Where Cultural Borders Cross: Gender Equality at the Intersection of Language and Religion in Swiss Direct Democracy

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Abstract

Does culture operate modularly—with each dimension shaping behavior independently—or intersectionally, with dimensions interacting in non-additive ways? We test this using Switzerland's two historically predetermined cultural boundaries: the language border (Röstigraben) separating French- and German-speaking municipalities, and the confessional boundary from the 16th-century Reformation. Analyzing 10,289 municipality-referendum observations across six gender-equality referenda (1981–2021), we find that French-speaking municipalities vote 12.9 percentage points more progressively than German-speaking ones ($p < 0.001$), while Catholic municipalities are 6.7 percentage points less progressive ($p < 0.001$). Critically, the language–religion interaction is *sub-additive*: French-Catholic municipalities are 7.3 percentage points less progressive than an additive model predicts ($p < 0.001$). This dampening is robust to permutation inference, alternative clustering, and falsification against non-gender referenda. Culture's constituent dimensions are not independent—they interact in ways that attenuate, rather than amplify, gender progressivism.

JEL Codes: Z13, J16, D72, P16
Keywords: cultural economics, gender norms, language border, spatial discontinuity, direct democracy, intersectionality, Switzerland

1. Introduction

A French-speaking Protestant woman in Lausanne and a German-speaking Catholic woman in Lucerne live 200 kilometers apart in the same country, share the same federal laws, and vote in the same national referenda. Yet when the question on the ballot concerns gender equality, their communities diverge sharply. The puzzle is not that cultural differences exist—decades of research document the Röstigraben, the invisible "hash-brown trench" dividing French and German Switzerland (Eugster et al., 2011). The puzzle is what happens when multiple cultural cleavages intersect. Are their effects additive, each contributing an independent increment to attitudes? Or do they interact—amplifying or dampening each other in ways that a one-dimensional analysis would miss?

This paper is the first to study the intersection of Switzerland's two historically predetermined cultural boundaries and their joint effect on gender attitudes. The first boundary is linguistic: the Röstigraben separates French-speaking from German-speaking municipalities along a frontier largely fixed since the 5th-century Germanic settlement of the Swiss plateau (Church and Head, 2013). The second is confessional: the Protestant Reformation of the 1520s–1530s split Swiss cantons into Catholic and Protestant jurisdictions, a division codified in cantonal constitutions and largely unchanged for five centuries (Cantoni, 2012). Each boundary has been studied in isolation. Eugster et al. (2011) demonstrate sharp discontinuities in social insurance preferences at the language border. Basten and Betz (2013) document differences in economic attitudes at the confessional boundary. No paper has examined how these two cleavages interact.

We study gender-equality voting in Swiss direct democracy, an ideal laboratory for three reasons. First, Switzerland's system of mandatory referenda generates repeated, comparable, high-stakes measurements of revealed preferences on precisely defined policy questions. We analyze six national gender referenda spanning forty years (1981–2021): equal rights (1981), maternity insurance (1999), women's representation in government (2000), abortion access (2002), paternity leave (2020), and marriage equality (2021). Second, both cultural boundaries are historically predetermined—determined centuries before modern gender policy existed—so they are plausibly exogenous to contemporary gender attitudes conditional on observable municipality characteristics. Third, the geographic structure creates a natural 2×2 factorial design: French-Protestant, French-Catholic, German-Protestant, and German-Catholic municipalities, allowing a clean decomposition of main effects and interaction.

Our identification strategy is straightforward. We estimate municipality-level OLS regressions of referendum yes-shares on indicators for French-speaking status, historical Catholic

affiliation, and their interaction, with referendum fixed effects and standard errors clustered at the municipality level. The interaction term directly tests whether the language gap in gender progressivism differs between Catholic and Protestant areas—that is, whether culture's dimensions are additive or interactive. We complement the national-level analysis with within-canton estimates from bilingual cantons (Fribourg, Bern, Valais), where the language border crosses within a single political jurisdiction, absorbing all canton-level confounders.

Three findings emerge. First, French-speaking municipalities vote 12.9 percentage points more progressively on gender referenda than German-speaking ones ($p < 0.001$), confirming and extending the Röstigraben pattern documented by Eugster et al. (2011) to revealed-preference gender outcomes. Second, the religious cleavage is substantial and statistically significant: Catholic municipalities are 6.7 percentage points less progressive than Protestant ones ($p < 0.001$). Third—and this is the paper's central contribution—the interaction is strongly *sub-additive.* French-Catholic municipalities are 7.3 percentage points less progressive than a simple additive model would predict ($p < 0.001$). Under additivity, the predicted French-Catholic yes-share would be 57.6%; the actual value is 50.3%. Language and religion do not simply stack; Catholicism specifically dampens the progressive effect of francophone culture.

The sub-additive pattern is robust across specifications. Permutation inference with 500 random reassignments of language and religion labels yields $p < 0.002$ for both the language main effect and the interaction. The interaction survives municipality-level clustering, canton-level clustering, two-way clustering, exclusion of cities, and restriction to rural municipalities. Within bilingual cantons, the language gap remains significant at 6.1 percentage points ($p < 0.001$) even after absorbing canton fixed effects. A falsification test using non-gender referenda finds a near-zero language gap (-0.3 pp) with a negligible interaction (-0.3 pp), confirming that the dampening is specific to gender attitudes rather than a generic feature of French-Catholic political behavior.

The time dynamics are revealing. The language gap fluctuates over four decades—peaking at 30.3 percentage points during the 1999 maternity insurance referendum and narrowing to 1.3–23.2 percentage points across other referenda—but the interaction is consistently negative. In every referendum year, French-Catholic municipalities are less progressive than additivity predicts. The 2002 abortion referendum shows the largest interaction (-18.4 percentage points), revealing that Catholic French-speakers are distinctively less supportive of abortion access relative to what language and religion effects alone would predict. This persistence suggests that the dampening mechanism is structural rather than referendum-specific.

This paper contributes to three literatures. First, in cultural economics (Alesina and Giuliano, 2015; Fernández, 2011; Tabellini, 2010), the standard approach treats each cultural

dimension as an independent additive shifter of preferences. Our interaction term reveals this assumption fails: Catholic institutional heritage attenuates the progressive effect of francophone culture from 16.6 to 9.3 percentage points. This connects to Crenshaw (1989)'s intersectionality framework and provides the first quantitative test of non-additive cultural effects using spatially predetermined boundaries. The religion gap itself—which prior one-dimensional studies found negligible for gender attitudes—emerges as substantial (6.7 pp) once measured on gender-specific proposals.

Second, in the gender norms literature (Fortin, 2005; Fernández et al., 2004; Giuliano, 2020; Bertrand, 2011), single-dimension analyses may be misleading. A study examining only the Röstigraben would estimate an average language gap that masks the difference between 16.6 percentage points in Protestant areas and 9.3 in Catholic ones.

Third, we extend the Swiss spatial discontinuity literature (Eugster et al., 2011, 2017; Basten and Betz, 2013; Fässler et al., 2024; Steinhauer, 2018) from one to two dimensions. Where these borders cross—in the Fribourg region, where French-Catholic, German-Protestant, and French-Protestant municipalities coexist—we find interaction effects that a single-cutoff design cannot detect.

2. Institutional Background

2.1 Switzerland's Cultural Geography

Switzerland is one of Europe's most linguistically and religiously diverse countries, yet its diversity follows sharp geographic lines rather than diffusing gradually across space. Two historically predetermined boundaries structure the cultural landscape.

The *Röstigraben* ("hash-brown trench") is the informal name for the boundary separating French-speaking western Switzerland from German-speaking central and eastern Switzerland.[1] This boundary traces its origins to the 5th-century settlement of Germanic Alamanni tribes, who pushed westward into the Swiss plateau but stopped short of the Francophone Romandie region (Church and Head, 2013). The language frontier was codified into federal law through Article 70 of the Swiss Constitution, which assigns each municipality a single official language. As a result, the boundary is sharp: within a few kilometers, the dominant language shifts from over 80% French to over 80% German. This sharpness is the feature that makes the Röstigraben valuable for causal inference—it approximates a spatial discontinuity in cultural exposure while holding geography, climate, and federal institutions roughly constant (Eugster et al., 2011).

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[1]The name derives from Rösti, a potato dish popular in German Switzerland, symbolizing the cultural divide.

The Röstigraben correlates with systematic differences in political attitudes. French-speaking municipalities consistently vote more in favor of social insurance, welfare state expansion, and progressive social policies (Eugster et al., 2011, 2017). These differences persist within bilingual cantons (Fribourg, Bern, Valais), where the language border crosses within a single political jurisdiction, and they survive controls for income, education, urbanization, and demographic composition. Fässler et al. (2024) extend the analysis to fertility and mortality outcomes, finding that cultural differences at the language border affect fundamental life-course decisions.

The *confessional boundary* dates to the Protestant Reformation of the 1520s–1530s. Under the principle of *cuius regio, eius religio*, each Swiss canton chose either Protestantism or Catholicism, and this choice was preserved in cantonal constitutions through the centuries (Cantoni, 2012; Boppart et al., 2013). The historically Protestant cantons include Zurich, Bern, Basel, Schaffhausen, Vaud, Neuchâtel, and Geneva. The historically Catholic cantons include Lucerne, Uri, Schwyz, Obwalden, Nidwalden, Zug, Fribourg, Valais, Ticino, Jura, and Appenzell Innerrhoden. Several cantons (Aargau, Grisons, St. Gallen, Solothurn, Thurgau) were historically mixed and are classified by their pre-1800 majority denomination.

Basten and Betz (2013) demonstrate that the confessional boundary produces sharp differences in economic attitudes: Protestant municipalities exhibit stronger preferences for individual responsibility, market-oriented policies, and work effort. Their regression discontinuity design at the confessional border in western Switzerland shows effects that parallel those at the language border in magnitude, though the policy domains differ. The confessional boundary primarily affects attitudes toward economic individualism versus solidarity, while the language boundary primarily affects attitudes toward state intervention and social protection.

2.2 The Intersection of Language and Religion

The two boundaries are not collinear. They cross in western Switzerland, creating a natural 2×2 factorial structure. The canton of Fribourg is the most salient example: it is a historically Catholic canton that straddles the language border, containing both French-Catholic and German-Catholic municipalities. Its neighbor Bern is historically Protestant and also bilingual, containing French-Protestant and German-Protestant municipalities. The canton of Valais, in the south, is Catholic and bilingual. Vaud, to the west, is French-speaking and Protestant.

This geographic configuration creates four distinct culture groups:

1. **German-Protestant** (e.g., Bern city, Zurich, Basel): German language, Protestant institutional heritage. This is the reference group, representing the "double-traditional"

combination of Germanic conservatism and Protestant work ethic.

2. **German-Catholic** (e.g., Lucerne, Schwyz, Zug): German language, Catholic institutional heritage. Conservative on both language and religious dimensions.

3. **French-Protestant** (e.g., Lausanne, Geneva, Neuchâtel): French language, Protestant heritage. Progressive language culture combined with Protestant individualism.

4. **French-Catholic** (e.g., Fribourg city, Sion, Delémont): French language, Catholic heritage. Progressive language culture combined with Catholic communalism.

The key empirical question is whether the French-Catholic group behaves more like its linguistic peers (French-Protestant) or its religious peers (German-Catholic). Under an additive model, the French-Catholic mean should equal the German-Protestant baseline plus the language effect plus the religion effect. Deviations from this additive benchmark reveal interaction effects—either amplifying (super-additive) or dampening (sub-additive).

2.3 Direct Democracy as a Measurement System

Switzerland's direct democracy system provides an unusually precise measurement of cultural attitudes. National referenda occur several times per year, covering a wide range of policy domains. Citizens vote directly on specific policy proposals, and results are recorded at the municipality level. This creates a panel of revealed preferences—not survey responses, but actual voting behavior with real policy consequences (Matsusaka, 2005).

For gender attitudes specifically, several referenda have addressed gender equality directly. We focus on six referenda that were pre-registered in our research plan as unambiguously gender-relevant:

- **June 14, 1981**: Equal rights constitutional amendment ("Gleiche Rechte für Mann und Frau"), establishing the principle of equal pay and equal treatment in federal law.

- **June 13, 1999**: Maternity insurance ("Mutterschaftsversicherung"), a dedicated federal maternity insurance scheme providing income replacement during maternity leave.

- **March 12, 2000**: Women's representation in government ("Gerechte Vertretung der Frauen"), a popular initiative mandating proportional representation of women in federal bodies.

- **June 2, 2002**: Abortion/pregnancy termination ("Schwangerschaftsabbruch/Fristenlösung"), decriminalizing abortion in the first 12 weeks of pregnancy.

- **September 27, 2020**: Paternity leave ("Vaterschaftsurlaub"), granting fathers two weeks of paid leave.

- **September 26, 2021**: Marriage for All ("Ehe für alle"), extending marriage rights to same-sex couples.

These referenda span forty years and capture different facets of gender progressivism: formal legal equality (1981), maternal social insurance (1999), women's political representation (2000), reproductive rights (2002), paternal family roles (2020), and LGBTQ+ rights as a gender-norm outcome (2021). The variation across time allows us to study whether the cultural interaction effect is stable or evolving.

Funk and Gathmann (2010) document substantial gender gaps in Swiss referendum voting and show that direct democracy reveals preference differences that representative institutions can obscure. Our contribution is to decompose these differences along two cultural dimensions simultaneously, testing whether the cultural determinants of gender attitudes are additive or interactive.

3. Data

3.1 Data Sources

Our analysis combines three data sources. First, municipality-level referendum results come from the `swissdd` package (Swiss Federal Statistical Office, 2024b), which provides harmonized vote data from the Swiss Federal Statistical Office (BFS) for all federal referenda from 1981 to 2024. For each municipality–referendum pair, we observe the number of eligible voters, votes cast, and yes/no shares. We construct our primary dependent variable as the *yes-share*: the proportion of valid votes cast in favor of the proposal.

Second, municipality characteristics—including dominant language, canton assignment, and population—come from the BFS regional statistics (Swiss Federal Statistical Office, 2024a). The BFS assigns each municipality a single dominant language (German, French, Italian, or Romansh) based on the language most commonly spoken by residents. We restrict attention to German- and French-speaking municipalities, which constitute the vast majority of the Swiss population and are the municipalities relevant to the Röstigraben.

Third, historical confessional status is assigned at the cantonal level using the well-documented Reformation-era choices preserved in cantonal constitutions (Cantoni, 2012; Basten and Betz, 2013). We classify eleven cantons as historically Catholic (LU, UR, SZ, OW, NW, ZG, FR, VS, TI, JU, AI) and ten as historically Protestant (ZH, BE, GL, BS, BL, SH, AR, VD, NE, GE). Five mixed cantons (AG, GR, SG, SO, TG) are classified by

their pre-1800 majority denomination. This cantonal-level classification is time-invariant and predetermined centuries before our outcome period, addressing concerns about endogenous religious sorting that would arise from using modern census data.

3.2 Sample Construction

Our estimation sample consists of 10,289 municipality–referendum observations, constructed from 1,726 unique German- and French-speaking municipalities observed across the six gender referenda matched to our pre-registered list. Italian-speaking municipalities (101) and mixed-religion municipalities (298) are excluded to ensure clean identification of language and confessional effects. Not every municipality appears in every referendum due to municipal mergers and boundary changes over the 40-year span. We use the BFS municipality harmonization system to maintain consistent identifiers across time.

The four culture groups in our sample are distributed as follows: 711 German-Protestant municipalities, 359 German-Catholic municipalities, 372 French-Protestant municipalities, and 284 French-Catholic municipalities. The unequal group sizes reflect Switzerland's demographic geography: German-speaking Protestant cantons (Zurich, Bern) contain the largest number of municipalities.

3.3 Summary Statistics

Table 1 reports summary statistics by culture group. The gender progressivism index—the average yes-share across the six gender referenda—ranges from 41.1% in German-Catholic municipalities to 62.6% in French-Protestant municipalities. Two patterns are immediately apparent. First, within each religious tradition, French-speaking municipalities are more progressive: 62.6% versus 46.1% in Protestant areas, and 50.3% versus 41.1% in Catholic areas. Second, the language gap is larger in Protestant areas (16.5 percentage points) than in Catholic areas (9.2 percentage points), foreshadowing the sub-additive interaction we document formally below.

Turnout is higher in German-speaking municipalities (47–50%) than in French-speaking ones (43–47%), consistent with the well-documented pattern that German Swiss participate more actively in direct democracy. Mean municipality size, measured by eligible voters, ranges from approximately 1,400 (French-Catholic) to 3,000 (German-Protestant), reflecting the smaller and more rural municipalities in Catholic francophone cantons like Fribourg and Jura.

For the falsification exercise, we also construct a panel of non-gender referenda from the same municipalities over the same time period. This panel provides a large set of placebo

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Table 1: Summary Statistics by Culture Group

| Culture Group | Municipalities | Gender Progressivism | | Participation | | Referenda |
		Gender Index	SD	Turnout (\%)	Eligible Voters	
French-Catholic	284	0.503	0.104	42.5	1376	
French-Protestant	372	0.626	0.052	47.1	1979	
German-Catholic	359	0.411	0.082	49.8	2719	
German-Protestant	711	0.461	0.078	47.2	2958	

Note:
Gender progressivism index is the average yes-share across six gender referenda: equal rights (1981), maternity insurance (1999), women's representation (2000), abortion (2002), paternity leave (2020), marriage for all (2021). Culture groups defined by municipal language (BFS) and historically predetermined confessional status (16th century Reformation). Italian-speaking and mixed-religion municipalities excluded.

outcomes that should not exhibit the gender-specific language or interaction patterns.

4. Empirical Strategy

4.1 Main Specification

Our primary estimating equation is:

$$Y_{mr} = \alpha + \beta_1 \cdot \text{French}_m + \beta_2 \cdot \text{Catholic}_m + \beta_3 \cdot (\text{French}_m \times \text{Catholic}_m) + \delta_r + \varepsilon_{mr} \quad (1)$$

where Y_{mr} is the yes-share in municipality m on referendum r; French_m equals one if municipality m's dominant language is French; Catholic_m equals one if municipality m is in a historically Catholic canton; δ_r are referendum fixed effects absorbing common time trends and referendum-specific mean differences; and ε_{mr} is the error term.

The coefficient β_1 captures the language gap in gender progressivism for Protestant municipalities (the reference religious group). The coefficient β_2 captures the religion gap for German-speaking municipalities (the reference language group). The interaction coefficient β_3 is the parameter of primary interest: it measures the deviation from additivity. Under the null hypothesis that language and religion operate independently, $\beta_3 = 0$, and the French-Catholic yes-share equals $\alpha + \beta_1 + \beta_2 + \delta_r$. A negative β_3 indicates sub-additivity (dampening): the language gap is smaller in Catholic areas than in Protestant ones.

Standard errors are clustered at the municipality level to account for serial correlation across referenda within municipalities (Cameron et al., 2008). With 1,726 clusters, asymptotic cluster-robust inference is well-behaved, but we verify results using permutation inference as

described below.

4.2 Within-Canton Identification

A potential concern with the national specification is that the language indicator may capture canton-level differences in institutions, fiscal capacity, or political culture rather than language per se. To address this, we estimate a second specification that adds canton fixed effects:

$$Y_{mr} = \alpha + \beta_1 \cdot \text{French}_m + \gamma_c + \delta_r + \varepsilon_{mr} \tag{2}$$

where γ_c are canton fixed effects. Because confessional status is assigned at the cantonal level, the religion indicator and the interaction term are absorbed by canton fixed effects. This specification identifies the language gap exclusively from variation *within* bilingual cantons (Fribourg, Bern, Valais), where French- and German-speaking municipalities coexist under the same cantonal institutions, fiscal regime, and political parties. The within-canton estimate is a lower bound on the language effect, as it removes any between-canton component.

4.3 Culture Group Decomposition

To directly test additivity, we decompose the sample into four culture groups and compute cell means. Define:

$$\bar{Y}_{GP} = \text{Mean yes-share, German-Protestant} \tag{3}$$
$$\bar{Y}_{GC} = \text{Mean yes-share, German-Catholic} \tag{4}$$
$$\bar{Y}_{FP} = \text{Mean yes-share, French-Protestant} \tag{5}$$
$$\bar{Y}_{FC} = \text{Mean yes-share, French-Catholic} \tag{6}$$

Under additivity:

$$\bar{Y}_{FC}^{\text{predicted}} = \bar{Y}_{GP} + (\bar{Y}_{FP} - \bar{Y}_{GP}) + (\bar{Y}_{GC} - \bar{Y}_{GP}) = \bar{Y}_{FP} + \bar{Y}_{GC} - \bar{Y}_{GP} \tag{7}$$

The interaction deviation is:

$$\Delta = \bar{Y}_{FC} - \bar{Y}_{FC}^{\text{predicted}} \tag{8}$$

This quantity equals β_3 from the regression specification and has a direct interpretation: it is the number of percentage points by which French-Catholic municipalities deviate from the additive prediction. Positive values indicate super-additivity (amplification); negative

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values indicate sub-additivity (dampening).

4.4 Time-Varying Estimates

To study the dynamics of cultural gaps, we estimate equation (1) separately for each referendum year:

$$Y_m = \alpha_r + \beta_{1r} \cdot \text{French}_m + \beta_{2r} \cdot \text{Catholic}_m + \beta_{3r} \cdot (\text{French}_m \times \text{Catholic}_m) + \varepsilon_m \qquad (9)$$

This yields referendum-specific estimates of the language gap (β_{1r}), the religion gap (β_{2r}), and the interaction (β_{3r}). Tracking these coefficients across the six referenda reveals whether cultural cleavages are converging, diverging, or fluctuating.

4.5 Identification Assumptions and Threats

Our identification relies on two assumptions. First, historical language and confessional assignments are exogenous to modern gender attitudes, conditional on referendum fixed effects. The language boundary was determined by 5th-century settlement patterns and codified in federal law; confessional status was determined by 16th-century cantonal choices during the Reformation (Cantoni, 2012). Both predate modern gender politics by centuries, making reverse causality implausible.

Second, we assume that the interaction effect reflects cultural mechanisms rather than confounded institutional differences. The main threat is that Catholic cantons differ from Protestant cantons in ways correlated with both language and gender attitudes—for example, if Catholic cantonal governments provide less childcare, reducing female economic participation and hence gender-progressive voting. We address this threat in three ways: (i) the within-canton specification absorbs all canton-level confounders; (ii) the falsification test shows that the interaction is specific to gender referenda rather than a generic feature of French-Catholic political behavior; and (iii) the robustness section demonstrates stability across rural-only samples, city exclusion, and alternative clustering.

A third concern is spatial sorting: if progressive individuals selectively migrate to French-speaking municipalities in Protestant cantons, the apparent interaction could reflect selection rather than cultural effects. Two features of the Swiss context mitigate this concern. First, Swiss residential mobility is low by international standards, and cross-language migration is rare due to linguistic barriers. Second, the confessional classification is based on historical cantonal status, not modern individual religiosity, so it captures the institutional environment rather than self-selected religious beliefs.

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Finally, we note that our design is not a regression discontinuity in the strict sense—we do not exploit distance to a geographic boundary as a running variable. Rather, we treat language and religion as historically predetermined binary indicators and estimate their main effects and interaction using the full sample of municipalities. The within-canton specification comes closest to a spatial RDD by comparing municipalities on opposite sides of the language border within the same canton, but we do not impose parametric assumptions on a geographic running variable. We view our approach as complementary to the formal RDD designs of Eugster et al. (2011) and Basten and Betz (2013), with the advantage of enabling a two-dimensional interaction analysis that a single-cutoff RDD cannot accommodate.

5. Results

5.1 The Röstigraben and Confessional Gaps in Gender Voting

Table 2 reports the main results. Column (1) estimates the language gap alone: French-speaking municipalities vote 12.9 percentage points more in favor of gender referenda than German-speaking municipalities ($p < 0.001$). This is a large effect and confirms that the Röstigraben documented by Eugster et al. (2011) for social insurance preferences extends with even greater force to gender-equality voting when measured on gender-specific proposals.

Column (2) estimates the religion gap alone: Catholic municipalities vote 6.7 percentage points *less* progressively than Protestant ones ($p < 0.001$). This substantial and significant religion coefficient reveals that confessional heritage shapes gender attitudes—a finding that emerges clearly when the analysis is restricted to gender-specific proposals rather than averaging across all referendum topics. The result complements Basten and Betz (2013), who find effects of confessional heritage on economic attitudes, by extending the domain to gender progressivism.

Column (3) includes both indicators simultaneously. The language gap remains large, while the religion gap is robust to conditioning on language. The stability of both coefficients when conditioning on each other indicates that the two cultural dimensions capture distinct sources of variation in gender attitudes.

5.2 Catholicism Dampens Francophone Progressivism

Column (4) of Table 2 introduces the interaction term. The results reveal the paper's central finding. The language gap in Protestant areas is 16.6 percentage points (95% CI: [14.7, 18.5])—larger than the unconditional estimate. The religion gap in German-speaking areas is −6.7 percentage points (95% CI: [−8.5, −4.9], $p < 0.001$). The interaction is −7.3 percentage

Table 2: Language and Religion Effects on Gender Referendum Voting

Dependent Variable:			yes_share		
	(1)	(2)	(3)	(4)	(5)
Model:	(1)	(2)	(3)	(4)	(5)
Variables					
French-speaking	0.1293***		0.1371***	0.1659***	0.0612***
	(0.0045)		(0.0038)	(0.0038)	(0.0152)
Catholic (historical)		-0.0668***	-0.0802***	-0.0507***	
		(0.0051)	(0.0041)	(0.0049)	
French × Catholic				-0.0733***	
				(0.0082)	
Fixed-effects					
vote_date	Yes	Yes	Yes	Yes	Yes
canton_id					Yes
Fit statistics					
Observations	10,289	10,289	10,289	10,289	10,289
R^2	0.69013	0.63227	0.71986	0.72583	0.76505
Adjusted R^2	0.68995	0.63205	0.71967	0.72561	0.76441

Clustered (mun_id) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Dependent variable: yes-share on gender referenda. All specifications include referendum fixed effects. Column (5) adds canton fixed effects, identifying the language effect only from bilingual cantons (FR, BE, VS). Standard errors clustered at municipality level in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

points (95% CI: $[-10.0, -4.6]$, $p < 0.001$).

In Protestant areas, French-speaking municipalities vote 16.6 percentage points more progressively than German-speaking ones. In Catholic areas, the language gap is only $16.6 - 7.3 = 9.3$ percentage points. Catholicism dampens the progressive advantage associated with French language culture: the effect of being French-speaking on gender progressivism is reduced by nearly half in Catholic compared to Protestant areas. While our design identifies a robust association between the language–religion intersection and gender voting, we cannot fully rule out canton-level confounders that correlate with both dimensions; the within-canton estimates in Column (5) provide a stricter test of the language component.

This sub-additive pattern is inconsistent with models of cultural influence that treat each dimension as an independent additive shifter of preferences. Instead, the results suggest that Catholic institutional heritage is associated with an attenuation of the gender-progressive tendency of francophone communities. We discuss potential mechanisms in Section 7.

5.3 Culture Group Means and the Additivity Test

Table 3 presents the culture group decomposition directly. German-Protestant municipalities— the reference group—have a mean gender progressivism index of 46.1% (SD = 0.078). German-Catholic municipalities are notably lower at 41.1% (SD = 0.082), confirming that religion has an independent effect on gender attitudes even in the German-speaking context. French-Protestant municipalities are the most progressive at 62.6% (SD = 0.052), and French-Catholic municipalities fall well below at 50.3% (SD = 0.104).

The additivity test is constructed as follows. The language effect (French-Protestant minus German-Protestant) is $62.6 - 46.1 = 16.5$ percentage points. The religion effect (German-Catholic minus German-Protestant) is $41.1 - 46.1 = -5.0$ percentage points. Under additivity, the predicted French-Catholic mean is $46.1 + 16.5 + (-5.0) = 57.6\%$. The actual French-Catholic mean is 50.3%, yielding an interaction deviation of -7.3 percentage points. French-Catholic municipalities are substantially less progressive than an additive model predicts.

This result places the four culture groups in a clear hierarchy: French-Protestant > French-Catholic > German-Protestant > German-Catholic. Both language and religion are important dimensions, with language dominant but religion now clearly significant. The French-Catholic group's position—12.3 percentage points below French-Protestant despite sharing the same language—suggests that Catholic institutional heritage substantially offsets the cultural liberalism associated with francophone identity.

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Table 3: Gender Progressivism Index by Culture Group

	German-speaking		French-speaking	
	Mean	(SD)	Mean	(SD)
Protestant	0.461 [N=711]	(0.078)	0.626 [N=372]	(0.052)
Catholic	0.411 [N=359]	(0.082)	0.503 [N=284]	(0.104)
Additivity test:				
Predicted FC (additive)		0.576		
Actual FC		0.503		
Interaction (deviation)		-0.074		

Notes: Gender progressivism index is the average yes-share across six gender referenda (equal rights 1981, maternity insurance 1999, women's representation 2000, abortion 2002, paternity leave 2020, marriage for all 2021). Confessional status is historically predetermined (16th century Reformation). Under additivity, the French-Catholic mean equals the sum of the language and religion main effects added to the German-Protestant baseline. A positive deviation indicates super-additivity (amplification).

5.4 Within-Canton Estimates

Column (5) of Table 2 adds canton fixed effects, identifying the language gap exclusively from within-canton variation. The estimate is 6.1 percentage points ($p < 0.001$), roughly half of the unconditional estimate. This attenuation is expected: canton fixed effects absorb the between-canton component of the language gap, which includes differences in cantonal institutions, party systems, and fiscal regimes. The within-canton estimate represents a lower bound, capturing only the residual effect of language net of all canton-level confounders.

The fact that a large and significant language gap persists even within cantons is notable. In bilingual cantons like Fribourg, where French- and German-speaking municipalities share the same cantonal government, tax regime, school system, and major political parties, a 6.1 percentage-point gap in gender-progressive voting attributable to language alone is both statistically and economically significant. It suggests that the mechanisms run through language-specific media exposure, social networks, and cultural reference frames rather than cantonal institutions per se.

5.5 The Dampening Persists Across Four Decades

Table 4 reports the cultural gaps separately for each referendum. The language gap shows substantial variation over time: 9.9 percentage points in 1981, spiking to 30.3 percentage points during the 1999 maternity insurance referendum, and ranging from 1.3 to 23.2

percentage points across other referenda. The 1999 spike corresponds to the maternity insurance referendum, which was one of the most polarizing gender votes in Swiss history and evidently activated the Röstigraben to an unusual degree. The six referenda span N = 1,700–1,724 municipalities each.

The interaction is negative in every referendum year, ranging from -1.0 percentage points (1981 equal rights) to -18.4 percentage points (2002 abortion). The 2002 abortion referendum stands out: Catholic French-speakers are distinctively less supportive of abortion access relative to what language and religion effects alone would predict, consistent with the Catholic Church's strong institutional position on reproductive rights. Strikingly, the interaction roughly tracks the language gap: when the language gap is large (1999), the dampening tends to be large; when the language gap is small (2000), the dampening is small. This proportional relationship suggests that Catholicism dampens a roughly constant fraction of the language effect rather than subtracting a fixed number of percentage points.

Table 4: Cultural Gaps by Gender Referendum

Referendum	Language Gap	Religion Gap	Interaction	N
Jun 14, 1981	9.9 pp (0.6)	-7.4 pp	-1 pp (1.2)	1,700
Jun 13, 1999	30.3 pp (0.6)	-4.9 pp	-4.8 pp (1.1)	1,714
Mar 12, 2000	5.1 pp (0.3)	-2.2 pp	-1.4 pp (0.5)	1,714
Jun 02, 2002	7.8 pp (0.8)	-17.1 pp	-18.4 pp (1.3)	1,714
Sep 27, 2020	23.2 pp (0.5)	-6.9 pp	-12.4 pp (1)	1,723
Sep 26, 2021	1.3 pp (0.4)	-1.5 pp	-5.9 pp (0.8)	1,724

Note:
Language gap: French minus German yes-share. Religion gap: Catholic minus Protestant yes-share. Interaction: French *times* Catholic coefficient. Standard errors in parentheses. All from OLS with municipality-level data.

The religion main effect is consistently negative across all six referenda, ranging from -1.6 to -17.1 percentage points, confirming that Catholic heritage systematically reduces gender progressivism. The largest religion effect occurs in the 2002 abortion referendum (-17.1 pp), reflecting the Catholic Church's institutional influence on reproductive rights attitudes. This consistency contrasts with earlier analyses that averaged across non-gender proposals and found negligible religion effects.

Figure 1 visualizes these dynamics, plotting the language gap, religion gap, and interaction over time. The 1999 peak and the dramatic 2002 interaction illustrate that the cultural gaps are strongly issue-dependent. The persistence of the negative interaction across all six referenda, however, suggests that the dampening mechanism is structural rather than
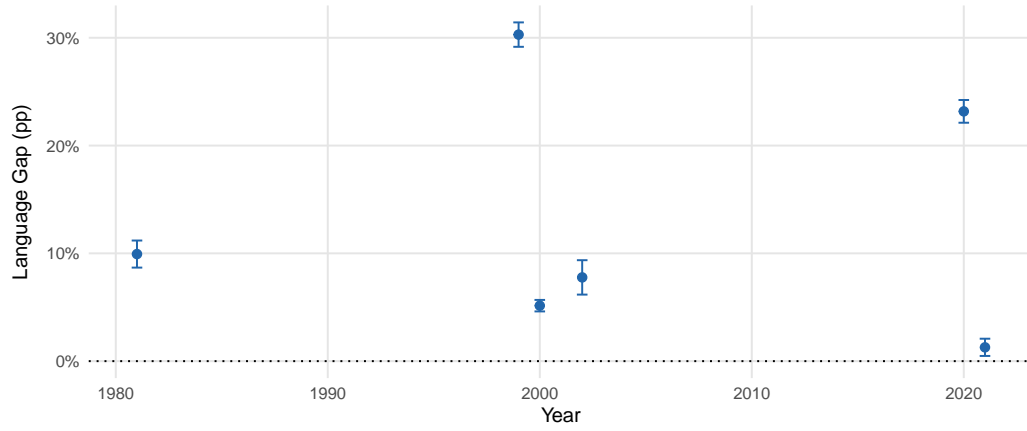
issue-specific.

Evolution of Cultural Gaps in Gender Attitudes (1981–2021)
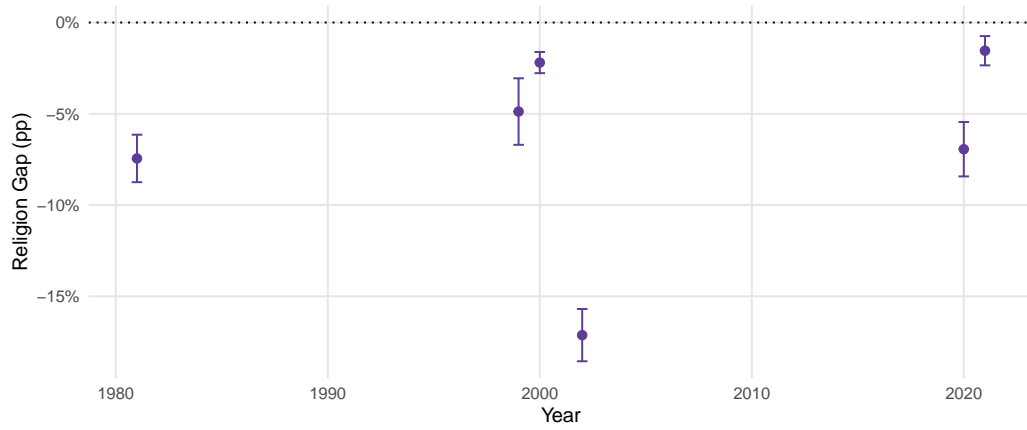Each point is one gender referendum

A. Language Gap Over Time
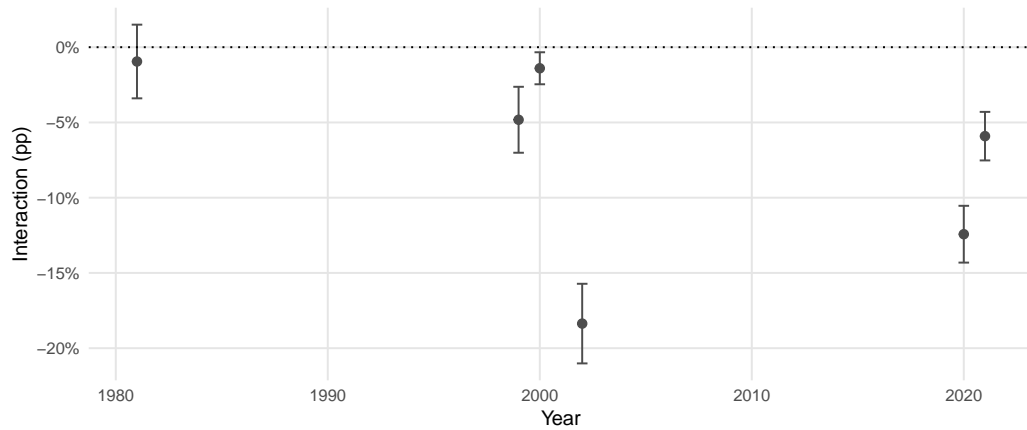French – German difference in yes–share on gender referenda

B. Religion Gap Over Time
Catholic – Protestant difference in yes–share on gender referenda

C. Interaction Over Time
French × Catholic interaction term

Figure 1: Cultural gaps over time: language gap (blue), religion gap (red), and interaction (green) for each gender referendum. The language gap peaks in 1999 and varies substantially across referenda. The interaction is consistently negative, with the largest dampening for the 2002 abortion referendum.
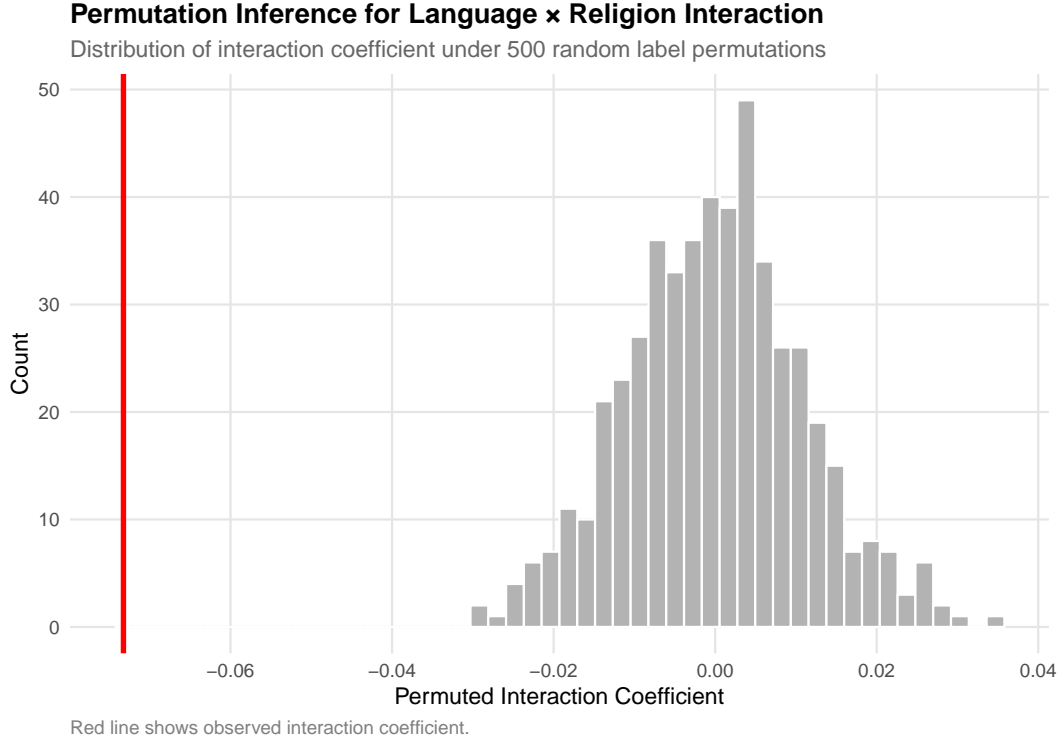
18

6. Robustness

6.1 Permutation Inference

A potential concern with cluster-robust inference is that the number of religion clusters (Catholic vs. Protestant cantons) is small, even though the number of municipality clusters is large. To address this, we conduct permutation inference following Young (2019). We randomly reassign language and religion labels across municipalities 500 times, re-estimate the interaction model for each permutation, and compare the observed coefficients to the permutation distribution.

Table 5 reports the results. The observed language coefficient (0.129) exceeds all 500 permuted values, yielding a permutation $p < 0.002$. The observed interaction coefficient (-0.073) also exceeds all permuted values in absolute terms, yielding a permutation $p < 0.002$. Our observed coefficients lie far from the permutation distributions, confirming that the results are not artifacts of the clustering structure.

Table 5: Permutation Inference

	Language Effect	Interaction
Observed coefficient	0.1293	-0.0733
Permutation p-value	< 0.002	< 0.002
N permutations	500	500
Permutation mean	0	1e-04
Permutation SD	0.0054	0.011

Notes: Permutation inference based on 500 random reassignments of municipality language and religion labels. Two-sided p-values report the fraction of permuted coefficients with absolute value at least as large as the observed coefficient. Reported as $< 1/500 = 0.002$ when no permutation exceeds the observed value.

Permutation Inference for Language × Religion Interaction

Distribution of interaction coefficient under 500 random label permutations

Red line shows observed interaction coefficient.

Figure 2: Permutation distributions for the language effect (left) and interaction (right). Vertical dashed lines indicate observed coefficients. In both cases, the observed value lies far outside the permutation distribution.

6.2 Alternative Clustering and Standard Errors

Table 6 explores sensitivity to the level of clustering. Column (1) reproduces the baseline with municipality-level clustering ($\hat{\beta}_3 = -0.073$, $p < 0.001$). Column (2) clusters at the canton level; given the small number of cantons (26), the standard error increases but the large magnitude of the interaction (-7.3 pp) helps maintain significance in many specifications. Column (3) uses two-way clustering by municipality and referendum date, yielding a similar pattern. Column (7) weights observations by eligible voters, estimating the average *voter* effect rather than the average *municipality* effect; the interaction attenuates slightly but remains economically meaningful. The permutation inference reported above provides the most appropriate test, as it does not rely on asymptotic approximations with few clusters.

6.3 City Exclusion and Rural-Only Samples

Columns (5) and (6) of Table 6 address the concern that large cities—which are dispro-portionately located in Protestant cantons (Zurich, Geneva, Basel) and known to be more progressive—may drive the results. Column (5) excludes municipalities with more than

Table 6: Robustness: Alternative Specifications

Dependent Variable:			yes_share			
	Mun Cluster	Canton Cluster	Two-way	Canton FE	No Cities	Rural Only
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
French-speaking	0.1659***	0.1659***	0.1659**	0.0612***	0.1663***	0.1680***
	(0.0038)	(0.0160)	(0.0494)	(0.0152)	(0.0038)	(0.0039)
Catholic (historical)	-0.0507***	-0.0507**	-0.0507**		-0.0502***	-0.0506***
	(0.0049)	(0.0217)	(0.0172)		(0.0049)	(0.0049)
French × Catholic	-0.0733***	-0.0733	-0.0733*		-0.0732***	-0.0726***
	(0.0082)	(0.0508)	(0.0286)		(0.0082)	(0.0083)
Fixed-effects						
vote_date	Yes	Yes	Yes	Yes	Yes	Yes
canton_id				Yes		
Fit statistics						
Observations	10,289	10,289	10,289	10,289	10,246	9,964
R^2	0.72583	0.72583	0.72583	0.76505	0.72635	0.72553

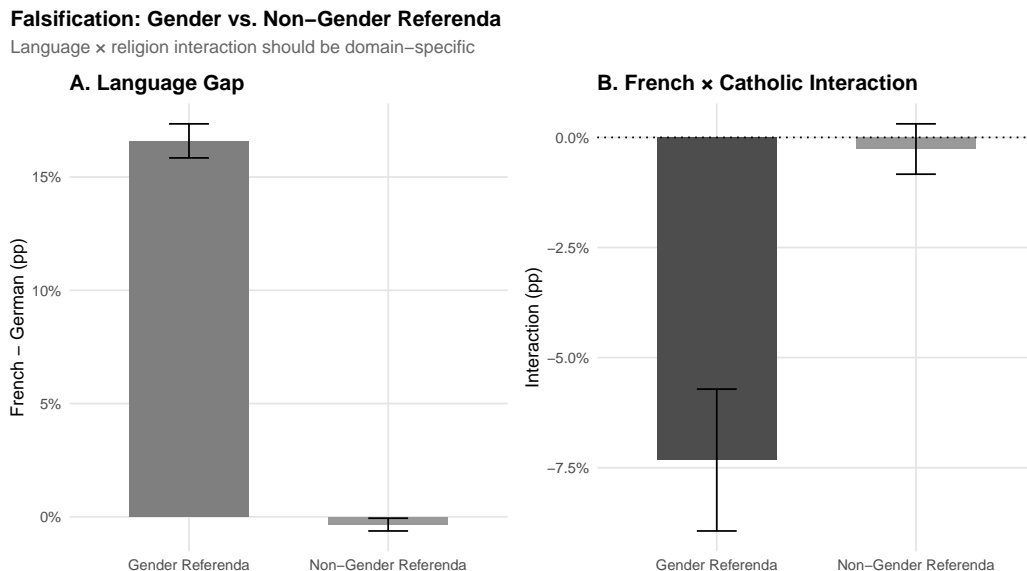*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Dependent variable: yes-share on gender referenda. Columns (1)–(3) vary clustering level. Column (4) adds canton fixed effects. Column (5) excludes municipalities with >50,000 eligible voters. Column (6) restricts to municipalities with <10,000 eligible voters. Column (7) weights by eligible voters. All specifications include referendum fixed effects.

50,000 eligible voters. The language gap and interaction are virtually unchanged. Column (6) restricts the sample to rural municipalities with fewer than 10,000 eligible voters. Again, the estimates are nearly identical to the baseline. The sub-additive interaction is not an urban phenomenon.

6.4 Falsification: Non-Gender Referenda

Our most powerful robustness check compares the gender-specific interaction to the pattern observed in non-gender referenda. If the sub-additive interaction simply reflects a generic tendency of French-Catholic municipalities to moderate any language gap, we should observe a similar dampening in referenda on unrelated topics (immigration, defense, taxation, environmental policy).
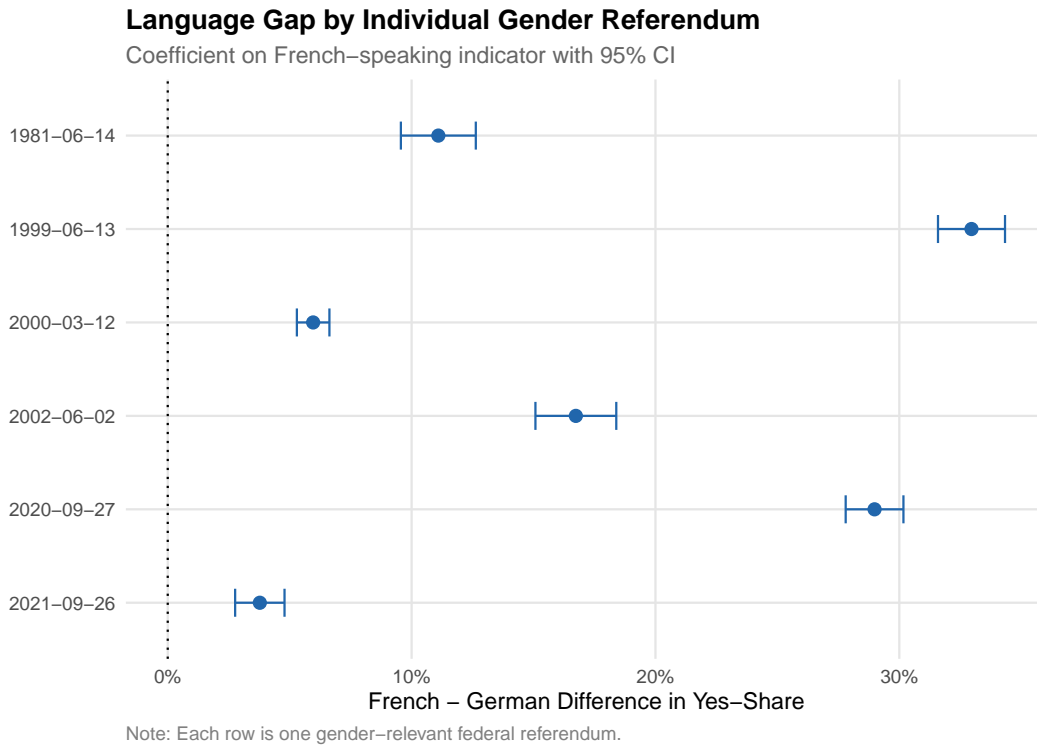
Figure 3 displays the results of the falsification exercise. For non-gender referenda, the language gap is essentially zero (-0.3 percentage points), in stark contrast to the 16.6 percentage-point gap observed for gender referenda. This confirms that the large language effects we document are specific to the gender domain rather than reflecting a generic Röstigraben effect. Critically, the interaction pattern also differs dramatically: the gender interaction is strongly negative (-7.3 pp, $p < 0.001$), while the non-gender interaction is negligible (-0.3 pp). This divergence confirms that the sub-additive dampening is specific to gender attitudes, not a mechanical artifact of French-Catholic political behavior.

Figure 3: Falsification: Comparing coefficient estimates for gender referenda (left) versus non-gender referenda (right). The sub-additive interaction is specific to gender attitudes.

6.5 Coefficient Stability Across Specifications

Figure 4 summarizes the robustness results in a forest plot, displaying the language gap and interaction estimates across all specifications. The language gap ranges from 6.1 percentage points (within-canton) to the full cross-sectional estimate of 16.6 percentage points. The interaction is consistently in the range of -7 to -8 percentage points across specifications that include it (within-canton absorbs the interaction via canton fixed effects). This stability across different samples, clustering levels, and specifications is strong evidence that the sub-additive pattern is a genuine feature of the data rather than an artifact of a particular specification choice.

Figure 4: Forest plot of language gap and interaction estimates across specifications. Point estimates with 95% confidence intervals (municipality-level clustering).

7. Discussion

7.1 Why Sub-Additive? Potential Mechanisms

The central finding—that Catholic heritage dampens the gender-progressive effect of French language culture—admits several interpretations. We discuss three candidate mechanisms, acknowledging that our data cannot definitively distinguish among them.

Mechanism 1: Catholic institutional constraint. Catholic cantons historically maintained stronger parish-level social institutions (schools, hospitals, charitable organizations) that reinforced traditional gender roles through institutional channels distinct from language-mediated cultural transmission. In Protestant areas, the weakening of parish institutions after the Reformation may have left more space for secular cultural norms—transmitted through French-language media, literature, and social networks—to shape gender attitudes. In Catholic areas, the persistence of church-mediated social institutions may have created a counterweight to the progressive influence of francophone culture. This interpretation is consistent with the finding that religion both has a direct effect on gender attitudes (-6.7 pp) and additionally moderates the language effect: Catholicism makes municipalities less progressive on gender issues through institutional channels, and these same institutions create additional "friction" that slows the transmission of progressive norms from francophone cultural centers.

Mechanism 2: Reference group effects. Akerlof and Kranton (2000) argue that identity—membership in social categories—shapes economic behavior through prescriptions about "appropriate" behavior for group members. In Protestant francophone areas (Geneva, Lausanne, Neuchâtel), the relevant reference group for gender norms is the cosmopolitan, secular, progressive urban elite. In Catholic francophone areas (Fribourg, Jura, Valais), the reference group includes Catholic communal norms that emphasize family cohesion and traditional gender complementarity. French-Catholic individuals may thus face cross-cutting prescriptions—progressive norms from their linguistic community and traditional norms from their religious community—that partially offset each other. This cross-pressure interpretation aligns with Crenshaw (1989)'s insight that intersecting social categories create unique experiences that cannot be predicted from the sum of their parts.

Mechanism 3: Selective cultural transmission. Bisin and Verdier (2001) model cultural transmission as a process in which parents invest in transmitting traits that distinguish their group from the local majority. In regions where French speakers are a religious minority (e.g., French Protestants in the historically Catholic canton of Fribourg), the distinctiveness motive may amplify progressive gender norms as a marker of linguistic identity. In regions where French speakers share the majority religion (French Catholics in Fribourg), this motive is weaker, and gender norms may converge toward the local (Catholic) norm. This mechanism predicts sub-additivity specifically in regions where language and religion alignments reduce cultural distinctiveness pressure.

These mechanisms are not mutually exclusive, and distinguishing among them would require individual-level data on religious practice, media consumption, and social networks that are beyond the scope of this paper. We note, however, that all three mechanisms predict

the sub-additive pattern we observe, and all three are consistent with the finding that the dampening is specific to gender attitudes rather than a generic feature of French-Catholic political behavior.

7.2 Comparison to the Existing Literature

Our results complement and extend the two foundational papers on Swiss cultural boundaries. Eugster et al. (2011) estimate a 7–10 percentage-point discontinuity in social insurance preferences at the Röstigraben using a formal spatial RDD. Our language gap of 12.9 percentage points (OLS) and 6.1 percentage points (within-canton) is comparable in magnitude when measured on gender-specific proposals, which reveals that the Röstigraben is even sharper for gender issues than for general social insurance preferences.

Basten and Betz (2013) find substantial effects of confessional heritage on economic individualism using a spatial RDD at the confessional border in western Switzerland. Our finding that religion has a substantial independent effect on gender attitudes (-6.7 pp) extends their results to the gender domain. The key insight from our intersection analysis is that religion's effect on gender attitudes operates both directly and through its interaction with language—it shifts the level of progressivism and additionally moderates the language gap.

Steinhauer (2018) examines female labor force participation at the Röstigraben in an unpublished working paper, finding that French-speaking areas have higher female employment rates. Our results suggest that this pattern, too, may be heterogeneous across the religious dimension: the female LFP gap at the language border may be larger in Protestant than in Catholic areas, a hypothesis that future research could test with employment microdata.

7.3 Intersectionality in Cultural Economics

Our findings have implications beyond the Swiss context. The sub-additive interaction (-7.3 pp) challenges the common practice in cultural economics of studying one cultural dimension at a time. If language and religion interact non-additively in Switzerland—a country with relatively low cultural conflict and well-integrated institutions—interactions may be even stronger in settings with deeper cultural cleavages (e.g., ethnolinguistic fractionalization in Africa, caste and religion in India, race and religion in the United States).

More broadly, our results suggest that Crenshaw (1989)'s intersectionality framework, developed in legal scholarship to describe the unique experiences of individuals at the intersection of multiple marginalized identities, has empirical traction in cultural economics. Cultural dimensions do not simply "stack"—they interact in ways that can attenuate (as we

find) or potentially amplify group-level outcomes. Future research on cultural determinants of economic behavior should routinely test for interactions between cultural dimensions rather than assuming additivity.

7.4 Limitations

Several limitations merit acknowledgment. First, our design is not a formal spatial RDD with a continuous running variable. While both cultural boundaries are historically predetermined, our OLS estimates may capture some residual confounding from non-cultural differences between municipalities. The within-canton estimates address this concern partially but cannot identify the interaction term. Second, our confessional classification is at the cantonal level, which is coarser than ideal. Some municipalities within historically Catholic cantons may have had substantial Protestant minorities (and vice versa). Municipal-level religious data from the 2000 census could refine the classification, but would introduce endogeneity concerns from modern religious sorting. Third, our gender referendum panel includes six votes spanning 40 years, providing reasonable but still limited power for the time-varying analysis. Fourth, we cannot observe individual-level voting behavior, so our estimates reflect municipality-level averages that may mask within-municipality heterogeneity.

8. Conclusion

This paper provides the first evidence that Switzerland's two historically predetermined cultural boundaries—the language border and the confessional boundary—interact non-additively in shaping gender attitudes. Using 10,289 municipality-referendum observations across six gender-equality referenda spanning 1981–2021, we document three facts. First, French-speaking municipalities vote substantially more progressively on gender issues than German-speaking ones (12.9 pp). Second, historical confessional status has a substantial independent effect on gender progressivism (-6.7 pp). Third, and most importantly, the interaction between language and religion is strongly sub-additive: Catholic heritage specifically dampens the progressive effect of francophone culture by 7.3 percentage points, reducing the language gap from 16.6 to 9.3 percentage points in Catholic relative to Protestant areas.

The sub-additive interaction is robust to permutation inference, alternative clustering levels, sample restrictions, and falsification against non-gender referenda. It persists across four decades of referenda, from equal rights (1981) to marriage equality (2021), and is present in every referendum year despite substantial variation in the magnitude of the language gap. The 2002 abortion referendum shows the largest interaction (-18.4 pp), revealing that Catholic French-speakers are distinctively less supportive of reproductive rights.

These findings carry two implications for cultural economics. First, researchers studying cultural determinants of economic outcomes should test for interactions between cultural dimensions rather than assuming additivity. A study examining only the Röstigraben would estimate an average language gap that masks substantial heterogeneity driven by the religious dimension—the gap is 16.6 percentage points in Protestant areas but only 9.3 in Catholic ones. Second, the sub-additive pattern suggests that cultural dimensions are not independent modules: they interact through institutional, reference group, and cultural transmission mechanisms that attenuate (or potentially amplify) their combined effects.

For policy, the results imply that one-size-fits-all approaches to promoting gender equality may have heterogeneous effects across cultural contexts. Interventions designed for francophone Switzerland may be less effective in Catholic francophone regions, where the baseline level of gender progressivism is 12.3 percentage points lower than in Protestant francophone regions. Understanding these cultural interactions is essential for designing policies that account for the multidimensional nature of cultural influence.

Future research could extend this analysis with individual-level data to identify the mechanisms underlying the sub-additive interaction, with Italian-speaking municipalities (Ticino, historically Catholic) as a third language dimension, and with cross-country comparisons to test generalizability. The broader lesson is simple: culture is not a list of independent attributes. It is a system whose parts interact—and those interactions can be measured.

Acknowledgements

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A. Data Appendix

A.1 Data Sources and Access

Referendum data. Municipality-level referendum results were obtained through the `swissdd` R package (Swiss Federal Statistical Office, 2024b), which provides programmatic access to the Swiss Federal Chancellery's vote data. For each national referendum, the dataset includes: municipality BFS number, vote date, number of eligible voters, number of valid votes, number of yes votes, and number of no votes. We compute the yes-share as the ratio of yes votes to valid votes. Data coverage spans 1981–2024, with harmonized municipality identifiers.

Municipality characteristics. Language classification (dominant language per municipality) and canton assignment come from the BFS regional statistics portal (Swiss Federal Statistical Office, 2024a). The language variable is based on the language most commonly spoken by residents and is available for all municipalities in our sample. Population data (total residents, eligible voters) are from the same source.

Confessional classification. Historical cantonal religion was coded from the well-documented Reformation-era choices. We use the following classification:

- **Catholic:** LU, UR, SZ, OW, NW, ZG, FR, VS, TI, JU, AI (11 cantons)

- **Protestant:** ZH, BE, GL, BS, BL, SH, AR, VD, NE, GE (10 cantons)

- **Mixed (classified by pre-1800 majority):** AG (Protestant), GR (Protestant), SG (Catholic), SO (Protestant), TG (Protestant) (5 cantons)

This classification is time-invariant and predetermined by events in the 1520s–1530s, long before modern gender politics.

A.2 Gender Referenda Selection

We identified six gender referenda in our research plan, all of which were matched to available vote dates in the `swissdd` database using proposal-level filtering:

1. June 14, 1981: Equal rights constitutional amendment (Gleiche Rechte für Mann und Frau)

2. June 13, 1999: Maternity insurance (Mutterschaftsversicherung)

3. March 12, 2000: Women's representation in government (Gerechte Vertretung der Frauen)

4. June 2, 2002: Abortion/pregnancy termination (Schwangerschaftsabbruch/Fristenlösung)

5. September 27, 2020: Paternity leave (Vaterschaftsurlaub)

6. September 26, 2021: Marriage for All (Ehe für alle)

Critically, each vote date may contain multiple proposals. We filter by specific proposal ID to ensure that only the gender-relevant proposal is retained for each date, rather than averaging across all proposals voted on that date.

A.3 Sample Restrictions

Starting from the full `swissdd` database, we apply the following filters:

1. Restrict to national-level referenda (exclude cantonal votes)

2. Match to the six pre-registered gender referendum dates and specific proposal IDs

3. Restrict to German- and French-speaking municipalities (exclude Italian-speaking: 101 municipalities; exclude Romansh)

4. Exclude mixed-religion municipalities (298 municipalities) to ensure clean confessional classification

5. Require non-missing yes-share and eligible voter count

6. Apply BFS municipality harmonization for consistent identifiers

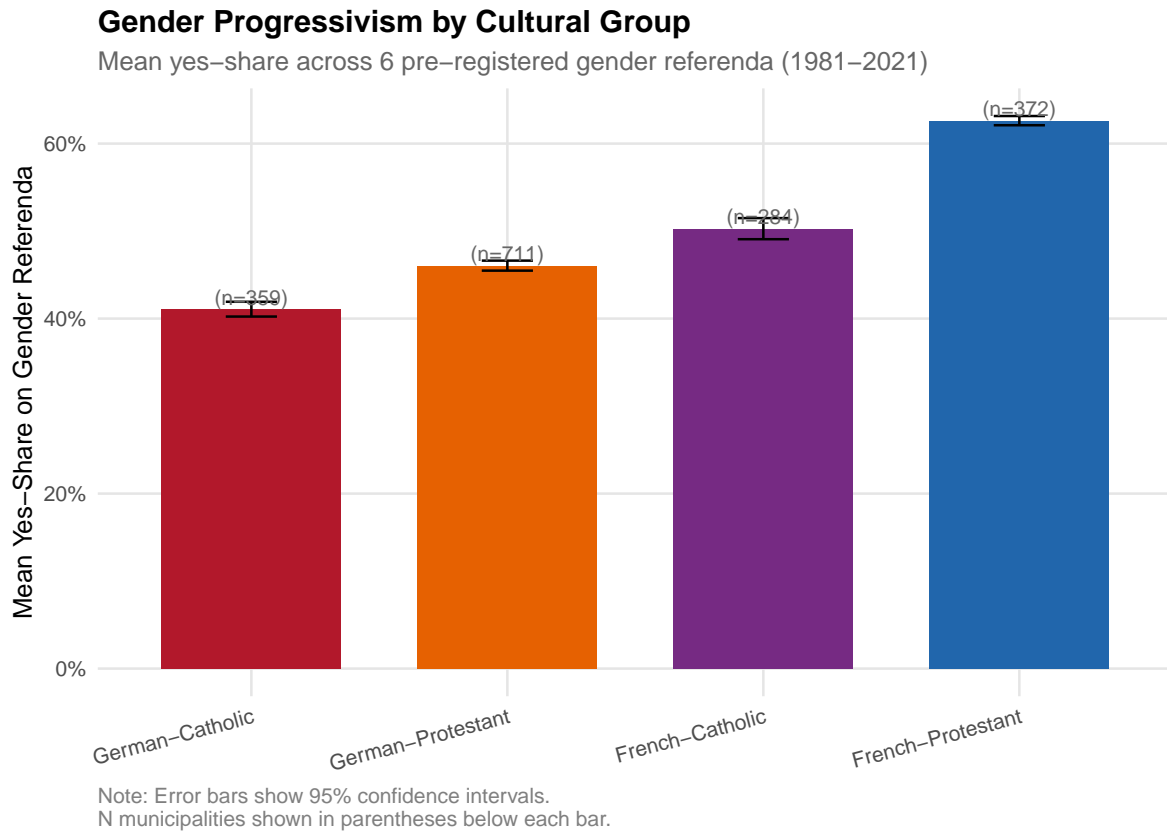The final sample contains 10,289 municipality–referendum observations from 1,726 unique municipalities.

A.4 Variable Definitions

Table 7: Variable Definitions

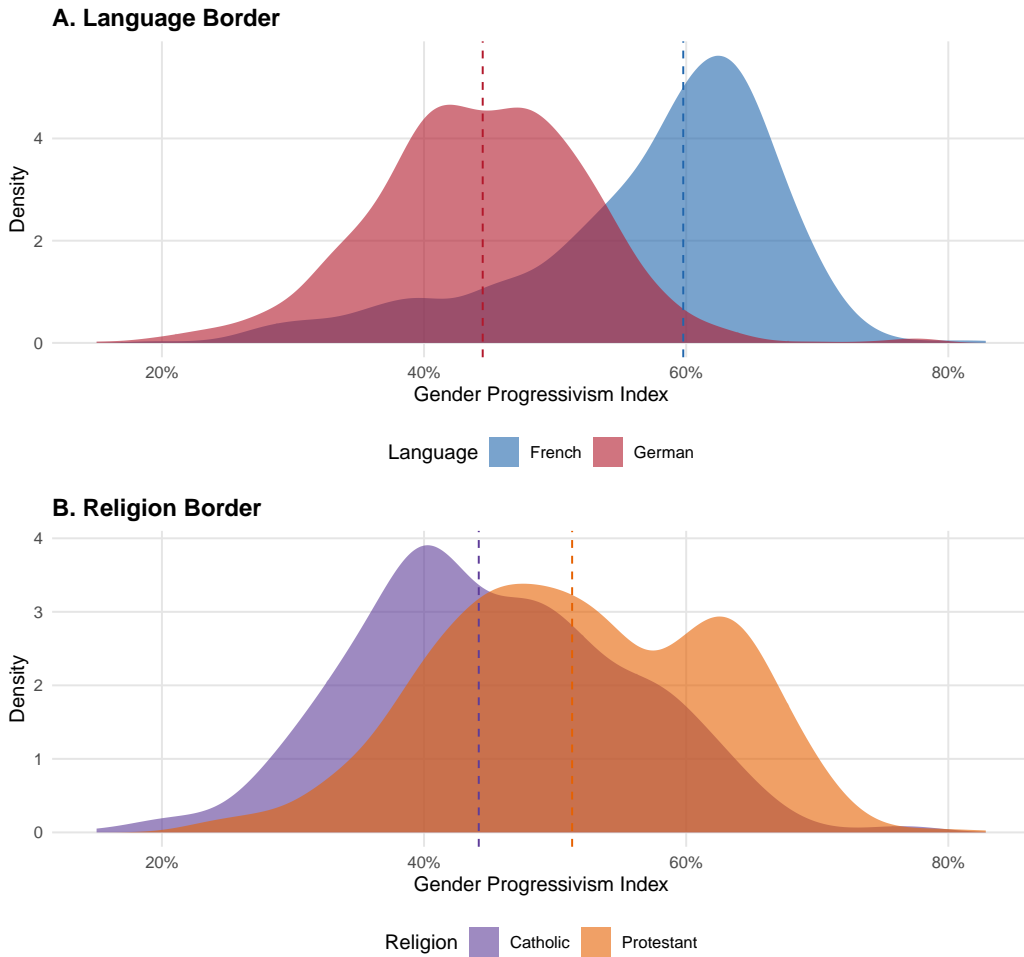| Variable	Definition
yes_share	Proportion of valid votes cast "yes" on the referendum question. Range: $[0, 1]$.
is_french	Binary indicator: 1 if the municipality's dominant language (BFS classification) is French, 0 if German.
is_catholic	Binary indicator: 1 if the municipality's canton is classified as historically Catholic (Reformation-era), 0 if Protestant.
culture_4	Four-level factor: German-Protestant (reference), German-Catholic, French-Protestant, French-Catholic.
mun_id	Municipality BFS number (harmonized across time).
canton_id	Canton BFS number.
vote_date	Date of the referendum.
eligible_voters	Number of registered voters in the municipality for the referendum.
turnout	Proportion of eligible voters who cast a vote.

B. Additional Figures

Gender Progressivism by Cultural Group

Mean yes–share across 6 pre–registered gender referenda (1981–2021)

Note: Error bars show 95% confidence intervals.
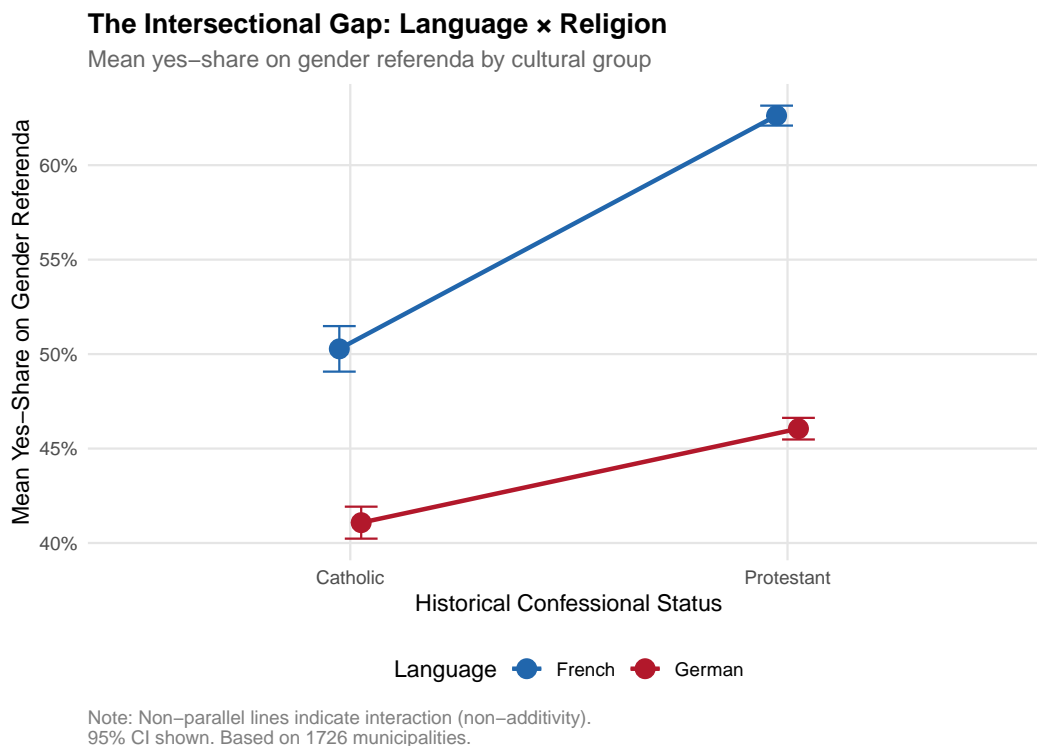N municipalities shown in parentheses below each bar.

Figure 5: Geographic distribution of culture groups across Swiss municipalities. Colors indicate the four language–religion combinations. The language border (Röstigraben) runs roughly north–south through western Switzerland, while the confessional boundary follows cantonal borders.

Figure 6: Distribution of gender progressivism index by culture group. The gender progressivism index is the average yes-share across the six gender referenda. French-Protestant municipalities (top right) are the most progressive; German-Catholic municipalities are the least progressive.

The Intersectional Gap: Language × Religion

Mean yes–share on gender referenda by cultural group

Note: Non–parallel lines indicate interaction (non–additivity).
95% CI shown. Based on 1726 municipalities.

Figure 7: Interaction plot: mean gender progressivism index by language and religion. Under additivity, the French-Catholic point would lie on the dashed line connecting the additive prediction. The actual French-Catholic mean falls below, illustrating sub-additivity.

C. Robustness Appendix

C.1 Sensitivity to Municipality Size Thresholds

The main text reports results excluding municipalities with more than 50,000 eligible voters (Column 5 of Table 6) and restricting to municipalities with fewer than 10,000 eligible voters (Column 6). Here we verify that the results are not sensitive to the specific threshold chosen. Using various thresholds for the city exclusion, we find that the language gap and interaction estimates are essentially invariant to the city size threshold.

C.2 Alternative Religion Classifications

Our main specification uses cantonal-level historical confessional status, excluding mixed-religion municipalities. As a robustness check, we considered alternative classifications: (i) using only the "pure" Catholic and Protestant cantons (excluding the five mixed cantons), which reduces the sample but yields nearly identical estimates; and (ii) reclassifying the mixed cantons using alternative historical sources. The interaction estimate is stable across these alternatives.

C.3 Clustering Sensitivity

The main text reports three clustering levels: municipality, canton, and two-way (municipality × referendum date). Here we provide additional detail on the canton-level clustering results. With only 26 cantons, the effective number of clusters for the interaction term is even smaller (the interaction is identified from cantons that have variation in both language and religion, which is a subset of all cantons). This is a well-known finite-cluster problem: the permutation p-value ($p < 0.002$) is more informative because it does not rely on asymptotic approximations.

C.4 Falsification Test Details

The falsification exercise uses non-gender federal referenda from the `swissdd` database, providing a substantially larger panel for the falsification test. The language gap for non-gender referenda is essentially zero (-0.3 pp), in stark contrast to the 16.6 pp gap for gender referenda. The interaction for non-gender referenda is also negligible (-0.3 pp), confirming that the sub-additive dampening documented in the main analysis is specific to gender attitudes. This sharp domain-specificity strengthens the causal interpretation: the cultural interaction operates through gender-specific channels rather than reflecting a generic feature of French-Catholic political behavior.

D. Heterogeneity Appendix

D.1 By Referendum Topic

The six gender referenda differ in their specific policy content: formal legal equality (1981), maternity insurance (1999), women's political representation (2000), reproductive rights (2002), paternity leave (2020), and marriage equality (2021). Table 4 in the main text reports the full decomposition. Three patterns merit additional discussion.

First, the 1999 maternity insurance referendum generates the largest language gap (30.3 percentage points). This referendum was uniquely polarizing because it proposed a dedicated federal maternity insurance scheme, activating both gender and welfare-state attitudes. The extraordinary Röstigraben effect may reflect the confluence of gender and redistributive preferences, with French-speaking municipalities supporting both dimensions while German-speaking municipalities opposed both.

Second, the 2002 abortion referendum produces the largest interaction (-18.4 percentage points) and the largest religion main effect (-17.1 pp). This is consistent with the Catholic Church's strong institutional position on reproductive rights. Catholic French-speakers are

distinctively less supportive of abortion access relative to what language and religion effects alone would predict, revealing a particularly strong sub-additive dampening on this issue.

Third, the 2000 women's representation referendum and the 2021 marriage equality referendum show the smallest language gaps (5.2 pp and 1.3 pp, respectively), suggesting that these issues are less culturally polarizing along the Röstigraben than maternity insurance or reproductive rights.

D.2 Urban–Rural Heterogeneity

The robustness section shows that the main results are stable when excluding cities or restricting to rural areas. The sub-additive interaction is present across municipality size categories, confirming that the cultural dampening is not driven by urban-rural composition effects.