sociological science

The Sequential Rise of Female Religious Leadership

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Abstract: In his seminal work "Ordaining Women," Mark Chaves (1997b) highlighted the phenomenon of "loose coupling" regarding female religious leadership: congregations often display inconsistencies between their stated policies and actual practices. Some congregations declare openness to female leadership but do not practice it, whereas others officially forbid female leadership yet have women in leadership roles. Our article identifies a theoretical mechanism producing this inconsistency. We propose that congregations typically first loosen their formal rules governing female access to leadership and only later allow women to occupy leadership positions in practice. This two-stage process results in a temporal lag between rule change and practice change, creating the observed "loose coupling," where rules are often more gender egalitarian than practice. Using two waves of the National Congregation Survey Switzerland covering all religious traditions, we test our theory both on the aggregate and the unit level and find strong support for it. Simulations further indicate that certain characteristics of the organizational population of congregations, such as their low attrition rate, may explain a large part of the lag between rule change and practice change.

Keywords: female leadership; congregations; loose coupling; sociology of organizations

Reproducibility Package: A replication package with instructions, data, and R-code has been made publicly available on the Open Science Framework (OSF): https://osf.io/qhb5d/

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THE question of women's access to leadership in religious organizations is the subject of passionate debate, both within religions and among the general public (De Gasquet 2009; Willaime 1996). As many observers have noted, the religious field is one of the most patriarchal social areas of western societies (Lee 2024). It exhibits more explicit barriers inhibiting female leadership and shows less female leadership than most other social areas (Chaves 1997a). In many religions, the followers are predominantly female, whereas the clergy is overwhelmingly male (Stolz and Monnot 2019). Several studies have found that when women occupy leadership roles within congregations, they frequently find themselves in subordinate leadership roles, either in terms of their position or in terms of the resources of the congregation they lead (Chaves, Roso, and Hawkins 2021; Lee 2024). This situation is often described as a "stained glass ceiling," which prevents women from accessing religious leadership positions (Adams 2007; Sullins 2000).

Following the seminal work by Chaves (1996, 1997b), the literature on female religious leadership has accepted the proposition of "loose coupling" between access rules and practice regarding female religious leadership. According to this proposition, access rules serve more as symbolic signals for or against gender equality, rather than as policies actually organizing women's roles. In particular, Chaves draws on the fact that we find denominations that formally prevent women from occupying leadership positions, but in which women practically act as leaders

or pastors; just as we find denominations upholding complete openness to female leadership when in fact no women can be found in the power positions.

This article identifies a mechanism explaining loose coupling. According to this theory, congregations and denominations in a first period loosen their rules governing female access to leadership, and in a second period, they follow up with filling open positions with both men and women. Both the first and second stages need considerable time. The two-stage process creates much of the "loose coupling."

The goal of this article is to describe the evolution of female leadership in Swiss congregations across all religious traditions between 2009 and 2022. Specifically, we answer the following questions:

1. How have the access rules regulating women's leadership in Swiss congregations changed from 2009 to 2022?

2. How has the practice of female leadership evolved in these congregations in the same timeframe?

3. How are changes in rules and the practice of female leadership related? Specifically, is there a pattern in how the inconsistency ("loose coupling") between access rules and practices emerges and disappears? If so, what mechanisms are responsible for such a pattern?

To answer these questions, we use two waves of the National Congregation Survey Switzerland (NCSS). NCSS data build on a representative sample of congregations across all religious traditions, where one key informant per congregation is interviewed concerning easily observable attributes and activities of the respective congregation. We also use simulations showing how much "loose coupling" is created by the sequential mechanism and how fast (or rather: slow) the process of "filling up" positions with women will be under different conditions.

To gain clarity, we briefly review our definitions: In this article, congregations are defined as local religious groups (see for an operational definition below). Denominations are organizations federating local religious groups of the same religious tradition or subtradition. A religious tradition is an ensemble of similar religious and cultural beliefs and practices on a very abstract level (e.g., "Christianity," "Islam," and "Buddhism").

We distinguish between access rules concerning female leadership and the practice of female leadership in religious groups. Access rules specify what roles women can in theory occupy within the group. By the practice of female leadership, we mean the role actually occupied by women in the religious group, in practice and independently of the rules in vigor. We define a social mechanism as a "constellation of entities and activities, typically actors and their actions, that are linked to one another in such a way that they regularly bring about the type phenomenon we seek to explain" (Hedström 2005:2).

An inconsistency ("loose coupling") between access rules and the practice of female religious leadership takes two forms. In one case, a congregation proscribes female religious leadership but nevertheless is led by a woman ("inconsistency on the conservative side"). In the other case, the congregation allows female religious

leadership but does not show gender parity of leadership in practice ("inconsistency on the liberal side"). Although inconsistency on the conservative side is straightforward and measurable on the unit (congregational) level, inconsistency on the liberal side can only be ascertained in the aggregate. This is because allowing female leadership but having a male leader is not necessarily inconsistent for a single congregation. However, on the aggregate level, we can calculate the difference between the percentage of female leaders and parity (50 percent), which gives us the aggregate degree of inconsistency.

The contribution of our article is threefold. (1) We contribute to the general sociology of religion by identifying a female religious leadership sequence and showing that this is a mechanism partly explaining loose coupling. (2) We add to the specific literature on religious leadership in European countries and specifically in Switzerland. (3) Finally, we add a new example to the literature on social mechanisms in analytical sociology.

State of the Art

Previous Research

A large body of research has shown that even in the presence of egalitarian access rules, women may be strongly underrepresented in congregational leadership positions. This research can be summarized as follows:

1. Women are vastly underrepresented in congregational leadership in general (De Gasquet 2009; Schleifer and Miller 2017; Stolz and Monnot 2019).

2. Women are even more underrepresented in the highest leadership roles (Knoll and Bolin 2018; Wood 2019). They frequently find themselves in subordinate leadership positions. Typically, they are found as the church's music director, children's minister, or administrative positions (Hoegeman 2017).

3. Women are significantly better represented in leadership positions within financially challenged or smaller congregations (Chaves et al. 2021; Hoegeman 2017; Lee 2024).

On the question of women's ordination, Chaves (1997a) argues that access rules "neither reflect nor shape the tasks and roles women actually perform in congregations as closely or directly as might be expected." He has three main points in support of this thesis. (1) There is a marked lag between the timing of changes in denominational formal rules and trends in the proportion of women clergy. The proportion of denominations ordaining women increased throughout the twentieth century in a relatively linear fashion, whereas the proportion of women among the American clergy did not really take off until the 1970s. (2) In many denominations, the practice of female leadership is more permissive than its access rules. Although such denominations do not ordain women, women still often act as pastors or priests in practice. (3) In many other denominations, however, the access rules of female leadership are more permissive than the practice. These denominations may even adopt an official and written policy of full formal gender

equality, but positions of power are in fact not or very seldomly distributed to women. Therefore, according to Chaves (1997a), formal rules regarding women's ordinations are "better understood as symbolic display of gender equality (or of resistance to gender equality) than as a policy either motivated by or intended to regulate the day-to-day reality of women inside the organization."

Theory

Our theory consists of two propositions and two hypotheses that can be derived from the propositions.

> (P1) Swiss society is increasingly focused on gender equality. This creates increasing pressure on religious congregations to align with these values by demonstrating egalitarian access rules and ensuring equal participation of women and men in leadership positions.

Over the past few decades, gender equality norms gained legitimacy in post-industrial societies (Inglehart and Norris 2003), including in Switzerland (Bornatici, Gauthier, and Le Goff 2020). Several indicators show that gender equality has made progress in Switzerland between our two waves. According to OECD (2024) data, the gender pay gap fell from 20.1 percent in 2010 to 13.8 percent in 2020 and the proportion of women on the boards of the largest companies rose from 17.5 percent to 33.5 percent between 2016 and 2022. The proportion of women in parliamentary chambers rose from 28.5 percent to 42.5 percent between 2009 and 2022 (SFO 2023). Furthermore, attitudes among the Swiss population have evolved toward a greater commitment to gender equality (Bornatici, Gauthier, and Le Goff 2021).

The religious sphere in post-industrial countries is not immune to these normative pressures. In *Ordaining Women*, for example, Chaves (1997b) shows how normative pressures for gender equality go a long way in explaining why so many American denominations have adopted gender equality in their formal rules for women's leadership over the past century.

> (P2) Religious congregations tend to respond to the pressure of gender equality in a sequence: initially by relaxing rules that limit women's access to leadership roles, followed by a second phase in which women actively participate in positions of authority.

The sequence arises from a situation where an organization has incumbents whose mandates or roles are generally long term. Once the official rules of the group allow the participation of a new type of actor (here: women), it takes time to fill the positions. In practical terms, if pastors in a large denomination remain in their roles for the duration of their careers, achieving gender equality in leadership could take decades, even with the introduction of a fully egalitarian access policy. The arrival of the new player in the game can also be slowed down by the internal resistance of established players and the "informal rules of the group." Informal group rules are rules that explain how official rules are to be applied in practice and often give established players significant flexibility (Stolz 2023).

From these propositions, we derive two testable hypotheses.

H1 Overall, both the access rules and the actual distribution of positions of power within congregations move toward greater gender equality between 2009 and 2022 in Switzerland.

H2 Congregations without rule equality in 2009 will tend to adopt rule equality in 2022, but they will not show an increase in the practice of female religious leadership in 2022. Congregations that had rule equality in 2009 will maintain it in 2022 and they will tend to increase the practice of female leadership in 2022.

Note that our model only accounts for inconsistencies between rule and practice of female religious leadership "on the liberal side." Any inconsistency "on the conservative side," that is, where women are leaders despite a rule that forbids female leadership, is to be seen as deviations from our model.

Data

The data used in this article are from two waves of the NCSS, which both followed the methodology explained below.

Sampling

In each wave, the first step was to establish a comprehensive census of Swiss congregations across all religious traditions. The first wave census was conducted in 2008, whereas the second census was conducted in 2020/2021. In both cases, Chaves' definition of congregations provided the criteria for including religious communities in the census:

> "a social institution in which individuals who are not all religious specialists gather in physical proximity to one another, frequently and at regularly scheduled intervals, for activities and events with explicitly religious content and purpose, and in which there is continuity over time in the individuals who gather, the location of the gathering, and the nature of the activities and events at each gathering" (Chaves 2004:1).

To identify active congregations that match these criteria, all available sources were employed: existing lists compiled by federations or specialists, websites, direct contact with congregations, and snowball sampling. We then had our list verified by multiple academic and religious experts. The 2008 census listed 6,341[1] congregations, whereas the 2020/2021 census found 5,834 congregations.

For both NCSS waves, the next step was to draw a random sample from the census. For both waves, we stratified for religious tradition and oversampled minority religious traditions. For the second wave, we also sampled all environment-friendly congregations.

Questionnaires for the first wave were administered in 2009, whereas those for the second wave were administered in 2022. We reached 1,022[2] participants in 2009

and 1,395 participants in 2022, which sums up to 2,417 congregations in total. We use weights to adjust for oversampling and unequal response rates of different religious traditions.

Data Collection

For each sampled congregation, we conducted computer-assisted telephone or web interviews with a key informant[3], in the vast majority of cases the spiritual leader of the community. Interviewees were asked approximately 200 questions. In the second wave, we mainly repeated the same questions as in the first wave.

In the first wave, we obtained a response rate of 60.9 percent, whereas in the second wave, the response rate was 45.4 percent. This decline in response rates is unsurprising, as telephone surveys have generally experienced higher non-response rates in recent years due to changes in technology and communicative behavior (Czajka and Beyler 2016).

Dependent Variables

To assess access rule openness to female leadership, we use five items, each receiving a binary response (1 = yes, 0 = no). These questions ask whether the congregation allowed qualified women to (1) be full members of governing bodies or coordinating committees, (2) be head of clergy or senior religious leader, (3) preach at a main worship service, (4) teach a class with adult men in it, and (5) hold all volunteer leadership positions that are available to men. The question whether women could be the head of clergy or senior religious leader is especially important in many of our analyses.

For some analyses, the items were combined by simple addition to form a score. The score ranges from zero, indicating the lowest level of openness, to five, indicating the highest level of openness. The variables used to derive the score have a Cronbach's α of 0.76, indicating satisfactory internal consistency.

We assess the practice of female leadership based on two measures: the gender of the main clergyperson and the proportion of women on the congregation's board.

For the first measure, we asked: "Is there one person who is the spiritual leader of your congregation — a priest, senior pastor, spiritual guide, etc.?" (yes/no). If the respondent answered "yes," we then asked: "Is this person male or female?"

The presence of a management board or committee and the percentage of women on it were assessed using the following three questions (1) "Is your congregation managed by a council or a board of management that is responsible for strategies and objectives within the congregation?" (yes/no), (2) "How many people sit on this council/board?" and (3) "how many of these are women?"

Independent Variables

Because our aim is to measure changes over time, our main independent variable is the year the survey took place (2009/2022), which we treat as a nominal variable.

Another independent variable is the congregations' religious tradition. We use a 12-level religious tradition variable. It has the following categories: (1) Roman Catholic, (2) Reformed Protestant, (3) classical Evangelical, (4) charismatic Evangelical, (5) conservative Evangelical, (6) Orthodox Christian, (7) other Christian, (8) Jewish, (9) Muslim, (10) Buddhist, (11) Hindu/Sikh, and (12) "others."[4]

Our section about the gender equality sequence in denominations establishes denominations as the unit of analysis. This variable was collected during the censuses. When a congregation was identified, we simply noted to which denomination it belonged. For the analyses in question, we used only the 13 denominations for which we had at least nine observations for each dependent variable used and each wave. Details of these denominations, such as religious tradition, sample size, and denominational averages on dependent variables are shown in the online supplement (Table A2).

Analytical Strategy

For all analyses, we used R (version 4.4.2). For replication purposes, we have uploaded a replication package on OSF: https://osf.io/qhb5d/.

To analyze national trends regarding access rules and practice, we calculate weighted averages for all dependent variables in 2009 and 2022. This analysis is further broken down by religious tradition.

When modeling the rule–practice sequence, we focus on two dependent variables: for rules, we use the item "Women may be the main clergy person," and for practice, we use the item "Main clergy person is a woman."[5]

To model the rule–practice sequence on the denominational level, we investigate the relationship of denominational averages of rules and practices in 2009 and 2022. To do so, we use multivariate beta regressions on both our dependent variables in a Bayesian framework. We use beta regressions because our two dependent variables are continuous with an open unit interval (0, 1) (Grün, Kosmidis, and Zeileis 2012). We use a Bayesian approach because our sample size is quite small ($N = 13$). We use the r package brms (Bürkner 2017), which in turn uses stan (Carpenter et al. 2017).

To model the rule–practice sequence on the congregational level, we cross tabulate the four logical rule–practice possibilities for a congregation in 2009 with the four logical possibilities for a congregation in 2022. We take advantage of the fact that the rule–practice sequence only allows certain cells and forbids others. This allows conducting an exact test for a Bernoulli experiment, where the null hypothesis states that the true probability of success (i.e., a case falling into an allowed cell) is less than or equal to a chosen percentage of the expected success (we use $p = 0.9$).

The simulation allows estimating the extent of liberal side inconsistency over time under four different assumptions.

We use two weighting variables: population weights and covariate weights. The population weights allow adjusting for bias due to unequal response rates in religious tradition and oversampling of small religious traditions as well as "green" congregations (congregations with a special emphasis on environmental action). These weights were created based on the distribution of our comprehensive

Table 1: National averages for measures of access rules and actual female leadership by year.

Variable	Population Weights		Covariate Weights	
	2009	2022	2009	2022
Access rules: Women may be . . . (%)				
Main clergy person	47.8	54.0*	53.0	58.0*
Preaching at a main worship	65.8	75.9**	70.4	76.4**
Board member	90.0	92.7*	93.6	92.9
Holding all volunteer leadership positions	87.8	91.1*	90.3	91.2
Teaching in class with men	91.3	93.9*	94.6	93.6
Practice: actual female leadership (%)				
female leading clergy person	12.3	14.7	13.5	16.5*
women on board	41.2	42.7	42.9	42.7

Note: $^{*}p < 0.05$, $^{**}p < 0.01$.
"Population weights" averages were computed using the population weights and "covariate weights" averages use the covariate weights. Stars show the statistical significance of the survey year effect, based on weighted regression models where each variable is treated as the dependent variable and survey year is the only predictor. For all variables except for "% women on board," for which we used ordinary least squares (OLS) regression and logistic regressions.

censuses of congregations. The covariate weights are used in some analyses when we analyze changes between 2009 and 2022. They ensure that the samples from both waves have approximately the same distribution of covariates for our main dependent variable. This reduces the risk of compositional effects. Religious tradition (12 levels), number of regular attenders, and theological position (conservative/medium/liberal) were used to construct the covariate weights.

For all the variables used, the missing values—between 1.4 percent and 11.7 percent depending on the variable—were imputed by chaining random forests (using the R package missRanger). Table A3 in the online supplement shows the percentage of missing values in the original data set for each variable. All our results are substantially the same without imputation.

Results

Trends Regarding Female Religious Leadership in Rules and Practice

Overall, we find that both the access rules and the practice of female religious leadership have moved toward greater gender equality in Switzerland between 2009 and 2022. Table 1 provides the weighted averages for each dependent variable in 2009 and 2022. The "population weights" columns display estimates for the actual population, whereas the "covariate weights" columns apply covariate weights, minimizing the risk of compositional effects.

Regarding access rules, the percentage of Swiss congregations claiming that the main clergy person may be a woman has increased from 47.8 percent to 54.0 percent, whereas the percentage allowing women to preach at a main worship service has

increased from 65.8 percent to 75.9 percent. These two increases are significant regardless of the weights used.

The items measuring women's access to the board, holding volunteer leadership positions, and teaching classes with men have slightly increased. As these increases are no longer significant when covariate weights are used, we suspect that they are related to the unequal distribution of covariates between the two waves.

When it comes to the practice of female religious leadership, both our indicators also show an increase in gender equality.

The percentage of Swiss congregations where the main clergy is a woman increased from 12.3 percent to 14.7 percent and the mean percentage of women in congregations' board increased from 41.2 percent to 42.7 percent. The difference regarding the gender of the main clergy is only significant when using the covariate weights. Covariates being held constant, congregations have become more likely to be led by women.

Table A4 in the online supplement gives the estimated population averages of our dependent variables for access rules and practice in 2022 and the percentage differences between 2009 and 2022 for every religious tradition separately. At this point, we highlight the following three key points:

1. Religious traditions differ greatly from one another, both in terms of rules and practice. Buddhists, other religions, and Reformed Protestant are the most open traditions regarding female religious leadership and Evangelical Conservatives and Orthodox Christians are among the most closed. Religious traditions' "ranking" in these matters are roughly similar in 2009 and 2022.

2. Most of the changes—and all statistically significant changes—are moving toward greater gender equality. It is among evangelicals that we find the strongest increases. For conservative Evangelicals, we find an increase of 22.6 percent of congregations that allow women to teach a class with men and an increase of 16.3 percent where women may be board members. For classical evangelicals, we find an increase of 6.5 percent of women on the board and 10.4 percent of female spiritual leaders.

3. A note on Catholics: the proportion of Catholic parishes led by women has doubled from 3.6 percent to 7.6 percent. This is not due to an inflexion on the part of the Vatican regarding the ordination of women, but rather to a worsening shortage of Catholic priests. From 2011 to 2021, the number of diocesan Catholic priests fell from 1,099 to 845 (Schweizerisches Pastoralsoziologisches Institut 2021). In the absence of available priests, pastoral assistants manage a growing proportion of Catholic parishes. These pastoral assistants can be women, and the proportion of women among them has increased.

The Gender Equality Sequence

Our second hypothesis (H2) postulates that inconsistency in rules and practice of female religious leadership emerges because of a sequence: first, congregations will relax their rules; then they will switch to female religious leadership in practice.

Table 2: Type of loose coupling in 2009 and 2022.

Year	Allow Female Clergy (Type of Loose Coupling)	Congregations *N*	Actual Women *N*	Expected Women *N*	Inconsistency *N*	Inconsistency %
2009	Yes (liberal side)	488	107	244	137	88.1
2009	No (conservative side)	534	19	0	19	11.9
2022	Yes (liberal side)	753	171	377	205	85.9
2022	No (conservative side)	642	34	0	34	14.1

Note: Counts are computed using the population weights. Results are very similar when using the covariate weights. The last column shows, for each year, the percentage of the observed loose coupling attributable to each type of loose coupling.

Before testing this hypothesis, it is useful to consider the extent of loose coupling both in 2009 and 2022.

Table 2 shows the proportion of loose coupling attributable to each type of inconsistency for each year. For example, we see that among the 488 congregations that in principle permit female religious leadership in 2009, only 107 have a female leader. Under tight coupling on the liberal side, we would expect half (244) of those congregations to be led by a woman, which means that there are 137 "inconsistent congregations on the liberal side." If we compare this number with the number of "inconsistent congregations on the conservative side," we see that inconsistency on the liberal side is much more common (liberal: 88.1 percent vs. conservative: 11.9 percent). In 2022, we find a rather similar distribution with 85.9 percent of inconsistencies on the liberal side versus 14.1 percent on the conservative side.

Testing the sequence on denomination-level data. We test H2 in two ways. The first test uses an aggregated repeated cross-sectional data set at the denominational level. To have reliable denominational means for our two dependent measures, we retain only denominations for which we have at least nine observations per wave for each of the two dependent measures. The resulting subset comprises 1,496 observations, from 13 different denominations. As shown in the online supplement (Table A5), the subset is relatively close to the full data set according to our dependent variables and represents about 60 percent of our full sample. However, it should be noted that due to our conditions of inclusion, our subsample over-represents large denominations. As a result, it is biased, notably in terms of religious traditions, and only includes Christian denominations. On the other hand, the subsample broadly covers Christian diversity: it includes the Roman Catholic, Old Catholic, Reformed and Methodist churches, as well as four New Pietist denominations, the Salvation Army, a Pentecostal denomination, a Darbyst denomination, the New Apostolic Church, and the Seventh-day Adventist Church.

Visually, our hypothesis of a two-step sequence for female religious leadership is very well borne out. Figure 1 shows for every included denomination the rule–practice combination of female religious leadership in 2009 (base of the arrow) and 2022 (tip of the arrow). As shown in Figure 1, denominations that started from a low level of rule equality in 2009 almost always see this level of equality increase, without, however, increasing their practice equality (e.g., Evangelical Free Assembly

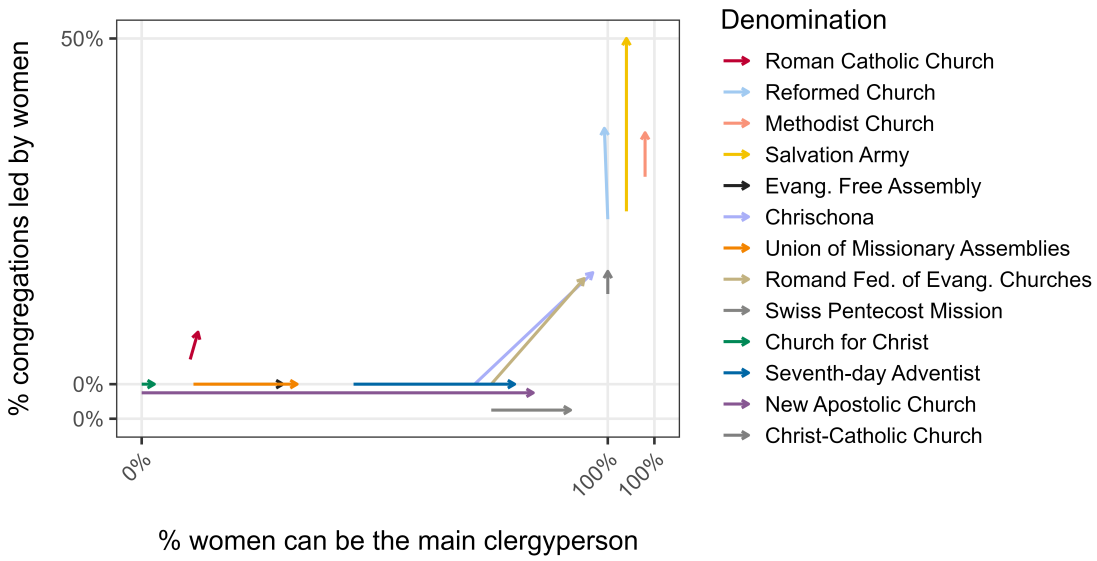

Figure 1: Rules and practice of female leadership in 2009 and 2022. *Note*: (1) The base of the arrow represents 2009 percentages, whereas the tip represents 2022 percentages. (2) Percentages and sample size for each denomination are available in the online supplement (Table A2). (3) For better visibility, we show an area instead of a line representing 0 percent on the x and y axes.

and New Apostolic Church).[6] These are the horizontal arrows going from left to right. On the other hand, among denominations that started out already with a high average level of rule equality, it is the practice of female religious leadership that increases, without any reverse change in rule equality (e.g., Salvation Army and Reformed congregations). These are the vertical arrows going up.

The one notable exception is the Roman Catholic Church. Here, we see a slight rise both in rule equality and practice equality, both on a very low level.

In this case, as shown above, women are taking on more leadership roles due to the shortage of priests within this denomination, without the denomination having changed its formal rules regarding female leadership. We conjecture that this exceptionality is linked to the singular situation of the Roman Catholic Church with regard to female religious leadership: officially, it does not allow female priests, but at the same time it has to cope with a very serious shortage of male priests.

We model the female leadership sequence on the denominational level with multivariate beta regression models in a Bayesian approach.

In our multivariate model, we have two dependent variables: The rule that women may be leaders of the congregation in 2022 ("Rules"), and the assertion that women are the leaders of the congregation in 2022 ("Practice"). We estimate the following two equations:

$$g(\mu_{T1i}) = \alpha_1 + \beta_1 x_{T0i} + \beta_2 y_{T0i} + \varepsilon_1,$$
$$g(\eta_{T1i}) = \alpha_2 + \beta_3 x_{T0i} + \beta_4 y_{T0i} + \varepsilon_2,$$

where $g(.)$ is a logit link function, that is, $g(\mu_i) = (\mu_i/(1-\mu_i))$; μ_{T1i} is the mean of the response variable x_{T1i}, which lies in the interval (0, 1) and corresponds to Rules

in 2022; η_{T1i} is the mean of the response variable y_{T1i}, which lies in the interval (0, 1) and corresponds to Practice in 2022; α_1 and α_2 are intercepts; β_1 to β_4 are the coefficients of interest; and ϵ_1 and ϵ_2 are error terms.

Results are given in Table 3. Model 0 is the baseline model and does not include any predictors. Model 1 introduces the "Rules 2009" independent variable. Model 2 includes both the "Rules 2009" and "Practice 2009" independent variables[7]. In model 1, we see that the "Rules 2009" variable has a large and significant effect both on the "Rules 2022" and "Practice 2022" variables. However, when we introduce both Rules 2009 and Practice 2009 in model 2, it becomes clear that "Rules 2009" only significantly influences "Rules 2022" and "Practice 2009" only significantly influences "Practice 2022." The fit indices show that model 1 gives a much better fit than model 0 and model 2 gives a better fit than model 1. Substantively, this means that denominations that are still on the upswing of normative openness ("Rules") will only further increase in normative openness. Once they have achieved such an openness, they can increase in the practice of female leadership. In other words, these results show the statistical significance of the sequence we have graphically observed.

Testing the sequence on congregation-level data. Aggregate analyses have the drawback of possible ecological fallacy (Freedman 2001). It might be, in other words, that while the aggregate results seem to show a clear-cut sequence, the underlying individual congregations behave in fact quite differently. To rule out this possibility, we conduct a second test with the help of a subsample of 274 congregations surveyed both in 2009 and 2022. This longitudinal data set allows testing whether the observed congregations behave as predicted.

Table 4 tabulates the four logical rule–practice possibilities for a congregation in 2009 with the four logical possibilities for a congregation in 2022. For example, a congregation might in 2009 be rule liberal (allowing female leadership) and having a female leader. Such a congregation might stay with the same combination (it would then be counted in the cell (1,1)), or it might move to three other cells: (1,2), (1,3), or (1,4). Thus, there are 16 logical possibilities of movements between 2009 and 2022.

However, our sequential model permits only specific cells, which are shaded gray. We see that our empirical cases overwhelmingly (with $259/274 \approx 94.5$ percent) fall into exactly these cells.

To understand more clearly why our model only allows the cells shaded in gray, consider the following. If our model holds, congregations should either have stayed with their previous positions or should have moved along the rule–practice sequence. That is, if they did not allow female religious leadership and did not have a female leader in 2009, they should either stay that way (cell 4,4, step 1) or change to a situation where they have a rule allowing female religious leadership but do not have a female leader in practice (cell 4,2, step 1). If, in 2009, they had the rule of allowing a female leader but did not have a female leader in practice, they should either stay that way (cell 2,2, step 2) or change to a situation where their rule allows female leadership and they actually have a female leader (cell 2,1, step 2). If, in 2009, they allowed a female leader and had a female leader in practice, they should either stay that way (cell 1,1, step 2) or it might happen that, because

Table 3: Multivariate beta regression models on female leadership rules and practice.[8]

	Model 0		Model 1		Model 2	
	Rules 2022	Practice 2022	Rules 2022	Practice 2022	Rules 2022	Practice 2022
Intercept (posterior sd)			−1.12*(0.51)	−3.62*(0.80)	−1.09*(0.51)	−3.85*(0.69)
Rules 2009 (posterior sd)			4.15*(0.90)	2.61*(0.92)	4.07*(1.16)	0.51(3.86)
Practice 2009 (posterior sd)					1.28(1.04)	8.62*(3.58)
phi	0.56	0.42	3.55	3.92	3.42	7.62
elpd_loo (se)	38.4 (8.0)		52.3 (9.3)		54.4 (10.3)	
p_loo (se)	1.5 (0.3)		9.3 (4.9)		9.8 (5.3)	
looic (se)	−76.8 (15.9)		−104.7 (18.6)		−108.7 (20.7)	
bayes_r2	0	0	0.67	0.47	0.66	0.79
elp_diff			Model 1: 0 (0)		Model 2: 0 (0)	
(se_diff)			Model 2: −16.6 (5.8)		Model 1: −2.9 (2.6)	
N	13	13	13	13	13	13

Note: *The 95% credible interval lies outside 0. Figure A6 in the online supplement plots our actual data against model 2 predictions on both our dependent variables.

Table 4: Rule and practice of female religious leadership in 2009 and 2022.

		2022			
		1	2	3	4
	2009	Rule: liberal; practice: female	Rule: liberal; practice: male	Rule: conserv.; practice: female	Rule: conserv.; practice: male
1	Rule: liberal; practice: female	12 (step 2)	18 (step 2)	1	1
2	Rule: liberal; practice: male	41 (step 2)	97 (step 2)	0	7
3	Rule: conserv.; practice: female	0	2	0	0
4	Rule: conserv.; practice: male	2	22 (step 1)	2	69 (step 1)

Note: Counts are based only on congregations that have been surveyed both 2009 and 2022. Counts are not weighted. Cells "permitted" by the model are shaded gray.

of personnel turnover, they move to a situation with the rule still allowing female religious leadership, but the congregation being led by a man (cell 1,2, step 2).

Let us now turn to a simple statistical test. Let us assume that we would only be convinced of the existence of a sequence in the data if more than 90 percent of the cases fell into the cells allowed by the sequence. Therefore, we set up an exact test for a Bernoulli experiment to evaluate this, where the null hypothesis states that the true probability of success (i.e., a case falling into an allowed cell) is less than or equal to 90 percent ($p \leq 0.9$). The alternative hypothesis is that the true probability of success exceeds 90 percent ($p > 0.9$). With 259 successes out of 274 trials, the test yields a p-value of approximately 0.005. Additionally, the 95 percent confidence interval for the true success probability is [0.917, 1.000]. The small p-value provides strong evidence against the null hypothesis, supporting the conclusion that the true probability of success is significantly greater than 90 percent[9]. Overall, our analysis on the congregational level clearly speaks in favor of a rule–practice sequence (H2).

Simulating the Liberal Side Loose Coupling over Time

Our concept of a rule–practice sequence includes the idea that, once the official rules of the group allow the participation of a new type of actor (here: women), it takes time to fill the positions, which generates liberal side inconsistency. We have suggested that, in practical terms, if pastors in a large denomination hold their positions for a long time, it could take decades for the denomination to achieve equality between men and women in positions of power, even if a fully egalitarian access rule is introduced for all member congregations simultaneously.

To demonstrate this point, we now turn to a simple simulation. The simulation permits estimating the extent of liberal side loose coupling under different conditions.

The extent of liberal side loose inconsistency may depend on many factors. For our purposes, we will focus only on 2: (1) the velocity of liberalizing the rules and (2) the attrition rate, that is, the yearly probability for a congregation's main clergy to be replaced. We ignore other key factors, for example, the extent of liberalization of the

rules, the gender distribution of clergy candidates, and congregations' preference for candidate gender.

We start with 6,000 congregations from 100 different denominations. At the beginning, none of the denomination allows ordaining women and all clergy are male. For the simulations, the starting age of each initial clergy member is randomly sampled from the clergy age distribution in our 2009 wave. This distribution has a mean of 50.8, a median of 49.5, and a standard deviation of 11.3 years.

The rules of evolution are the following:

- After a set number of years, all denominations will have fully shifted their policy regarding women's eligibility to serve as main clergy. This change occurs incrementally and uniformly each year, meaning that if the timeframe is set to 2 years, half of the denominations will adopt equal rules in the first year, with the remaining half doing so in the second year.
- Each year, clergy is retired if the age of retirement age has arrived. The retirement age is set to be 70.
- Each clergy member also has a certain probability of being replaced for any other reason each year (attrition rate).
- If a clergy member has to be replaced, a new person is selected depending on the rules of the congregation. If the congregation has rule equality, the position has probability 0.5 to be filled with a woman. The age of the new recruit is drawn at random from the age distribution of the general population aged between 18 and 60 according to government data (SFO 2022). This distribution has a mean of 40.1, a median of 40, and a standard deviation of 12.1 years.
- The simulation runs for 100 years. Every year, each clergy member is aged by 1 year.
- The outcome of interest in the simulation is the extent of liberal side inconsistency over time.

In our simulations, we let only two parameters vary: the pace of the policy shift (0 or 50 years) and the attrition rate (10 percent or 2 percent). By combining the possible values of our parameters, we obtain 2×2 different configurations. It is clear that the most realistic policy shift pace is the second (50 years).[10]

In Figure 2, the red line represents the percentage of women in the clergy, whereas the green line represents the percentage expected in the case of a perfectly tight coupling (i.e., half of the congregations with rule equality are led by women). The gray area represents the extent of liberal side inconsistency (i.e., the difference between the percentage of women and the expected percentage).

The graph has four subplots. The rows distinguish the simulations according to the pace of the policy shift (immediate or more than 50 years). For example, the bottom right subplot, the duration of the policy shift is 50 years, and the attrition rate is 2 percent. This last scenario is probably the most realistic with regard to the Swiss case.

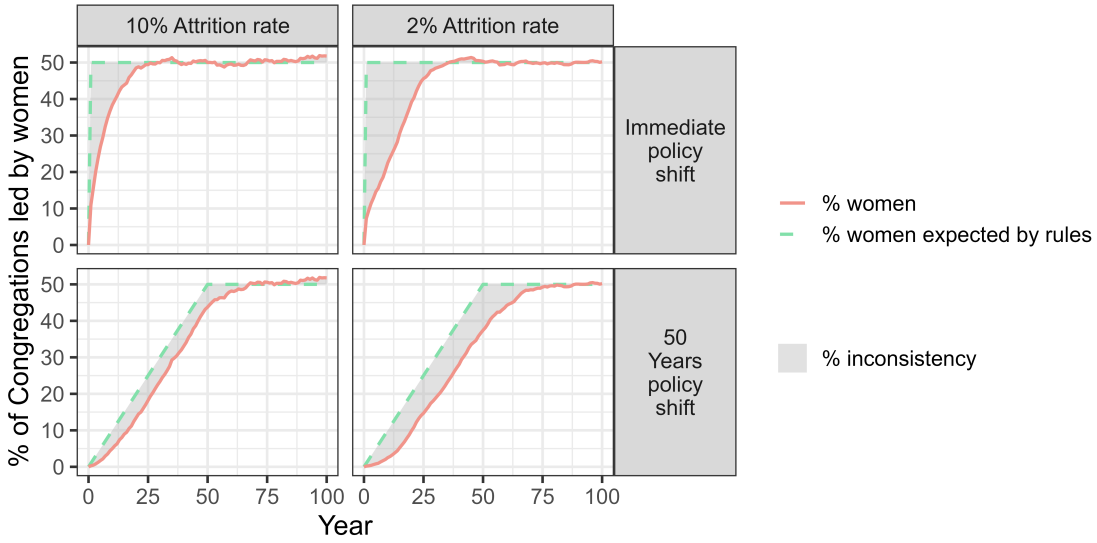

Figure 2: Extent of liberal side inconsistency over time in simulations under different assumptions.

We draw three observations from the graph.

First, all subplots show a non-negligible amount of liberal side loose coupling, even though our simulation is very optimistic about the probability (0.5) of a liberal congregation hiring a woman when it comes to renewing its clergy. When the policy shift is immediate, in the two upper subplots, the liberal side loose coupling is present in a decreasing manner for around 25 years. When the policy shift occurs gradually more than 50 years, liberal side loose coupling takes about 75 years to disappear.

Second, liberal side loose coupling is much larger when the attrition rate is more realistically parameterized (2 percent).

Third, in all scenarios, the time elapsed before parity is reached is considerable (between 25 and almost 100 years, depending on the parameterization).

What we can conclude from our simulations is that certain organizational factors, such as the attrition rate or the policy shift pace, greatly influence the way in which liberal side loose coupling appears and disappears. Thus, liberal side loose coupling, which is strongly present in our empirical data, is not only the result of a signaling strategy on the part of these congregations but also the fruit of characteristics specific to the religious sector, such as the low attrition rate[11]. The graph shows this for the attrition rate, but other demographic factors might also change the picture, for example, making the age of the initial clergy 10 years younger before running the simulations slows down the rate at which loose coupling disappears.[12]

Conclusion

We have set out to investigate how the rules and the practice of women's leadership in Swiss congregations have changed from 2009 to 2022 across all religious traditions.

Furthermore, we were interested whether there was a pattern in how inconsistency between access rules and practices emerged and disappeared.

Using an original data set, for the first time in a European country, we have investigated changes in rules and the practice of female religious leadership over time and across all religious traditions. Our results give clear answers to our research questions.

1. Both the access rules of religious congregations and the practice of female religious leadership within them have moved toward greater gender equality between 2009 and 2022 in Switzerland. There is considerable variation between different religious traditions and denominations, but the overall trends are mostly significant. Our first hypothesis (H1) can therefore be accepted.

2. There is a considerable extent of inconsistency ("loose coupling") between rules and practices of female religious leadership both in 2009 and 2022. Inconsistency "on the liberal side" is overwhelmingly more frequent than "on the conservative side." In other words, loose coupling typically manifests as congregations allowing female religious leadership in principle but not implementing it in practice.

3. Rule–practice inconsistency emerges and disappears mainly because of a two-step sequence: congregations first modify their rules to permit female leadership and only later implement this change in practice. This can be shown both on the aggregate level of denominations and the unit level of congregations. The sequence is both visually striking and statistically significant. This means that our second hypothesis (H2) can be accepted. The cases of rule–practice inconsistency "on the conservative side" are almost all Roman-Catholic congregations. Here, a rule forbidding female priesthood is combined with a severe shortage of (male) priests, leading to this type of inconsistency.

4. As simulations show, the rule–practice sequence of female religious leadership necessarily generates liberal side loose coupling, because even under the most favorable conditions, the filling up of positions with women is slowed down by the fact that most positions are occupied by tenured male incumbents. Religious field characteristics such as the low attrition rate may further increase the loose coupling on the liberal side.

Our findings are a contribution to three different but partly overlapping bodies of research.

First, we contribute to the literature on female religious leadership in general. Our results present a mechanism accounting for "loose coupling" over time: a sequence from rules to practice, followed by almost all congregations and denominations. Of course, the question remains of how generalizable these results are. Further research has to show whether the results hold when using more than two time points and when testing the theory on other European or non-European countries. A cursory comparison with the United States seems to show quite similar patterns. There, too, the access rules governing female leadership and the practice

of female leadership in congregations have evolved toward greater gender equality. These changes are very similar to those observed in the United States. For example, the proportion of congregations led by women rose from 12.3 percent to 14.7 percent in Switzerland between 2009 and 2022 and from 11 percent to 14 percent in the United States between 2011 and 2018 (Chaves and Eagle 2015, Chaves et al. 2021). From an exploration of the U.S. NCS, it seems the sequence might be found in the United States, but this will be the subject of another article.

Second, we contribute to the specific literature on religious leadership in European countries, as there is to date no study investigating changes in rules and practice of religious leadership in a European country across all religious traditions.

Third, our findings contribute to the sociology of social mechanisms literature (Boudon 1981; Manzo 2014; Raub, De Graaf, and Gerxhani 2022). This literature seeks to create simple models of social processes to draw out more general insights. In our situation, two key insights are that congregations change their rules and practices typically in sequence, and that such change will take significant time.

Of course, there are limits to our demonstration. (1) Our findings are limited to Switzerland, a small European country. (2) We only have two timepoints and it is not clear whether the sequence is robust to longer timeframes with more observations over time.

These limits notwithstanding, we believe that the finding of a sequential rise of female religious leadership is a noteworthy addition to our knowledge of the continuing rise of gender equality. We welcome studies trying to replicate and extend our findings.

Notes

1 NCSS 1 reports a total number of 5,734 congregations in 2009. The figure arrived at by NCSS 2 is 6,341. This marked difference (607 more congregations in second wave's count) is mostly explained by two retrospective changes made by NCSS 2 in calculating the number of congregations in 2008: We have counted all Catholic missions in 2008 that meet Chaves' definition as well as foreign language groups that meet the same conditions within Jehovah's Witnesses.

2 NCS1 data initially reported 1,040 participants. However, in the second wave, we identified 18 of these as not being congregations.

3 Web questionnaires were only introduced in the second wave. They concern 357 of the participating congregations, i.e., around a quarter of the 2022 sample.

4 Table A1 in the online supplement shows our sample sizes by survey year for each category of our 12-level religious tradition variable. In this variable, "Catholics" are exclusively Roman Catholics. Christ Catholics, a small established denomination, are coded as "Other Christians." Evangelicals are divided according to theological boundaries. Neo-Pietist denominations, most of which were founded in the nineteenth century, are referred to as "classical Evangelicals." Literalist/fundamentalist congregations are called "conservative Evangelicals," and charismatic and Pentecostal groups are called "charismatic Evangelicals." We have merged the Sikhs with the Hindus congregations for practical reasons, as there is only one Sikh congregation in the entire survey data set.

5 The "Women may be the main clergy person" item is the most discriminating of our rule items. It is almost sufficient to summarize the whole openness to female leadership

score: the average score in congregations that allow women to be the main clergy person is 4.95, compared to 2.93 in those that do not. The "Main clergy person is a woman" item relates to the highest position in a congregation and is far more indicative of real power than a seat on the board. Indeed, board positions are usually unpaid and often offer limited leadership opportunities (Stolz and Ballif 2010; Stolz and Monnot 2019).

6 The change observed in terms of access rules is sometimes spectacular. In the New Apostolic Church, for example, the proportion of congregations allowing women to be the main spiritual leader rose from 0% to 84% between our two waves, without affecting the proportion of congregations actually led by women (0% for both waves). This radical change is explained by the fact that the New Apostolic Church, a highly centralized denomination, adopted the possibility of women's ordination in 2022 as an official and compulsory policy (New Apostolic Church International 2022). Other denominations are far less centralized, and not all have an official policy on the question of women's ordination, which explains why many denominations, for one and/or the other wave, have intermediate values on the x-axis.

7 This model corresponds to the equation above.

8 We employ the brms default prior distributions for all beta regressions. Specifically, a uniform prior for the regression coefficients, a weakly informative gamma (0.01, 0.01) prior for the precision phi parameter, and a Student-t (3, 0, 2.5) prior for the intercept. These defaults are designed to be minimally informative, allowing the data to largely drive the results. We used two Monte Carlo Markov chains for each model fit. Each chain included 2,000 iterations, with 1,000 iterations dedicated to the warmup phase.

9 Even if we exclude the congregations that have not moved on either rule or practice (diagonal cells in Table 4), the probability of success remains very high (84.4%).

10 There are no nationally representative data on the attrition rate among Swiss clergy. For the United States, the most reliable studies report rates between 1% and 2% for American Protestant denominations (Hamm and Eagle 2021). Therefore, we consider 2% to be more realistic than 10% regarding the attrition rate in Switzerland.

11 It should be noted that the attrition rate appears to be much lower in the religious sector than in the economy as a whole. The national net turnover rate is estimated to be 10.4% in Switzerland in 2022 (SFO 2024).

12 Current research suggests that the rate at which parity is achieved in a given field can in certain cases be explained to a large extent by such demographic constraints (Alpert 1989, Hargens and Long 2002). For example, Hargens and Long (2002) consider that the age structures, the gender distribution of PhD pools and faculty positions, and the attrition rates are by far the most important factors explaining the slow pace of change toward gender equality in higher education institutions.

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