normalized parameters. The results for the ENU corpus appear in table 10.

Table 10: Normalized Preference Parameters for periodicals in the ENU *Corpus*

Periodical	$\dot{x}_{0.025}$	mean $\dot{x}$	$\dot{x}_{0.975}$	$\dot{x}_{0.975} - \dot{x}_{0.025}$
El Siglo	0.000	0.000	0.000	0.000
Puro Chile	-0.037	0.067	0.162	0.200
La Nación	-0.035	0.070	0.158	0.193
La Tribuna	0.171	0.322	0.509	0.338
Las Últimas Noticias	0.377	0.490	0.623	0.246
Tercera de la Hora	0.593	0.696	0.819	0.226
La Prensa	0.690	0.778	0.882	0.192
El Mercurio	1.000	1.000	1.000	0.000

We can make similar calculations for the subset of Truckers' Strike periodicals that overlap with the periodicals from the ENU *corpus*. We now normalize using the truck strike parameters for *El Siglo* and *El Mercurio*. Table 11 summarizes the results.

Table 11: Normalized Preference Parameters for periodicals in the Trucker's Strike *Corpus*

Periodical	$\dot{x}_{0.025}$	mean $\dot{x}$	$\dot{x}_{0.975}$	$\dot{x}_{0.975} - \dot{x}_{0.025}$
El Siglo	0.000	0.000	0.000	0.000
Puro Chile	0.083	0.111	0.138	0.055
La Nación	0.010	0.128	0.154	0.054
La Tribuna	0.587	0.621	0.655	0.068
Las Últimas Noticias	0.586	0.624	0.663	0.078
Tercera de la Hora	0.712	0.744	0.773	0.061
La Prensa	0.878	0.911	0.943	0.065
El Mercurio	1.000	1.000	1.000	0.000

Notice how much narrower are the normalized credible intervals for the truckers' strike parameters when compared with the corresponding intervals from the ENU. The relative locations of the papers appear to be remarkably stable, save that the trucker's strike credible intervals for *La Tribuna* and *Las Últimas Noticias* are shifted closer to *El Mercurio* than are the corresponding parameters for the ENU *corpus*. In the case of *La Tribuna* the truckers strike and ENU credible intervals actually fail to overlap, while for *Las Últimas Noticias* the ENU interval is shifted left, but it still intersects the interval for the truckers' strike. *La Tercera* and *La Prensa* both move slightly leftward as well, when compared with the ENU *corpus*. There is a much smaller leftward shift between the truckers' strike and the ENU for *Puro Chile* and *La Nación*, such that in the ENU *corpus* both credible intervals encompass the normalized location for *El Siglo*. Of course the ENU credible intervals are much wider, a result of the smaller sample size.

In only one case, that of *La Tribuna*, do the truck strike and ENU credible intervals fail to intersect. There is a bit more that we can say. For the periodicals overlapping the two corpora, we can plot the cumulative densities for the ideological parameters. We note that if the parameters for the truck strike first order stochastically dominate the parameters for the ENU, it is evidence that the periodical's ENU slant was somewhat to the left of it's truck strike slant. This means that for any potential value one might choose the posterior probability of the truck strike parameter being to the right of that value is higher than is he corresponding posterior probability for the ENU parameter. This would manifest itself as the cumulative density function for the truck strike parameter lying everywhere below the cumulative density for the ENU, see Kim, Londregan and Ratkovic (2018) for further discussion and details on using first order stochastic dominance to compare Bayesian posterior distributions.
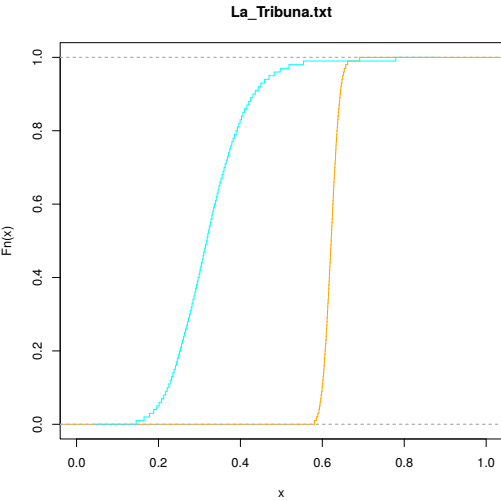

Figure 3: $x_{Tribuna}^{Paro}$ dominates $x_{Tribuna}^{ENU}$

Figure 3 compares the cumulative distribution function for the preference parameter of *La*

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Tribuna for the truck strike $\chi_{\text{Tribuna}}^{\text{Paro}}$ with the corresponding parameter in the ENU corpus; $\chi_{\text{Tribuna}}^{\text{ENU}}$. The cdf for the truck strike appears in orange, while the ENU cdf is rendered in cyan. One notes immediately that the cumulative density for the truck strike dominates the density for the ENU. This is the one parameter for which the 95% credible intervals for the two parameters exhibited no overlap whatsoever.

A comparison of the cumulative densities for the *Tercera de la Hora* preference parameters can be found in figure 4, there we see that the cummulative densities cross, so that neither preference parameter dominates the other. Graphs for the remaining periodical pairings appear at the end of the paper. There we see that the truck strike preference parameters for *La Prensa*, for *Las Últimas Noticias* and for the government paper *La Nación*, displayed respectively in figures 6, 7, and 9, all dominate the corresponding parameters for the ENU *corpus*, while the cumulative distributions for the preference parameters of *Puro Chile* cross, see figure 8.
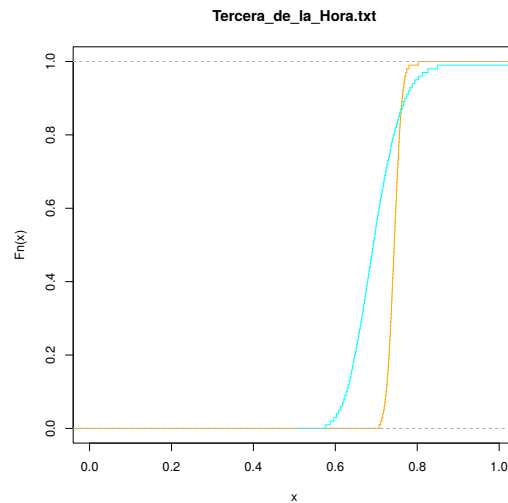

Figure 4: $\chi_{\text{Tercera}}^{\text{Paro}}$ does not dominate $\chi_{\text{Tercera}}^{\text{ENU}}$

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Here we observe three cases, *La Prensa*, *Las Últimas Noticias* and *La Nación*, for which the 95% credible intervals overlap, yet the truck strike parameter dominates the ENU parameter. We contend that this constitutes evidence that these papers shifted leftward between the truck strike coverage and the ENU debate, measured relative to our anchor periodicals *El Siglo* and *El Mercurio*. Our conclusion is not the result of a hypothesis test, but looking for non-overlapping credible intervals, while it has the flavor of fiduciary statistics, is not entirely in the spirit of Bayesian analysis. The first order stochastic dominance results are evidence of a leftward relative shift, and we should take this into account.

Left open in this analysis is the interesting substantive question of whether *La Tribuna*, *La Prensa*, *Las Últimas Noticias* and *La Nación* all shifted leftward, or whether our anchor paper on the right, *El Mercurio*, moved even farther rightward. Both changes would lead to the same qualitative behavior we observe for our more moderate papers. Of course, if a rightward shift of *El Mercurio* had been the only change, then, subject to estimation error, all of the other papers should move in exact proportion to one another, something the larger shift by *La Tribuna* suggests they did not do. But this pushes what we can say on the basis of a few thousand headlines to its limit, and perhaps just a bit beyond.

Robustness Checking: Word Fish

As an informal check on the robustness of our findings for the ENU we now turn to the WordFish estimator of Slapin and Proksch (2003). In order to implement their estimator, we need to normalize the scale by imposing locations for two newspapers. We chose the government controlled organ *La Nación* and the anti-UP *El Mercurio*, normalizing *La Nación* with a spatial preference parameter[16] of $\omega = -10$, while we impose a value of $\omega = 10$ for *El Mercurio*.

The WordFish estimator uses the bootstrap to calibrate uncertainty about the parameters, and this creates complications when dealing with discrete dependent variables–for some bootstrap *repliquées* the estimator obdurately fails to converge. For larger numbers of *repliquées* we found that we inevitably encountered at least one for which the estimator did not converge. In order to learn something about the robustness of our conclusions, we resample but 32 times, noting that Efron and Tibshirani (1993) defend the efficacy of even

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[16]Slapin and Proksch (2003) refer to their spatial preference parameters as ω, as opposed to x for SFA, while they style their term parameters as β instead of g, the corresponding symbol in the SFA rubric.

small numbers of *repliquées*. We remind the reader that this problem did not arise for the SFA estimator. The estimated preference parameters, styled ω in Word Fish, appear in table 12, along with the upper and lower two sided bootstrapped[17] confidence bounds:

Table 12: Estimated ideological leanings for each Paper in the ENU *Corpus*

Newspaper	$\omega_{0.025}$	$\hat{\omega}$	$\omega_{0.975}$
El Siglo	-57.459233	-10.755951	-4.7302649
La Nación	**-10.000000**	**-10.000000**	**-10.0000000**
Puro Chile	-86.688752	-9.691583	-0.4686046
Tercera de la Hora	9.008801	9.812158	10.2509319
Las Últimas Noticias	7.433925	9.815683	10.5834176
La Tribuna	8.310855	9.959899	10.9575324
El Mercurio	**10.000000**	**10.000000**	**10.0000000**
La Prensa	9.394984	10.363087	11.6460732

These results are qualitatively similar to the Bayesian posteriors emerging from the SFA analysis. Notice that the two reference papers, *La Nación* and *El Mercurio* are fixed at their respective normalized values of -10 and 10, while the two other newspapers on the left the Communist Party organ *El Siglo* and *Puro Chile*, have very wide confidence intervals which encompass the normalized location at -10 for *La Nación*, while neither confidence interval brackets zero–we can be confident that both papers, especially *Puro Chile*, are well to the left of center.

The remaining four un-normalized papers, *Tercera de la Hora*, *Las Últimas Noticias*, *La Tribuna* and *La Prensa* are all estimated to take positions on the right, and the locations for these papers are fairly precisely estimated, and all three cluster very closely to the reference paper on the right, *El Mercurio*. Compared with SFA, WordFish paints a highly bimodal picture of newspaper polarization.

What about the vocabulary? In contrast with SFA, which returns 17 words whose 95% credible intervals include only negative values, and 17 more whose credible intervals encompass only positive levels, the bootstrapped confidence intervals reveal that five are earn significantly negative estimates for the ideological position coefficient β at the $\alpha = 0.025$ level, while a sixth word stemmed as "**apoy**", the root for "apoyar", or *support*, nearly does so. We also estimate seven words as being significantly positive at $\alpha = 0.025$, see the following tab:

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[17] We used $\alpha = 0.95$.

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Table 13: Estimated ideological content for each term in the ENU *Corpus*

Newspaper	β_{LB}	$\hat{\beta}$	β_{UB}
ivan	-1.42698707	-0.120659572	-9.842825e-03
apoy	-0.62227654	-0.118034184	3.657623e-01
nuñez	-0.20057775	-0.100315484	-1.224333e-02
feses	-0.62440523	-0.084656095	-1.804215e-02
trabaj	-0.61598025	-0.080700101	-4.317169e-05
superintendent	-0.17032472	-0.065894029	-6.534572e-03
⋮	⋮	⋮	⋮
gobiern	0.01155796	0.079338546	1.439950e+00
rechaz	0.05788992	0.143461445	9.570237e-01
posicion	0.16863558	0.211033913	2.527264e+00
obisp	0.06650336	0.223636345	2.003890e+00
iglesi	0.14569989	0.225723183	1.612271e+00
concientiz	0.15552815	0.228131836	2.560878e+00
proyect	0.21987789	2.267262128	3.239970e+00

There is a great deal of overlap between the words identified by SFA as most extreme and those that are "significant" in the WordFish framework, including the stems *ivan*, *nu— nez*, *apoy*, and *trabaj*. The *superintendent* stem also pertains to MINEDUC Superintendent Ivan Nuñez[18] The *feses* stem corresponds to FESES (Federación de Estudiantes SEcodarios de Santiago), a student group on the right who were often involved in street violence and whose doings were frequently demonized in the left of center press. This term corresponds to a zero mode in the SFA estimates.

As with the most extreme SFA parameter estimates, we observe the stems *rechaz*, *proyect*, and *iglesi* on the right. The stem obisp, for the "bishop", is also identified by SFA as a word on the right[19], though it does not appear among the most extreme terms. Likewise, the term *gobiern*, which is among those whose 95% credible interval from SFA includes only positive values[20].

WordFish identifies *concientiz* as a term of the right. This is the stem for "concientización" and "conscientizar" reflecting the frequent assertion in the anti-UP press that rather than education the ENU was really the spear point of imposing "reeducation" in the Marxist sense, aimed less at technical or cognitive formation than it was at indoctrinating Chile's youth as part of a transition to a socialist society. This term shows up in the SFA estimates

[18]The SFA posterior over this term has a mean value of -1.024, and corresponds to a 95% credible interval covering the range $[-1.423, -0.699]$.
[19]The SFA posterior mean is 1.130, encompassing the range $[1.078, 1.000]$.
[20]The SFA posterior mean is 0.658, encompassing the range $[0.787, 1.570]$.

encased in an aura of greater ambiguity, with a 96% credible interval bracketing zero[21], though the posterior mean of 0.346 is on the right. The *posición* term found significant by Word Fish is likewise tagged as ambiguous by SFA.

While, WordFish comes with some idiosyncrasies–the bootstrap estimates sometimes fail to converge, the model faces the chronic problem of zero-inflation caused by the overabundance of hapaxes and other words used only a few times in the *corpus*, and it does not actually assess the number of ideological dimensions, working from the premise that there is one and only one. However, the estimates that emerge from WordFish are broadly similar to those highlighted by SFA.

Conclusion

We use Sparse Factor Analysis, SFA, Kim, Londregan and Ratkovic (2018) to examine Chilean newspaper headlines related to the 1972 Trucker's strike and the 1973 public debate about the UP government's implementation of education policy. We find substantial evidence that newspapers were polarized along a single left to right ideological dimension in both episodes, with the same papers aligning in more or less the same way in both settings. We find substantial variation in the ideological content of words, with some topical words, such as "education" or "truck", only applying to one episode or the other. Other words, such as "support" and "reject" actually switch polarity when we move from one *corpus* to another, highlighting the importance of context for text analysis. We reanalyze the education policy headlines using Word Fish Slapin and Proksch (2003) as a check on robustness–the Word Fish estimator is hampered by bootstrapping issues, yet it finds data features that are broadly similar to, if somewhat less detailed than, those uncovered by SFA.

We find that several newspaper owned by the Edwards family took different ideological positions during these episodes, suggesting that, in a similar spirit to findings by Gentzkow and Shapiro (2006), their ideological tilt was more a matter of pandering to the biases of their readership than a question of exercising public opinion leadership. In similar vein, the newspaper associated with the opposition National Party, *La Tribuna* took a more moderate policy stance than the paper, *La Prensa* associated with the more moderate Christian Democratic party, contrary to what an opinion leadership model would predict, but in keeping with

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[21]The credible interval is [00.178, 1.063]

what we might see if newspapers pandered to the preconceptions of their readers. Our findings suggest analysts should pay more attention to newspaper headlines, which encapsulate a high relative does of editorial emphasis in relatively few words.
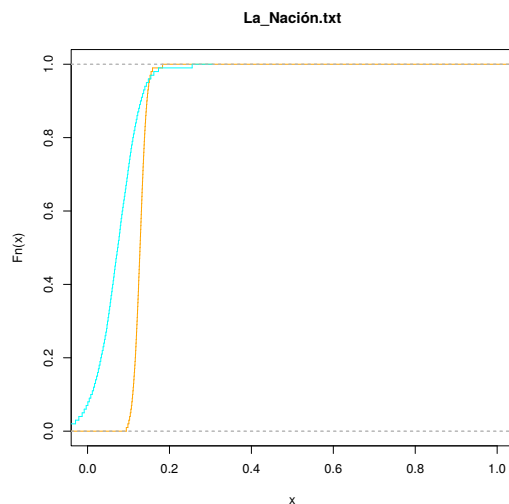
Figure 5: $x_{\text{Nacion}}^{\text{Paro}}$ dominates $x_{\text{Nacion}}^{\text{ENU}}$

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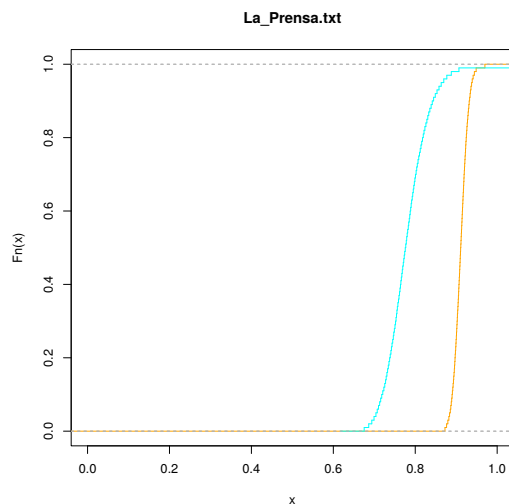
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Figure 6: x_{Prensa}^{Paro} dominates x_{Prensa}^{ENU}

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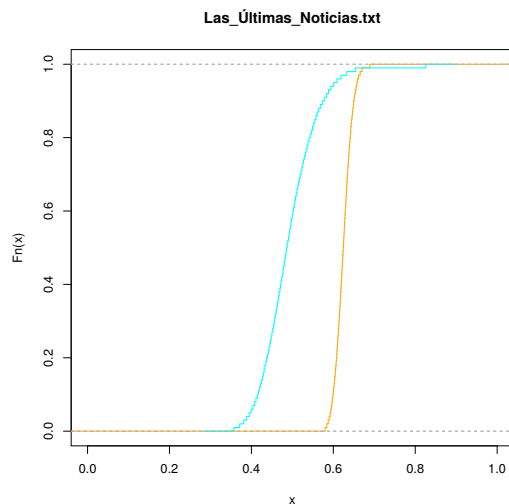
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Figure 7: $x^{Paro}_{UltimasNoticias}$ dominates $x^{ENU}_{UltimasNoticias}$

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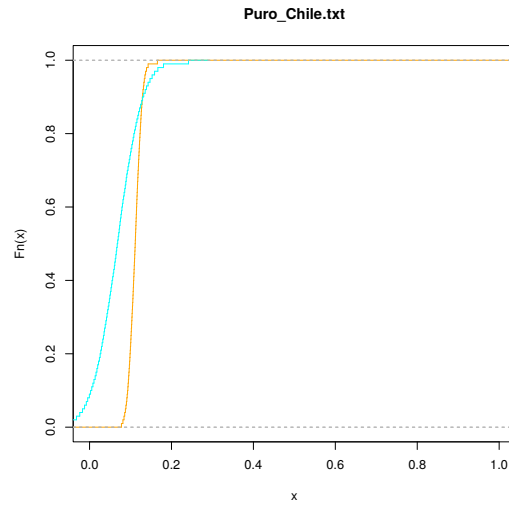
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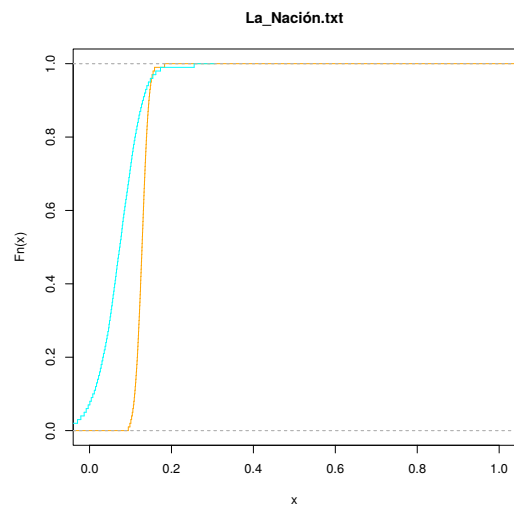
La_Nación.txt

Figure 9: $x^{\text{Paro}}_{\text{Nacion}}$ dominates $x^{\text{ENU}}_{\text{Nacion}}$