

How Women Shape Negativity in Parliamentary Speeches—A Sentiment Analysis of Debates in the Austrian Parliament

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Though negativity in political debates influences citizens' attitudes towards legislative institutions, research on how Members of Parliaments (MPs) use negative language remains scant. This study shows how the gender of speakers and the context of debates influence the level of negativity in parliamentary speeches. We argue that female MPs use less negative language than male colleagues due to gender differences in socialisation and stereotypical expectations. Applying sentiment analysis with word embeddings to 20 years of plenary speeches in the Austrian parliament, we find that speeches by women MPs are less negative on average compared to those of their male colleagues. A more balanced gender distribution within a party group decreases differences in tone by lowering the negativity of male speakers. A growing share of women in parliament can thus change the tone of debates, which might enhance the legitimacy of political institutions and the quality of democracy.

Keywords: Gender, Legislative Speech, Negativity, Parliament, Parties, Sentiment Analysis

1. Introduction

The behaviour of political elites and the way they communicate impacts public attitudes towards democratic institutions (e.g. [Mutz and Reeves, 2005](#)). A highly visible form of interaction between representatives of government and opposition is plenary debates in legislatures. Negative or uncivil plenary speeches can erode perceptions of fairness, undermine efficacy in opposition and government

relations and polarise voters who may ultimately turn away from democratic politics (Mutz and Reeves, 2005). Parliamentary debates consist of a sequence of Members of Parliament (MPs) taking their turn at the speaker's podium. As a result, giving a speech does not happen in isolation, speakers are not oblivious to what happens during speech-giving and they may refer to previous contributions or react to applause or heckling. The atmosphere in a debate can heat up quickly. For example, in the Austrian Nationalrat in 2012, the discussion of the Euro became increasingly disputed, with MPs using negative phrases referring to previous speeches by MPs from other parties as 'impertinence' or 'obscene', cumulating in a 'Call to Order' (Parlamentsdirektion, 2012). At other times, speeches on controversial topics remain fact oriented and the tone of the debate at a rather neutral level even when criticism of ministers' or other parties' policy proposals is involved. The wide range in debate tone—ranging from constructive criticism of other parties or the status quo to verbal incivility—is obvious to political observers and has different effects on perceptions of politics (e.g. Lipsitz and Geer, 2017; Haselmayer et al., 2020). Yet, thus far, we know little about how individual attributes of speakers and the setting affect the negativity in plenary speeches. To fill this gap, in this article, we answer the research question of how MPs' gender and contextual characteristics of parliamentary debates influence the level of negativity in plenary speeches.

Previous studies find a number of gendered differences in rhetorical interaction in parliament. Female MPs discuss policies in more precise ways (Bochel and Briggs, 2000), connect their arguments more often to personal experience (Childs, 2004) and tend to behave in a less adversarial manner than male MPs (see e.g. Hargrave and Langengen, 2020). To explain such gender differences in communication styles, research has drawn on the concept of gender stereotypes—stylised expectations about traditional roles of men and women in society. According to this idea, men are believed to exhibit traits such as strength, competitiveness, assertiveness, agency and aggression, whereas women are thought to be warm, sensitive and compromise oriented (e.g. Huddy and Terkildsen, 1993). Socialisation along these expectations systematically shapes behaviour and its perceived appropriateness (Eagly and Karau, 2002). Translating this rationale to communication styles in the legislative context, we argue that gender-stereotypical expectations about women's collaborative nature lead to a lower likelihood for female politicians to use negative language than for male ones. As a result, female MPs should use less negative language in speeches than their male colleagues. Furthermore, we postulate that the party context, the sequence of previous speakers and their gender influences this gap in the level of negativity in parliamentary speeches in two ways: First, speaking after female politicians should lower the level of negativity in the subsequent speech. Secondly, at the aggregate level, a

greater gender balance in parliamentary parties should reduce the negativity gap in rhetorical acts by male politicians.

Our analyses draw on 52,000 speeches from plenary debates in the Austrian National Council held by more than 500 different MPs over the course of two decades (1996–2013). This approach allows to directly measure gender differences in behaviour and adds to the existing research which relies on interviews with MPs to shed light on personal role understandings (with notable exception of [Hargrave and Langengen, 2020](#)). Austria provides an interesting case for studying negativity in parliamentary debates for two reasons. First, plenary debates are an important arena of competition between government and opposition parties. Secondly, in contrast to many other European countries, populist right-wing political parties such as the Freedom Party of Austria (FPÖ) have been in parliament for a long time. Previous research has repeatedly linked an increase of populist right rhetoric with political polarisation ([Bischof and Wagner, 2019](#)) and negative political communication ([Widmann, 2021](#)). Thus, Austrian plenary debates constitute an interesting case for studying the use of negative speech.

We rely on a graded conceptualisation of negative sentiment strength as different degrees of negativity have distinct effects on voter perceptions ([Lipsitz and Geer, 2017](#); [Haselmayer et al., 2020](#)). Our analyses demonstrate that female MPs' speeches are indeed less negative on average than those of male MPs. The effect is conditioned by the number of previous female speakers and the share of female MPs in the parliamentary party groups. A more balanced gender distribution in a parliamentary party group decreases differences in negativity because male MPs adapt their communication behaviour and become more positive as the presence of women increases.

The results have implications for the debate on the importance of women's presence in legislatures for the quality of democracy. They shed further light on how descriptive representation might enhance the evaluation of political institutions, trust and legitimacy, which are critical to democratic stability ([Gay, 2002](#)). Beyond bringing new perspectives to the floor, serving as role models and providing a feeling of inclusion (e.g. [Wängnerud, 2009](#)), female MPs and their speeches could contribute to a reduction of negativity in parliament, which can at least to some extent explain the level of public trust, efficacy and participation ([Mutz and Reeves, 2005](#)). The study further adds to the understanding of gender differences in negative political communication. Our results suggest that ambiguous evidence from previous analyses could relate to variation in the representation of men and women in parties. Research on gender differences in political communication, therefore, benefits from taking into account steady factors such as parties and party groups, but also flexible ones like the sequence of male and female speakers in parliamentary debates.

2. Gender and political negativity

A large body of literature investigates how women's presence in political arenas transforms political culture by articulating women's interests, perspectives and priorities. Employing a wide range of theoretical and empirical approaches, these studies predict that female and male MPs differ in their interests, legislative voting and in their policy priorities (Dahlerup, 1988; see e.g. Wängnerud, 2009 for an overview). In addition to the claim that men and women differ with regard to issue positions and substantive focus, political communication is another dimension in which male and female politicians are thought to take different approaches. Analysing electoral campaigns, a number of studies provide mixed evidence about differences in rhetoric: Some indicate that women use negative campaign strategies as often or even more frequently than their male counterparts (e.g. Walter, 2013), others find that female candidates use attacks less often than male candidates (e.g. Ennser-Jedenastik et al., 2017 for an overview). Beyond providing mixed results, most research focuses on political campaigns and studies measuring style in parliaments is limited and focuses on a small set of specific policy areas (Hargrave and Langengen, 2020) or certain types of debates (e.g. floor appointments in US state legislative committee hearings Kathlene, 1994). In particular, we know little about gendered communication patterns during parliamentary debates even though they constitute an important arena for confrontation between government and opposition and are thus crucial for legitimation (Jenny and Müller, 2021).

To fill this gap, we analyse the use of negative speech in parliamentary debates in order to shed light on whether women and men communicate differently in the same political settings. Negative speech can take various forms, including constructive criticism of opponents or the status quo to strongly negative or verbally uncivil forms of communication (Haselmayer, 2019; Jenny et al., 2021). Role congruency theory (Eagly and Karau, 2002) provides two explanations for why female MPs should be less negative than male MPs during debates in parliaments.

First of all, socialisation along the lines of gender stereotypes can account for gender-based differences in the use of negative language. Stylised expectations about men and women originate in belief systems, which ascribe men and women different roles in society based on their sex (see Huddy and Terkildsen, 1993 for an overview). Women are associated with a role as caretaker of the private, fulfilling obligations such as supervising children, taking care of the elderly and organising the household. In line with the abilities important to succeed in these tasks, women are expected to exhibit personal traits such as warmth, sensitivity, passion and orientation towards compromise in conflictual situations. Men, in contrast, are predicted to provide resources for the family and engage in the organisation of political life. As a result of these obligations in the public sphere, the logic of stereotyping foresees men to exhibit traits such as strength, competitiveness,

assertiveness, agency and aggression (see [Eagly and Karau, 2002](#)). Even though the societal role of men and women has changed overtime, this form of categorisation continues to inform beliefs about the qualities and behavioural patterns desired for each sex even today. Stereotypical expectations about women's communion (e.g. honesty, politeness and ability to handle people well) have even increased within the last years ([Eagly et al., 2020](#)).

Through socialisation, behavioural expectations are internalised and are thought to result in gendered patterns of communication. Consequently, men's style of speaking tends to be more agentic and assertive. Women communicate in more communal and passive ways employing affiliative or democratic language while acknowledging and agreeing with their conversational counterparts (e.g. [Banducci et al., 2012](#)). Previous research indicates that even in political contexts that typically call for agentic behaviour, socialisation along the lines of gender stereotypes shapes differences in the behaviour of men and women. In parliamentary debates, for instance, women behave less dominantly than men ([Koppensteiner et al., 2016](#)). Also, female politicians do less standing up and shouting and are less combative and aggressive ([Tolleson-Rinehart, 2001](#)) and tend to make fewer personal attacks (e.g. [Kathlene, 1994](#)). Likewise, in the UK, a study of five debates in the House of Commons provides evidence that male MPs interrupt more often ([Shaw, 2000](#)) and [Hargrave and Langengen \(2020\)](#) demonstrate that female MPs speaking about education, immigration and welfare employ adversarial language less often than their male colleagues.

Secondly, in addition to internalisation of a certain type of behaviour, for women it is more at stake once they use negative styles of communication. When men and women act in ways that are incompatible with gender stereotypical roles, women face prejudices about their competence according to the role incongruity hypothesis ([Eagly and Karau, 2002](#)). All behaviour that deviates from role prescriptions is perceived as inappropriate for women (e.g. [Rudman et al., 2012](#)). As a result, female MPs might fear to face disadvantages if their speeches are perceived as too negative as what is generally expected from women. Substantiating this line of argumentation, research indicates that women are penalised when they employ agentic rather than communal styles ([Carli, 2013](#)). Furthermore, nonverbal forms of communication that are assertive, forceful or domineering are depicted as inappropriate for women but acceptable for men. Women who express anger are viewed as less competent and more out of control than both angry men and women not showing emotion ([Brescoll and Uhlmann, 2008](#)). Also, studies provide evidence that women are punished more (e.g. through lower levels of likability) than men when they display clear expressions of dominance such as finger-pointing ([Williams and Tiedens, 2016](#)).

As a result, we expect female politicians in parliament to behave largely in congruence with gender stereotypes because of socialisation and as deviation from

this expectation is a risky strategy for them. As a consequence, female MPs should use less negative language than male MPs.

Hypothesis 1: In parliamentary debates, female MPs use less negative language than male MPs

As women tend to be calmer in their style of communication, we expect that they also influence the overall dynamics of the debate. Consequently, we argue that the likelihood to use forms of negative communication decreases with an increasing number of women immediately preceding a speech in a debate. This line of argumentation follows from the rationale, that if female speakers indeed use a less negative tone, unfair or disproportionate rhetoric can lead to a ‘boomerang’ or ‘backlash’ effect and harm its sponsor (e.g. [Fridkin and Kenney, 2011](#)). Both male and female MPs should thus be more reluctant to make use of negative speech if they immediately follow-up on a larger share of women MPs. On the one hand, in line with stereotypical predictions, men are expected to act politely towards women. Societal norms perceive men as disrespectful and rude when they are verbally or nonverbally aggressive against women ([Vogel et al., 2003](#)), and male politicians are expected to show a different behaviour towards female candidates ([Fox and Oxley, 2003](#)). Hence, some studies on campaigning show that there is a significantly lower likelihood for male candidates to attack a female opponent than to attack a male one (e.g. [Kahn and Kenney, 2004](#)). On the other hand, it seems risky for female MPs to react in a negative manner against a female colleague as it clashes with stereotypical expectations about appropriate behaviour ([Rojahn and Willemsen, 1994](#)). In a nutshell, we expect that female MPs positively influence the overall atmosphere of the debate and that subsequent speakers irrespective of their gender adapt their communication to this overall less negative tone during a discussion. In turn, the speech of both a male and a female MP should be less negative if the share of women among the preceding speakers increases. In contrast, the more speeches given by men within a debate, the more negative the subsequent speech. First evidence for this argument about the influence of the overall atmosphere provides a study on Germany which demonstrates that mixed-gender TV debates are more civil than all male discussions ([Maier and Renner, 2018](#)).

Hypothesis 2: The higher the share of female politicians preceding a speech, the less negative the speech of the subsequent MP

In addition, the contextual setting of parliamentary parties should shape the use of negative language in debates since the exposure to women in politics leads to a change in the behaviour of the majority. Critical mass theory suggests that a transformation of political culture can be triggered if women grow from a few

token individuals into a considerable minority of all legislators (Dahlerup, 1988). As their numbers rise, the theory predicts, women become increasingly effective in promoting changes in parliaments and politics that include social conventions such as a softening in tone, shorter speech-making, less formality and more precision in speeches (Dahlerup, 1988). Consequently, we expect that male MPs use less negative communication and adapt their behaviour in line with those of their female counterparts if women in politics are naturally a more common occurrence.

Previous research provides evidence for the argument that gender diversity affects the style of collaboration. Communication in small groups is enhanced by gender diversity (e.g. Bear and Woolley, 2011) and firm performance is improved by greater female representation on corporate boards (see Post and Byron, 2015 for an overview). Closer to our field of study is the finding of Ennsner-Jedenastik et al. (2017) who report that a larger share of women in the party group does not decrease the probability of using negative campaigning. Yet, the study focuses on election campaigns and includes a more diverse group of politicians, such as new candidates, which might dilute socialisation effects of parliamentary party groups. Based on these considerations, we hypothesise that politicians from party groups with a high share of women behave more alike and that the gender gap in negativity decreases.

Hypothesis 3: The more equal the gender distribution is in a parliamentary party group, the smaller is the gender gap in negative communication

3. Data and methods

To test these propositions, we study plenary debates in the National Council, the first chamber of the Austrian parliament, from five legislative terms (1996–2013). Austria has a parliamentary system where governments depend on majority support in the National Council. Plenary debates are public, frequently televised and Internet streaming service is provided by the parliamentary administration. In addition, media regularly report on these sessions, which makes them highly visible to the general public. Plenary debates are regulated with regard to total speaking time allotment for the parliamentary party groups, individual speakers and the speaking order. The latter is set by a combination of two criteria: alternation of speakers' party group affiliation, and of pro and contra speakers. Parliamentary party groups nominate speakers and their planned speaking time before the debate. Hence, MPs prepare their speeches to some extent but they spontaneously react to the previous speeches, feedback from the audience or heckling from other MPs (Jenny and Müller, 2021).

Plenary debates are structured along the government-opposition divide. During the period under investigation, two government coalition formats were

Table 1 Parliamentary speeches in the National Council by party and gender (1996–2013)

Party	Male	Female	0% Female	Total
SPÖ	9848	5002	33.7	14,850
ÖVP	9585	3451	26.5	13,036
FPÖ	8474	1702	16.7	10,176
Greens	4207	3982	48.6	8189
BZÖ	3376	613	15.4	3989
LiF	1041	415	28.5	1456
Team Stronach	220	70	24.1	290
Independent	141	5	3.4	146
Total	36,892	15,240	29.2	52,132

in office, first a SPÖ–ÖVP coalition (1996–1999), then a ÖVP–FPÖ/BZÖ coalition during two terms (2000–2006), followed by a renewed SPÖ–ÖVP coalition (2006–2013). Bound by a coalition treaty, government MPs uphold strict party discipline as do opposition MPs most of the time.

The dataset contains 52,132 speeches given by MPs from 7 parties (SPÖ, ÖVP, FPÖ, Greens, BZÖ, Liberals [LiF] and Team Stronach) and a small number of non-affiliated MPs, who left or were excluded from their party group. While ministers do the initial presentation of a government bill, they rarely participate in the subsequent debate and are technically no Members of Parliament, thus, we exclude speeches from cabinet members ($n = 3934$).¹ We also omit very short speeches with less than five sentences ($n = 515$) as these are particularly challenging for automated classifiers.

Table 1 provides a descriptive overview of the remaining speeches by party and gender. As the Standing Orders accord speaking time in proportion to party group size (Jenny and Müller, 2021), the number of speeches indicates the parties' relative size for the total period studied.

Women gave about 30% of the speeches. The gender distribution of the speeches varies in line with the respective party group's share of women (see [Supplementary Appendix A](#)) and its stance on gender equality. The Greens have an almost equal gender balance (48.6% female MPs), followed by the Social Democrats with one in three speeches given by female politicians. For the Christian Democratic People's Party (ÖVP), the LiF and the short-lived right-wing populist party Team Stronach, women contributed about one in four speeches. Among the right-wing populist parties, less than one in five speeches of the FPÖ and its splinter, the BZÖ were given by female speakers.

¹In the Appendix, we present analyses including cabinet members, which corroborate the results presented below.

4. Measuring negativity in plenary debates

Studies on negative political communication typically use a dichotomous conceptualisation of negativity. This approach cannot account for variation in how political actors talk more or less negatively (Haselmayer, 2019) even though a person speaking can determine whether and how strongly to criticise a policy or opponent. Moreover, a binary measure is unable to match public perceptions of negative political communication (Lipsitz and Geer, 2017), which may depend on the degree or sentiment strength of negative communication (Haselmayer et al., 2020; Haselmayer and Jenny, 2018). Therefore, this analysis builds on a graded understanding of negative communication. Our measure of negativity captures a broad variety of negativity ranging from weakly to strongly negative speeches, including incivility. Following previous research, we are only interested in the differences between non-negative (neutral and positive) to negative part of sentiment as psychological research highlights that negative information and evaluations contribute more strongly to human cognition, impression formation and decision making (e.g. Baumeister et al., 2001).

Our approach to computing negative parliamentary speeches relies on machine learning based on a crowd-coded training set (Rudkowsky et al., 2018; Jenny et al., 2021). The classifier uses these data and word embeddings from the *fastText*² library (Grave et al., 2018; Mikolov et al., 2018), which contains roughly two million items for the German language.³ Using subwords and the *Gensim* library⁴ allows calculating meaningful word vectors even for words that are not contained in the corpus. Each sentence is represented as a sequence of word vectors. This method preserves information on word order and captures short- and long-term dependencies between words. To deal with a sequential data input, we use a special recurrent neural network: The Gated Recurrent Unit processes the sequence of vectors and creates a single vector summary that is then passed on to a three-layered Multilayer Perceptron (MLP) performing the actual sentiment classification for each sentence as neutral, negative or very negative category.⁵ The

²<https://fasttext.cc/>.

³Subwords allow obtaining information for unknown compound words. As compounds are very common in the German language, and particularly relevant in the context of political speeches, this improves the coverage substantially.

⁴<https://radimrehurek.com/gensim/>

⁵The GRU units' dimension is 128 and uses a Rectified Linear Unit Activation function. The MLP transforms the output vector in three layers (with dimensions of 128, 128 and 64 using a Rectified Linear Unit Activation function). The final output layer (with a Softmax activation function) produces a single score per sentence from a three-valued negative sentiment scale.

MLP obtains sentence vectors by averaging its word vectors, which are then used to classify the strength of negative sentiment of a sentence.

During pre-processing of texts, stop words and punctuation were included. The procedure was trained with 20,580 sentences containing a continuous negativity score per sentence ranging from 0 ('neutral/positive') to 4 ('very negative'). These initial scores were split into three equal-sized classes ('neutral/positive', 'negative', 'very negative') to facilitate the prediction task and improve the classification accuracy of the algorithm. The model was trained 60 times with a dropout of 40% over the entire network. Thus, at each iteration, the model randomly drops out nodes during training. The main objective of this approach is to avoid overfitting and improve generalisation error (Srivastava et al., 2014). The average accuracy of this approach is 63%, which outperforms similar applications by 5 percentage points and bag-of-words approaches without word embeddings by 8 percentage points (Rudkowsky et al., 2018).

Whereas this attests to the validity of our approach to predict negative sentiment at the sentence level, we further test its validity at the level of plenary speeches. To do so, we aggregate sentence scores for each speech using the mean negativity score of all sentences (see below). An empirical validation shows the ability of this approach to detect negative speech in Austrian plenary debates. Examining the prediction of rule-based sanctions of (very) negative speeches (Calls to Order) in the Austrian National Council, Jenny et al. (2021) find that the mean negativity scores of these speeches correctly identified the sanctioned speeches in 75.3% of the cases. That prediction rate mirrors accuracy scores for similarly complex tasks in the German language, such as hate speech detection (e.g. Roß et al., 2016; Bai et al., 2018 report accuracy scores at about 75%, respectively). Finally, we validate crowd-coded negativity scores of a quota random sample of plenary speeches ($n = 48$).⁶ Comparing aggregated crowdscores (from a four-point incivility score) with automated scores yields a Pearson's correlation of 0.75 (Supplementary Appendix A3 provides additional information). Based on these validation tests, we are confident that our approach measures negativity in parliamentary debates adequately.

5. Operationalisation

Our dependent variable is the negativity score of a speech. It ranges from 0 (neutral or positive) to 2 (strongly negative) with a mean value of 0.50. The score reflects

⁶We use a quota sample to represent speeches across the empirical range of predicted negativity scores. Therefore, we draw speeches based on a quartile split of the negativity scores.

the mean negativity of all sentences contained in a speech. It is a ‘conservative’ measure of negativity, as longer speech segments with a neutral or only weakly negative tone dilute a single strongly worded statement in the overall sentiment score of a speech. Even though this approach reduces the range of variation of our dependent variable and thus the magnitude of effects, we consider it a trade-off to obtain valid results. Nevertheless, we are confident that the results reported below are substantively meaningful as they are robust to a number of additional tests (see [Supplementary Appendix B](#)).

We have three explanatory variables: the speaker’s gender (1 = female), the share of women in a parliamentary party group (PPG) in a legislative term (total mean of 0.31) and the share of female speakers among the previous five speakers (total mean of 0.30). We also include a series of control variables. Government party MPs are expected to be less negative than opposition party MPs, thus we control for party status. We further include an indicator variable for party group leaders. They are frequent speakers in debates deemed very important to the party and tend to be more negative than ordinary MPs ([Rudkowsky et al., 2018](#)). Other individual factors we account for are age (mean: 49.1) and academic degree (mean: 0.40). At the level of plenary sessions, we measure if a motion of no confidence was introduced in a debate (mean: 0.15) and account for Urgent Questions (mean: 0.08)—topical debates that are typically initiated by opposition parties in order to criticise the government. To control for a dynamic change in negativity, we include the tone of the previous speaker in our models (mean: 0.49). We also add a set of contextual controls. We account for the order of speaking in a plenary session (mean: 22.02) and include a measure of speech duration using the number of sentences (mean: 36.3) to control for a possible correlation with negativity (and a potential source of measurement error for the automated measurement of our dependent variable). Year-fixed effects account for a potential increase in negativity over time. The [Supplementary Appendix A](#) provides information on the distribution of these variables (Appendix A).

6. Results

The descriptives show that female politicians use less negative language in the parliamentary arena than men. Mean negativity scores of speeches by men are slightly more negative (mean = 0.51, standard deviation (s.d.) = 0.23) than speeches by women (mean = 0.47, s.d. = 0.23). Across parties, female MPs exhibit a more moderate tone compared to their male counterparts, as illustrated by [Figure 1](#). We expected party ideology or a parliamentary party’s gender balance to influence the size of the negativity gender gap. Yet, it is similar for left and libertarian parties—Greens, Liberals and Social Democrats (SPÖ)—and the two

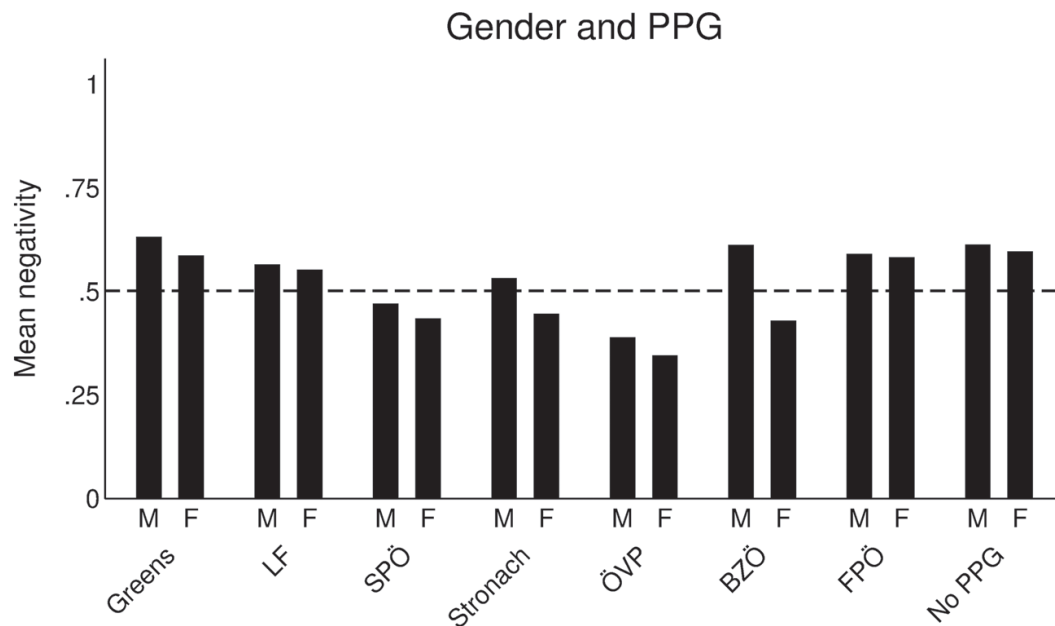


Figure 1 Negativity of plenary speeches by party and gender.

larger parties on the right,⁷ the (ÖVP and the FPÖ. Two party groups stand out with larger gender gaps in negativity: the FPÖ-splinter BZÖ and Team Stronach. Variation among male and female speakers is low for non-affiliated MPs (a group mostly composed of former members of FPÖ or BZÖ).

We argue that gender patterns in the sequence of speakers make a difference and that speeches following after a female speaker will be less negative than those preceding a male MP. Mean negativity scores across immediate follow-up speakers are indeed lower when the previous speech was given by a woman (mean: 0.48) compared to a man (0.51). This difference is regardless of the gender of the next MP stepping up to the speaker's desk (mean negativity of 0.48 versus 0.46 for women, 0.52 versus 0.49 for men). We also check whether the sequencing effect gets stronger the more female MPs participated in the debate before. [Figure 2](#) shows a weak 'dampening' effect for the share of women among the last five speakers: the mean negativity score decreases from 0.53 for speakers following after a male MP to 0.45 for speakers following after five female MPs.

Furthermore, we have presented an argument on gender balance and stereotypical rhetorical behaviour of MPs. We hypothesise that MPs from a PPG with a

⁷The share of women's representation in PPGs correlates strongly with party placement on the libertarian- authoritarian (GALTAN) dimensions based on data from the Chape Hill Expert Survey ([Bakker et al., 2020](#)). More libertarian parties have higher shares of women MPs ($r = -0.88$). The strength of the relationship makes it difficult to separate the effects of party ideology and gender composition. Yet, in line with prior research, we argue that the direction of the causal path should run from party ideology to share of female MPs in the party group (e.g. [Ennsner-Jedenastik et al., 2017](#)).

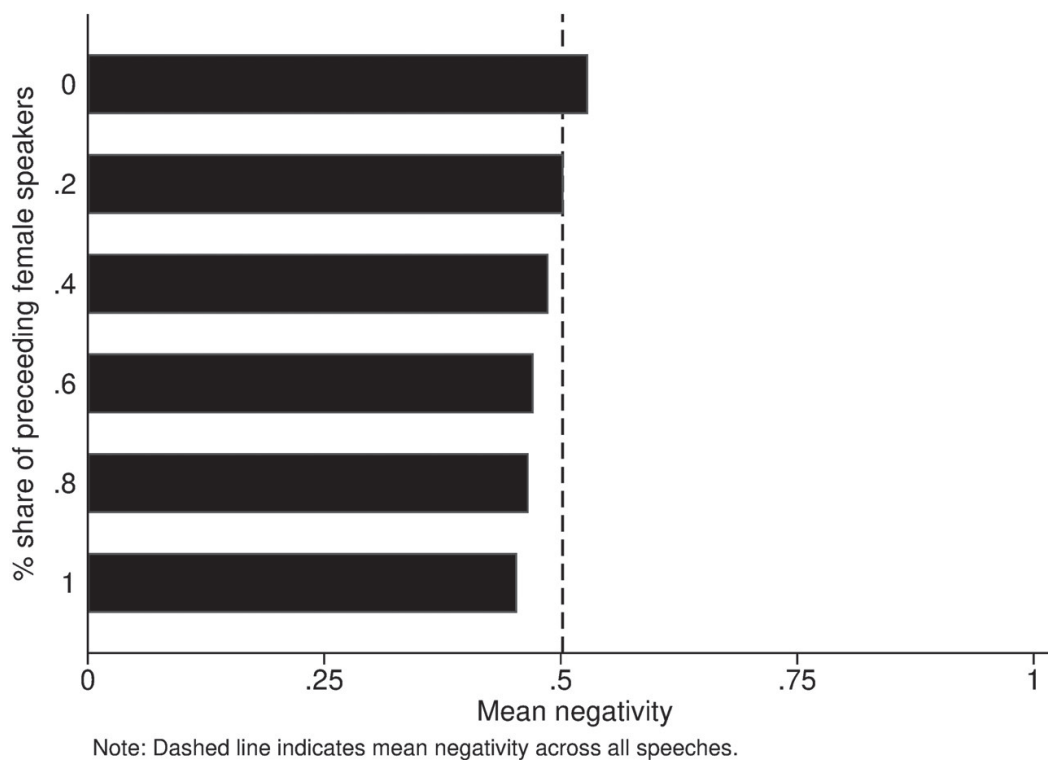


Figure 2 Negativity and share of female speakers among previous five speakers.

high share of women behave in less stereotypical ways than MPs in predominantly male party groups. Accordingly, the gender gap in negativity should decrease in PPGs with a more even gender balance. The variation in PPGs' gender distribution has a slightly positive correlation with the negativity of male ($r=0.21$) and female MPs' speeches ($r=0.27$).⁸ As the share of women in the PPG increases both, male and female MPs become more negative.

While univariate and bivariate statistics suggest confirming evidence for some propositions, more factors such as government composition, individual attributes of speakers or contextual effects are likely to interfere. For a more robust test of our hypotheses, we run multiple Ordinary least squares (OLS) regression models and control for government membership, political roles and individual attributes. We account for a potential increase in negativity over time by including yearly fixed effects. To capture dynamics within debates, the model controls for the sequence of speakers and the tone of the previous speech. Context factors, such as time and number of speakers also enter the models. Similarly, we include dummy variables for more controversial debates, such as Urgent Questions or Motions of no confidence. Finally, as longer speeches are more likely to contain negative information,

⁸The appendix presents a graphical representation of this relationship (cf. Appendix A).

we take the length of speeches into account. We provide descriptive statistics on the variables in [Supplementary Appendix A](#).

As most of the observed variation in speech negativity is at the level of individual MPs and plenary sessions, we use clustered standard errors at this level. Additional regression models with random intercepts at the level of party-session clusters, and regression models excluding parties that were only a single term in parliament corroborate the findings presented below. Additional checks based on repeated random draws of 1000 observations from the dataset are presented in [Supplementary Appendix B](#). This analysis shows that the results are not driven by the large number of observations.

[Table 2](#) presents the results of two OLS regression models testing our theoretical expectations. The second model adds an interaction term for female speakers and the share of female MPs in a parliamentary party group. With regard to our first expectation, the analyses confirm that female MPs are on average 0.03 less negative than male ones.

The second hypothesis predicts that MPs should tone down their speeches if they follow-up on (larger shares of) female speakers. Our analyses corroborate this expectation. The left panel of [Figure 3](#) plots the mean predicted values, which

Table 2 Ordinal least squares regression of negativity

Variables	Model 1		Model 2	
Female MP	0–0.03***	0.00	0–0.05***	0.01
Share of preceding female speakers, 0%	0–0.03***	0.00	0–0.03***	0.00
Percentage of female MPs in PPG	0–0.06***	0.01	0–0.09***	0.01
Female MP # percentage of female MPs in PPG			0.07***	0.02
Government party	0–0.18***	0.00	0–0.18***	0.00
PPG leader	0.09***	0.01	0.09***	0.01
Age	0–0.00***	0.00	0–0.00***	0.00
Academic degree	0.02***	0.00	0.02***	0.00
Tone of previous speech	0.18***	0.00	0.18***	0.00
Motion of no confidence	0.01***	0.00	0.01***	0.00
Urgent questions	0.07***	0.00	0.07***	0.00
Time	0–0.00***	0.00	0–0.00***	0.00
Number of speakers	0.00	0.00	0.00	0.00
Sequence of speakers	0.00***	0.00	0.00***	0.00
Speech length	0.00***	0.00	0.00***	0.00
Constant	0.45***	0.01	0.45***	0.01
Year fixed effects	Yes		Yes	
BIC	0–26,553.35		0–26,563.24	
N	49,433		49,433	
Adjusted R ²	0.35		0.35	

Note: Mean and standard errors are clustered at the level of MP-sessions ***p<0.001. Changes in the number of observations compared to [Table 1](#) are due to the lagged share of women MPs preceding a speech (n=2223) and the exclusion of speeches by non-affiliated MPs (n=146).

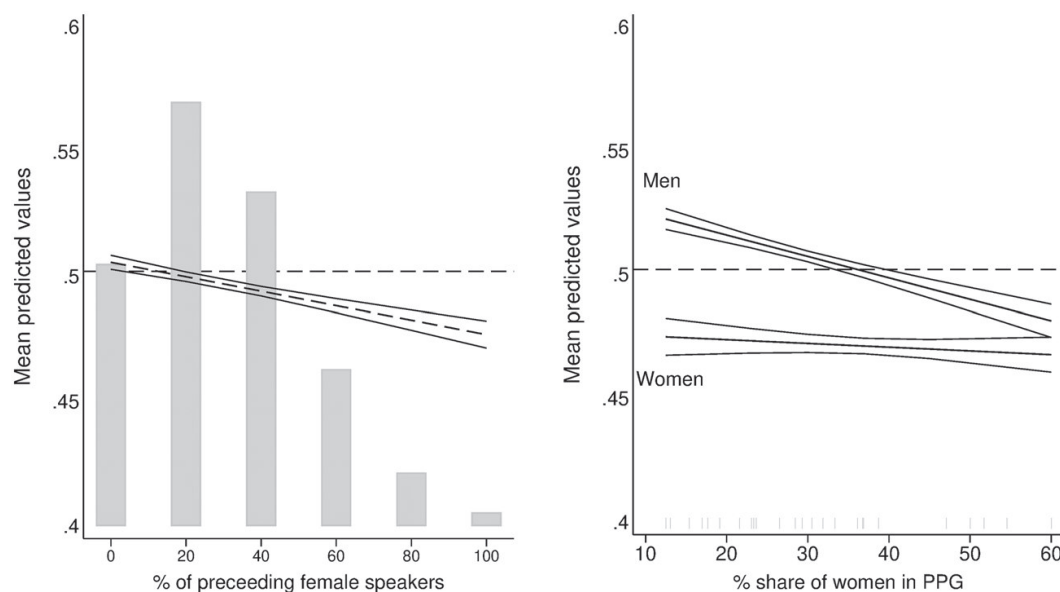


Figure 3 Mean predicted values.

indicates a linear, albeit small effect. Whereas the average negativity value is 0.51 in speeches immediately following after a male MP, this value goes down to 0.48 if all five previous speakers were women.

Our third hypothesis states that gender effects are contingent on the representation of women in parliamentary party groups. We argue that the rhetorical behaviour of men should come closer to their female colleagues in PPGs with an (almost) equal gender balance. To test this, we interact the gender of MPs with the gender balance of PPGs and provide a graphical presentation of the effect in the right panel of Figure 3. Results from Table 2 comfort our argument that gender differences in negativity should decrease when men and women are equally represented in their PPGs. The right panel of Figure 3 provides evidence for our theorised rationale. According to the predicted probabilities, speeches of male MPs are less negative as the gender balance of PPGs gets more even (0.52–0.48) while there is no difference in the rhetoric of female MPs (0.47). These findings support the expectation that the rhetorical behaviour of men and women converges in PPGs with an equal representation of male and female MPs. The reason for the observed convergence results from changes in the behaviour of men rather than women MPs. Again, the magnitude of these effects is very small, yet, it suggests that parliamentary speeches get (slightly) less negative in PPGs with a more even gender balance. On a general note, this suggests that women transform the political culture in parliaments as predicted by the critical mass theory (Dahlerup, 1988).

Turning to our control variables, we find that MPs from opposition parties are more negative than government MPs. Likewise, PPG leaders use a more negative tone than the average MP. At the individual level, younger MPs and graduated ones are more negative. We also find a negative effect for the share of female MPs

in a PPG, which corroborates the rationale outlined above, namely, that a greater share of female MPs reduces the overall negativity in a parliamentary party group. Finally, we also observe contextual effects: negativity tends to go up if the previous speaker was more negative, as sessions proceed and if plenary sessions are more controversial (interpellations and motions of no confidence). Moreover, longer speeches are more negative than shorter ones. The number of speakers has no effect on the sentiment of debates, yet, we find evidence that parliamentary debates get increasingly negative at a late hour.

7. Conclusions

This study sheds light on how the gender of speakers and gender balance in parliamentary parties influence the tone of plenary debates. Adding to previous findings of gender differences in political communication (Walter, 2013; Ennser-Jedenastik et al., 2017; Maier and Renner, 2018) our sentiment analysis of 52,000 plenary speeches by more than 500 MPs in the Austrian National Council reveals that speeches of female MPs are less negative than those of male MPs.

We also find a contextual effect: a more balanced gender distribution in PPGs decreases gender differences in negativity. This pattern supports the argument that when women enter the parliamentary arena, political culture transforms since male MPs alter their behaviour and thus the level of negativity converges. In contrast, female MPs tend to keep their own style even in a setting with predominantly male speakers and do not adapt to the more rhetorically aggressive style of male colleagues. Thus, a growing presence of women in parliaments seems to positively influence social conventions including the tone of parliamentary debates. Bringing in traits of women's culture leads to a change in communication in political parties and institutions and alters the 'way of doing politics' (Dahlerup, 1988).

Gender in the sequence of speakers also plays a role in setting the tone of parliamentary debates. Female and male MPs are less negative when preceded by one or more female speakers. Female MPs less often provoke strong negative reactions, which keep the course of a debate on a more civil path. Such a finding has wider implications as the behaviour of political elites impacts public perceptions of democratic institutions. High levels of negativity can increase political polarisation, erode trust in political institutions and decrease voter turnout (Mutz and Reeves, 2005). However, this study points at a countervailing factor. Active women in legislatures keep parliamentary debates more positive and, as a consequence, can promote citizens' confidence in political institutions. Overall, our findings enhance our understanding about how the descriptive representation of women might strengthen relations between citizens and governments, might improve trust in the workings of democracy and might reduce political polarisation.

Future research should move beyond single country case studies to provide insight into how system-level factors, such as strength of populist parties or variation in electoral systems affect the relationship between gender and tone of parliamentary debates. Comparative studies are needed to address whether our results—based on MPs elected in a multi-party system with proportional representation—transfer to a setting with MPs elected in single-member districts under plurality rule. Future research could explore the tone of debates across policy areas and whether female MPs, who speak with greater emotional intensity on ‘women’s issues’ tend to be more negative on these topics. Shedding light on these gendered dynamics will allow to understand whether the general political tone in plenary sessions as well as in parties affects citizens’ ambition to run for office and to become engaged in parties in general and women’s involvement in political processes in particular.

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Conflict of interest statement

The authors have no conflicts of interest to report.

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