

# The Gender Gap in Elite-Voter Responsiveness Online

Zachary P. Dickson

A number of important studies have documented gender gaps in the effectiveness or performance of individual representatives. Yet whether these differences are observable when it comes to responsiveness to public opinion is unclear. In this article, I examine the degree to which representatives use social media to dynamically respond to shifts in issue salience among the electorate. After combining nearly 400 bi-weekly repeated public opinion surveys from YouGov asking voters about their issue priorities, I trained a large language model to classify the universe of elected U.S. and UK representatives' social media messages on Twitter to the same issues. Findings reveal that women representatives demonstrate greater responsiveness than their male counterparts to shifts in issue salience according to both women and men constituents. Despite an overall bias toward male constituents, female representatives play a crucial role in narrowing the gender gap by consistently aligning their attention with the issues prioritized by female constituents. These findings not only contribute to our understanding of elite-voter responsiveness but also underscore the substantive benefits that women representatives provide for *all* constituents.

The extent to which descriptive representation—representation by members who share a common background or physical characteristics with the represented—leads to greater substantive representation—representation whereby members act in the interest of the represented—is the subject of decades of thoughtful scholarly literature on women's representation (Pitkin 1967; Mansbridge 1999; Phillips 1998; Campbell, Childs, and Lovenduski 2010; Celis and Childs 2012; Reingold 2008; Barnes 2016; Anzia and Berry 2011; Bratton and Ray 2002; Dovi 2007; Clayton et al. 2019; Wängnerud 2009; Kitilson 2008; Thomas 1991; Lowande, Ritchie, and Lauterbach 2019; Carroll 2003; Chattopadhyay and Duffo 2004; Beckwith 2014; Weeks 2022). Yet empirical findings on the link between descriptive and substantive representation are mixed, with some studies finding that the share of women in power leads to better outcomes for women constituents (Ferland 2020; Clayton et al. 2019), while others find that the share of women officeholders has little or no effect (Homola 2019; Dingler, Kroeber, and Fortin-Rittberger 2019; Reher 2018).

Several recent studies, however, take a different angle and instead suggest that when women representatives are

able to act in an individual capacity, they go further than their male peers to advance the substantive interests of *all* constituents. These studies point to greater barriers to entry into politics and sex-based discrimination in the electoral process, both of which effectively create a scenario in which women in power, conditional on winning elected office, tend to be of higher quality than their male peers (Homola 2019; Dingler, Kroeber, and Fortin-Rittberger 2019; Reher 2018). Support for this argument comes from a number of studies focusing on the U.S. context. For instance, congresswomen are shown to be more responsive to constituency service requests (Thomsen and Sanders 2020), to be more collaborative (Barnes 2016; Volden, Wiseman, and Wittmer 2013), to give more speeches on the House Floor (Pearson and Dancey 2011), and to deliver greater funding for their electoral districts (Anzia and Berry 2011).

Although this literature convincingly demonstrates that women representatives “out-perform” their male colleagues on a number of legislative tasks, the extent to which public opinion drives these gendered differences remains unclear. In this article, I study the relationship between dynamic public salience and the attention of representatives in the primary legislative bodies of the United States and UK—the U.S. House of Representatives and the UK House of Commons. Methodologically, I combine nearly 400 repeated bi-weekly public opinion surveys from YouGov asking voters about their issue priorities in the United States and United Kingdom. I use these high-quality,

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representative surveys to capture the dynamic salience of different issues according to different segments of the electorate, effectively creating dynamic issue agendas for women and men constituents in each country. I then create similar issue agendas for representatives by focusing on the content of their messages sent on the social media platform Twitter (now X). After combining over three million messages sent between 2018 and 2022, I trained and validated a large language model for classification of each of the messages according to the issues domains for which public opinion data were available.

Results from vector autoregressions and fixed effects specifications suggest that in both countries, women constituents receive less attention from representatives than men constituents. However, women representatives narrow this gender gap by consistently demonstrating greater responsiveness than men representatives to shifts in salience from women constituents. Importantly, I find that greater responsiveness from women representatives does not come at the expense of responsiveness to men constituents. In fact, the results illustrate that women constituents similarly outperform their male counterparts in responsiveness to men constituents as well. These findings are consistent across both countries and are robust to a number of modelling specifications, including several alternative explanations and robustness checks.

The findings of the article therefore contribute to the literature on elite-voter responsiveness and gendered patterns in representatives' behavior in several important ways. First, a focus on the substance of representatives' communication on social media offers a new perspective on the substantive representation of voters (Pitkin 1967). Although representatives' communication on social media may not necessarily translate to legislative action, research shows that voters want their representatives to address policy issues on social media (Giger et al. 2021), and may even associate satisfaction with democracy with the degree to which representatives verbally emphasize the issues that are important to them (Reher 2016).

The findings moreover constitute an important contribution to the literature on gendered patterns in representatives' behavior by providing insight into the individual responsiveness of representatives to constituents. Given that political institutions and party discipline constrain the degree to which representatives can act in an individual capacity (Kam 2009; Clayton and Zetterberg 2021), representatives may indeed wish to signal to the electorate that they are aware of and responsive to the issues that are most important to them, but may be unable to do so in traditional legislative settings. Social media provides representatives with an opportunity to act in an individual capacity, and to distinguish themselves from the programmatic party agenda while speaking directly to constituents (Russell 2021b).

Finally, the study is important for understanding the ways in which representatives respond to constituents in

real time. Although a number of studies have examined congruence between parties or representatives and the preferences of the electorate, politics is a dynamic process and public attitudes are constantly in flux. By focusing on high-frequency repeated surveys and millions of messages sent by representatives on social media, the study is able to capture responsiveness as a dynamic process, differentiating between mandate fulfillment and the degree to which representatives actively adapt to changes in the electorate's opinions.

The remainder of the article proceeds as follows. In the next section, I outline the mechanisms underlying the "out-performance" argument before highlighting expectations for dynamic responsiveness. The following section provides the research design and details the data collection and analysis process. Next I provided the results, which are followed by robustness checks and a discussion.

## Gender and the "Out-Performance" Argument

A number of studies that highlight gender differences in legislative behavior show that women outperform their male peers in a number of political and legislative domains (Lazarus and Steigerwalt 2018; Barnes 2016; Holman 2014; Thomsen and Sanders 2020). Among the first to demonstrate this, Anzia and Berry (2011) showed that U.S. congresswomen were more effective than congressmen at securing funds for their respective districts. The authors reconcile two strands of research on sex-based discrimination, arguing that at least two forms of "sex-based selection" result in higher quality women candidates in relation to men. First, compared to male candidates, women tend to be more concerned about their political viability and credentials. For example, Lawless and Fox (2005) demonstrated that women consistently underestimate their qualifications for office, even when such qualifications are matched with men candidates who believe that they are qualified. Moreover, women candidates may have a higher aversion to political competition (Preece and Stoddard 2015), or be more likely to believe that they have more to lose from an unsuccessful bid at elected office than men (Lawless and Fox 2005). These beliefs prove to be valid as well. Women candidates often face greater electoral competition (Lawless and Pearson 2008), face greater challenges raising campaign funds (Jenkins 2007), and receive less support from party organizations (Sanbonmatsu 2010). Therefore, the decision to run for elected office is gendered, with women likely to associate higher costs with running for political office than men.

The second explanation for the out-performance of women candidates focuses on the role of sex-based selection in elections. A number of studies highlight the role of gendered stereotypes and gender bias in the electoral process (Bauer 2015; Sanbonmatsu 2002; Boussalis et al. 2021; Lovenduski 2005; Ashworth, Berry, and

Bueno de Mesquita 2024; Cassese and Holman 2018). This bias is often attributed to the fact that voters tend to privilege male over female characteristics (Bauer 2015; Sanbonmatsu 2002; Boussalis et al. 2021). Consequently, to the extent that women candidates are more likely to embody characteristics typically associated with women—or be subjected to stereotypes that marginalize traditionally feminine characteristics<sup>1</sup>—voters may disproportionately discount women candidates at the ballot box.

A third explanation for the out-performance of women in elected office that has been advanced in the context of legislative performance specifically points to institutional constraints that privilege masculinity. Even once elected, women face disproportionate barriers in the legislature that requires them to work harder to achieve the same level of success as their male colleagues. Masculinity is both embedded and hegemonic in political institutions, which often deem traditionally feminine behaviors to being emotional, irrational and weak (Lister 1997; Lovenduski 2005). Therefore, for women to be successful in legislatures, they must compensate for a lack of power and opportunity (Barnes 2016; Lazarus and Steigerwalt 2018; Bauer 2020).

### ***What about Responsiveness to Public Opinion?***

Each of these three aforementioned explanations act in combination to create a scenario in which “only the most talented, hardest working female candidates will succeed in the electoral process” (Anzia and Berry 2011, 478). Yet while many important studies find support for the out-performance argument by demonstrating that women representatives are proactive in their legislative behavior (Höhmman 2020; Kweon and Ryan 2022), the wider literature on representation has also highlighted the importance of the reactive behaviors of representatives, and the extent to which representatives are responsive to the preferences of their constituents (Stimson, MacKuen, and Erikson 1995; Erikson, MacKuen, Stimson, et al. 2002; Burstein 2003; Soroka and Wlezien 2010; Pitkin 1967; Powell Jr. 2000). Although responsiveness is only one element of substantive representation, it is nonetheless an important condition and features prominently in Pitkin’s definition of substantive representation. Moreover, voters value responsiveness from their representatives (Carey 2008), and voters’ satisfaction with democracy has been shown to be a function of the degree to which representatives respond to their issue concerns (Reher 2016)

Several studies examine responsiveness or policy congruence in the context of representatives’ gender. For example, Griffin, Newman, and Wolbrecht (2012) examine dyadic policy representation in the U.S. Congress and find that having a women representative does not improve congruence. In contrast, Höhmman (2020) shows that women representatives in the German Bundestag demonstrate greater responsiveness on women’s issues by raising

more parliamentary questions. Clayton et al. (2019) find that women representatives prioritize similar issues as women constituents, enhancing congruence, but that the relationship is also a function of the strength of democratic institutions. Differing slightly, Thomsen and Sanders (2020) use an audit study to examine gender differences in responsiveness to constituent requests. The authors find that women representatives are indeed more responsive than men, but that the gender of the constituent who makes the request does not enhance the relationship.

Several studies within the descriptive representation literature also examine the degree to which an increase in the number of women in parliament leads to a more responsive government. Among these studies, several find that an increase in the proportion of women in parliament leads to a more responsive or congruent government (Ferland 2020; Forman-Rabinovici and Sommer 2019), while others find little or no effect (Reher 2018; Homola 2019; Dingler, Kroeber, and Fortin-Rittberger 2019).

Although this literature is somewhat mixed when it comes to the relationship between gender and responsiveness to public opinion, the literature making the “out-performance” argument suggests that when representatives are able to act in an individual capacity, they go further to advance the substantive interests of constituents. I therefore expect that in contexts in which representatives have the capacity to respond to public opinion individually, women representatives will make a greater effort to do so in relation to men representatives. Specifically, I expect that women representatives will be more active in using the platforms available to them to signal to constituents that they are aware of and responsive to salient public issues. Moreover, I expect responsiveness to be dynamic, and that changes in public salience will be more predictive of later changes in the attention of women representatives compared to men. This expectation is formalized in the following hypothesis:

**Hypothesis:** Women representatives are more responsive than their male colleagues to changes in public opinion.

### **Dynamic Responsiveness**

To test the hypothesis, I examine correspondence between the salience of different issues according to the public and the amount of attention those issues receive from representatives. Specifically, I focus on the extent to which the level of importance women and men attribute to different issues predicts the level of attention women and men representatives devote to the same issues. This conceptualization of responsiveness is also referred to as dynamic agenda responsiveness or issue responsiveness in the representation literature (Traber et al. 2022; Klüver and Spoon 2016).

To understand dynamic responsiveness to public issue salience, measurement of both issue salience and representatives' attention are required. To capture issue salience, I rely on repeated surveys asking respondents to identify the most important issue facing the country. Although such surveys are not without their limitations (Wlezien 2005; Dennison 2019), they are widely used to measure issue salience in the literature on public opinion and political behavior (Soroka and Wlezien 2010; Klüver and Spoon 2016; Yildirim 2022; Traber et al. 2022; Reher 2018). Moreover, when combined over time, they capture changes in public salience according to women and men constituents, which makes them well-suited to the task of creating dynamic agendas for different segments of the electorate.

To capture the attention of representatives, I relied on data from Twitter (Twitter 2021).<sup>2</sup> There are several advantages of using the social media messages of representatives to understand their attention. First, politicians' tweets are often concise declarations of interests and focus. Due to the character limits on tweets, representatives (and all users) are required to convey clear statements that leave little room for ambiguity. Second, tweets—and social media more broadly—give representatives the opportunity to signal their preferences outside of the institutional constraints of parliament (Sältzer 2020; Peeters, Van Aelst, and Praet 2021). Moreover, past research has shown that voters prefer their representatives to address policy issues on Twitter (Giger et al. 2021) and that MPs in turn use Twitter to build policy reputations with constituents (Russell 2021a). A third advantage of using communication data from Twitter is that it allows for capturing the dynamic attention of legislators over time to the same issues that are prioritized by voters. Whereas legislative bills or roll-call votes occur sporadically and may be planned long before a shift in the electorate's attention, representatives can use social media to signal to the electorate that they are aware of and responding to the issues that are most important to them in real time.

By relying on messages sent directly from the personal accounts of representatives, an assumption that is made is that the messages are sent from the representatives themselves or by authorized staff on behalf of the representative. Although representatives may delegate their social media accounts to staff, I assume that the substantive content of the messages is nonetheless a direct reflection of representatives' wishes. This is a common assumption made in studies that use social media or other forms of communication such as newsletters to understand representation (Sältzer 2020; Peeters, Van Aelst, and Praet 2021; Blum, Cormack, and Shoub 2023).

### *Measuring Public Issue Salience*

Measuring public issue salience required collecting and combining every nationally-representative YouGov survey

fielded in the United States and UK that asked voters what they believed to be the most important issue facing the country (YouGov 2021a, 2021b). Between 2018 and 2022, YouGov fielded 204 surveys in the United States and 182 surveys in the UK. Sample size in the U.S. surveys included a minimum of 627 and a maximum of 4,082 adults, and the UK surveys included a minimum of 971 and a maximum of 5,226 adults. All surveys are publicly available and were downloaded directly from the YouGov website.<sup>3</sup>

The surveys vary slightly in the frequency with which they were conducted, but most are conducted every 1–2 weeks with subtle exceptions around holidays. One limitation of the surveys, however, is that respondents may select only one issue in the United States, while UK respondents can select up to three issues. I address this limitation by analyzing the two countries separately. There are also subtle differences in the set of issues from which respondents may select. For example, the UK surveys allow for the selection of the “The UK leaving the EU,” which was one of the most salient issues in the country. However, Brexit (e.g., “The UK leaving the EU”) was not as key of an issue in the United States, and was not an option in the U.S. surveys. Therefore, “The UK leaving the EU” was only included in the UK analysis. Additionally, only issues that could be harmonized over the entire analysis were included, which amounted to eight issues in the United States and nine issues in the UK. These issues included health, crime, tax, education, immigration, economy, environment, defense, and Brexit (UK only).

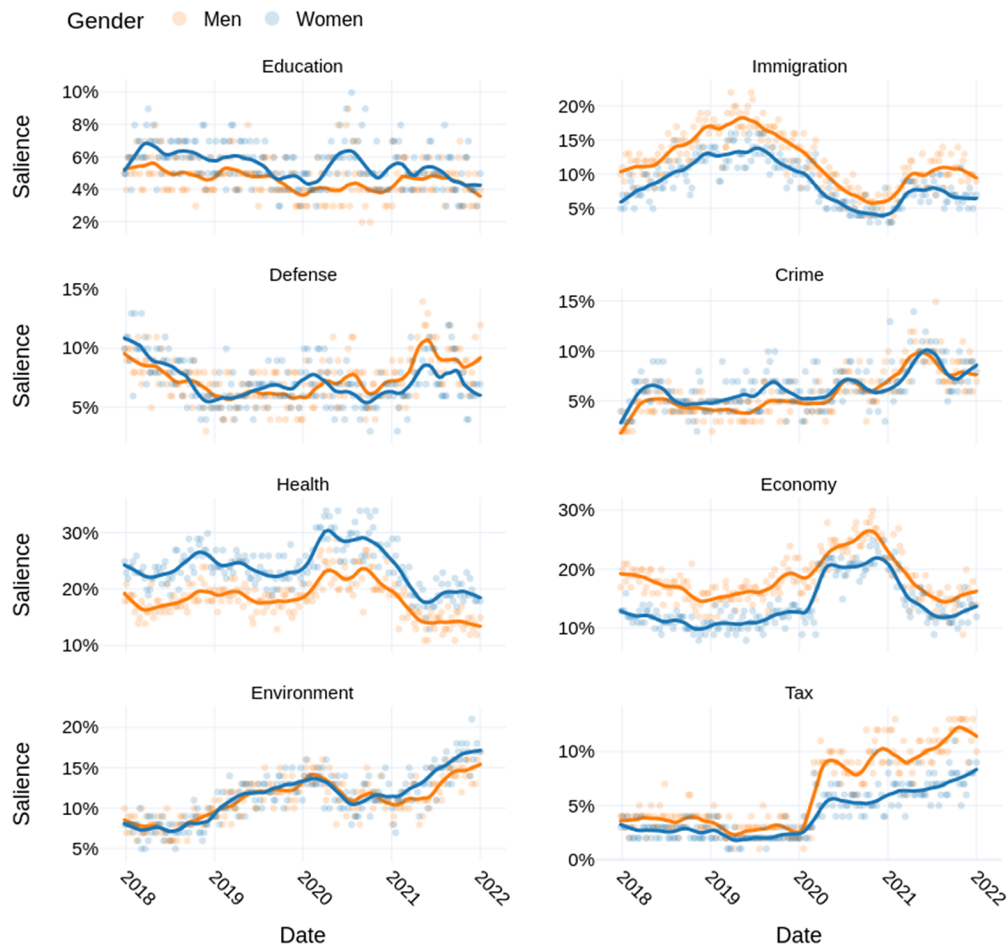
Following similar studies of dynamic responsiveness (Traber et al. 2022; Klüver and Spoon 2016), measurement of the public's issue salience for different issue priorities is based on the percentage of respondents who select each of the issues to be the most important issue, excluding respondents who replied with “don't know”. For example, if 15% of respondents selected immigration as the most important issue, then the level of salience for that issue would be 0.15. The aim of measuring public salience in this way is to capture changes over time rather than the absolute salience of an issue at a given time. This measurement is used for each of the issues in the surveys, and for both of the countries in the analysis according to gender of the respondent.

Figure 1 and Figure 2 present public issue salience resulting from combining the surveys conducted in the United States and UK from 2018–2022. In the figures, each point represents a separate survey and the y-axis is the percentage of voters who selected each issue to be the most important issue in the survey according to the gender of the respondent.

The figures demonstrate considerable variation in the salience of different issues over time, with strong correlations between women and men on many of the issues. The influence of COVID-19 on the salience of health and the



**Figure 1**  
**Dynamic public issue salience in the U.S., 2018–2022**



*Note:* Floating y-axis. The y-axis is the percentage of the population identifying an issue as one of the most important issues facing the country. Respondents may choose only one issue. Data rely on combined YouGov public opinion surveys conducted in the United States from representative populations of men and women. Each point represents a separate survey and the trend line is the 12-survey moving average.

economy is clearly visible in both countries, with men tending to prioritize the economy compared to women, and women tending to prioritize health compared to men. Education and taxes also appear to be gendered in both countries, with women prioritizing education and men prioritizing taxes. In the UK, Brexit was one of the most salient issues throughout the time period, but would drop in salience dramatically following the UK's exit from the EU in 2020.

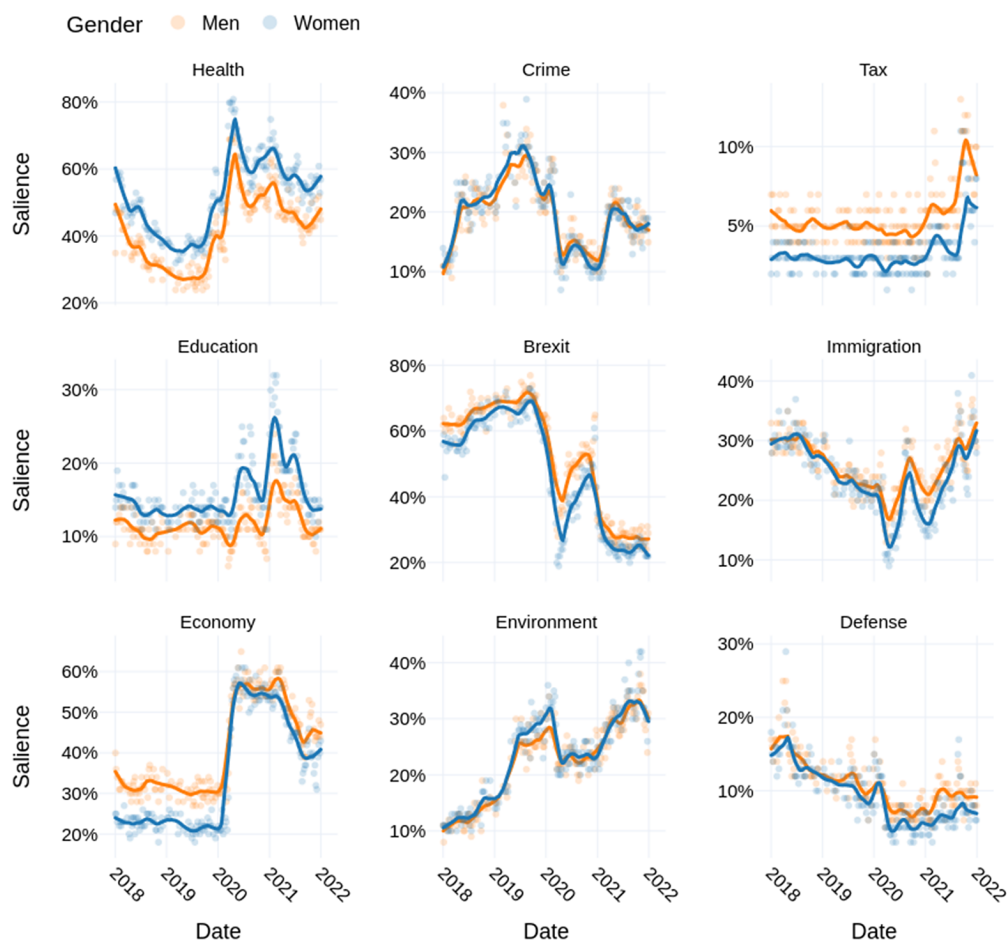
#### *Measuring Representatives' Issue Attention*

To measure representatives' attention to the different issues presented in Figure 1 and Figure 2, I collected every publicly available tweet sent by elected legislators in the U.S. House of Representatives and MPs in the UK House of Commons between 2018–2022. Tweets sent from

representatives were collected through the Twitter Academic Research Track API (Twitter 2021). Although no longer in use, the API had been made specifically for academic researchers and afforded expanded access to Twitter data for research purposes. After dropping all messages that did not contain text from the user (i.e., retweets without new quotes), there were 3,165,899 messages across both countries. In total, 1,032,650 were sent by women representatives and 2,133,249 were sent by men. This differential roughly reflects the two-to-one makeup of men and women in the two legislative bodies. I present descriptive statistics the the data in online appendix C.

After collecting the Twitter messages, a method for determining the issue of each message was required. For this task, I fine-tuned a pre-trained large language model to predict the issue of each message.<sup>4</sup> As tweets are relatively

**Figure 2**  
Dynamic public issue salience in the UK, 2018–2022



Note: Floating y-axis. The y-axis is the percentage of the population identifying an issue as one of the most important issues facing the country. Respondents may choose up to three issues. Data rely on combined YouGov public opinion surveys conducted in the UK from representative populations of men and women. Each point represents a separate survey.

short and concise, I used a pre-trained BERT model (Bidirectional Encoder Representations from Transformers) as the base model. BERT is a large language model that was pre-trained on a large corpus of English text, including a corpus of English Wikipedia and thousands of textbooks (Devlin et al. 2018). An additional layer can then be fine-tuned in order to perform specific tasks. For the task at hand, the pre-trained model was fine-tuned to classify representatives' messages according to the issue they addressed. To fine tune the model, I used an annotated training data set of 7,000 tweets from the wider set of representatives' messages. After fine-tuning, the model achieved a weighted average F1 score of 0.77 on a held-out test set that had not been seen by the model. Further details about the training and validation procedures are provided in online appendix D.

After classifying each message, I created a measure of representatives' attention by using the proportion of

messages sent by each representative about each issue.<sup>5</sup> This measure of attention follows the logic that representatives face real-world trade-offs in allocating their attention to different issues, and are therefore required to strategically attend to certain issues with an opportunity cost associated with ignoring others (Jones and Baumgartner 2005). Moreover, measuring attention as a proportion accounts for the fact that representatives do not participate equally on Twitter. The same measure of attention was used for each of the issues in the analysis, and for both of the countries in the analysis.

### What Does "Attention" Look Like?

During the time the data were collected, Twitter messages were limited to 280 characters, which is roughly equivalent to 50 words. As such, Twitter messages are not long enough to address a complex policy issue in detail. Instead, Twitter messages are often used to signal support or

opposition to a policy or to highlight a specific aspect of an issue. These expressions constitute a representatives' attention to different issues. For example, the following is a tweet sent from Barry Gardiner, a UK Labour Party MP, in early 2021:

If you really wanted safe and legal routes for refugees why did you close the Dubs Scheme, stop family reunion from Europe and restrict the Syrian Resettlement scheme? These plans create a limbo without hope for people fleeing violence and war.

The message references the UK government's vote against the Dubs Amendment, which would have allowed unaccompanied child refugees in the UK to reunite with their families. While the message may not be long enough to address the issue in detail, it signals the representative's attention to immigration and was classified as such by the trained model.

Across the Atlantic in the United States, representatives were similarly focusing on immigration policy on Twitter in early 2021. The following is a tweet sent from Republican Representative Steve Scalise in March 2021. With the message, Scalise shared a video of a Democratic official from Texas speaking about the situation at the U.S.-Mexico border.

Attention Joe Biden:

A Texas DEMOCRAT who represents border towns is calling out your policies:

"The way that we're doing it right now is catastrophic and is a recipe for disaster."

"It won't be long before we have tens of thousands of people showing up to our border."

In the message, Scalise highlights the potential threat anticipated by a local official created by President Biden's immigration policies. This message addresses the issue of immigration and was classified by the model accordingly.

The messages are examples of how representatives use Twitter to signal their attention to a particular issue. However, both messages expressed opposition to existing policy. At the same time, representatives also use Twitter to signal support. For example, the following is a tweet sent from Democrat Representative Mary Scanlon in late 2021:

We can't count on SCOTUS to protect our reproductive freedom. The Senate must pass the Women's Health Protection Act now.

The congresswoman displays her support for a women's health bill in calling for the Senate to support the bill. The message was classified as addressing the issue of health.

Representatives also show their attention to issues by highlighting constituency service or by advertising their own work on an issue. For example, the following is a tweet sent from Labour MP Marie Rimmer in mid-2019.

I was glad to be able to meet with some of my constituents today to discuss the threat of the #ClimateEmergency and what actions I could take as an MP to help fight it. I constantly receive correspondence on this issue from constituents and I'm glad to support them #TheTimeIsNow

With the message, Rimmer shared an image of herself with several constituents at what appears to be a local climate protest. The message was classified by the model as addressing the issue of the environment.

Although each of these example messages are different in their content, they all signal a representative's attention to a particular issue. Individually, there are limits to what can be learned from a single message. However, representatives send thousands of messages that similarly signal their attention to different issues. When combined over time, these messages can provide a temporal picture of a representative's attention to the issues that matter to constituents.

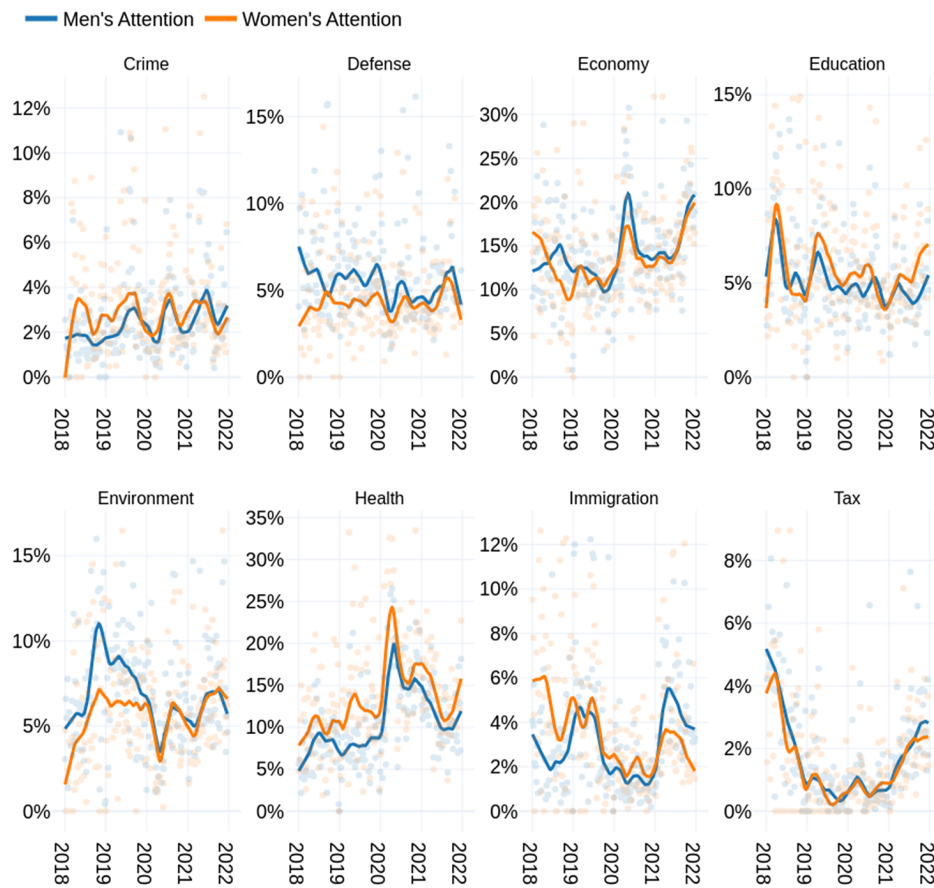
Figure 3 and Figure 4 present the levels of attention that male and female representatives give to each of the eight different issues. As mentioned previously, attention is the proportion of messages about a given issue at a given time period. In both countries, the time periods are determined by the times at which the public opinion surveys were fielded.

There are several key trends that can be observed in the attention data. First, while there is significant variation in attention over time and between issues, attention is strongly correlated between women and men representatives in both countries. Differing from the issue salience figures, there are not the same clear gender differences in which women or men consistently prioritize an issue over the other. In the United States and UK, women representatives appear to give more attention to crime and education, while men representatives appear to give more attention to and, to some degree, the economy. Notably, attention to health and the economy attracts the most attention in both countries, which appears to be the case even before the COVID-19 pandemic and is fairly consistent with the issue salience figures above (see Figures 1 and 2).

### *Estimation*

To estimate the effects of public salience on representatives' attention, I rely on two strategies.<sup>6</sup> In the first estimation strategy, I estimate the effects of public salience on representatives' attention using vector autoregressions (VARs). This strategy included aggregating the data by representatives' gender and creating a time-series for each country—two vectors for representatives attention (by gender) and two vectors for public salience (by gender). In the second estimation strategy, I estimate the effects of public salience on representatives' attention using fixed effects regressions. This strategy included using individual-level data which includes measures for each representative separately and therefore allows for the inclusion of various control variables at the individual legislator level. While each estimation strategy has its own strengths and weaknesses, the two strategies are complementary and are intended to provide a

**Figure 3**  
**Dynamic issue attention of United States representatives by gender**



**Note:** The y-axis is percentage of representatives' Twitter messages that address a specific issue as a proportion of their messages about all issues. Data are presented using 4-month time periods for attention. Descriptive statistics are available in online appendix C.

more robust understanding of the relationship between public issue priorities and representatives' attention.

The vector autoregression models are particularly well suited for an analysis of the time series data because each variable in the series is modelled as a function of its lagged outcomes and the lagged outcomes of the other variables in the series. This strategy not only accounts for the temporal structure of the data, it also allows for estimation of the influence of all the variables in the series on each other. For example, while the expectation is that representatives respond to public salience (i.e., public salience predicts representatives' issue attention), it is also possible that representatives lead the public in their attention to issues. The VAR approach allows for disentangling these relationships. Similar strategies have also been employed in the analysis of dynamic social media data (Widmann 2022) and specifically in analyses of responsiveness from politicians (Gilardi et al. 2022; Barberá et al. 2019). A shortcoming of the VAR models, however, is that each series in the model is pooled, which means that the results average

over differences across the various issue domains included in the analysis. I address this concern with the fixed effects models in the second estimation strategy described further in the fixed effects estimation.

The VAR models can be formalized using the following equation:

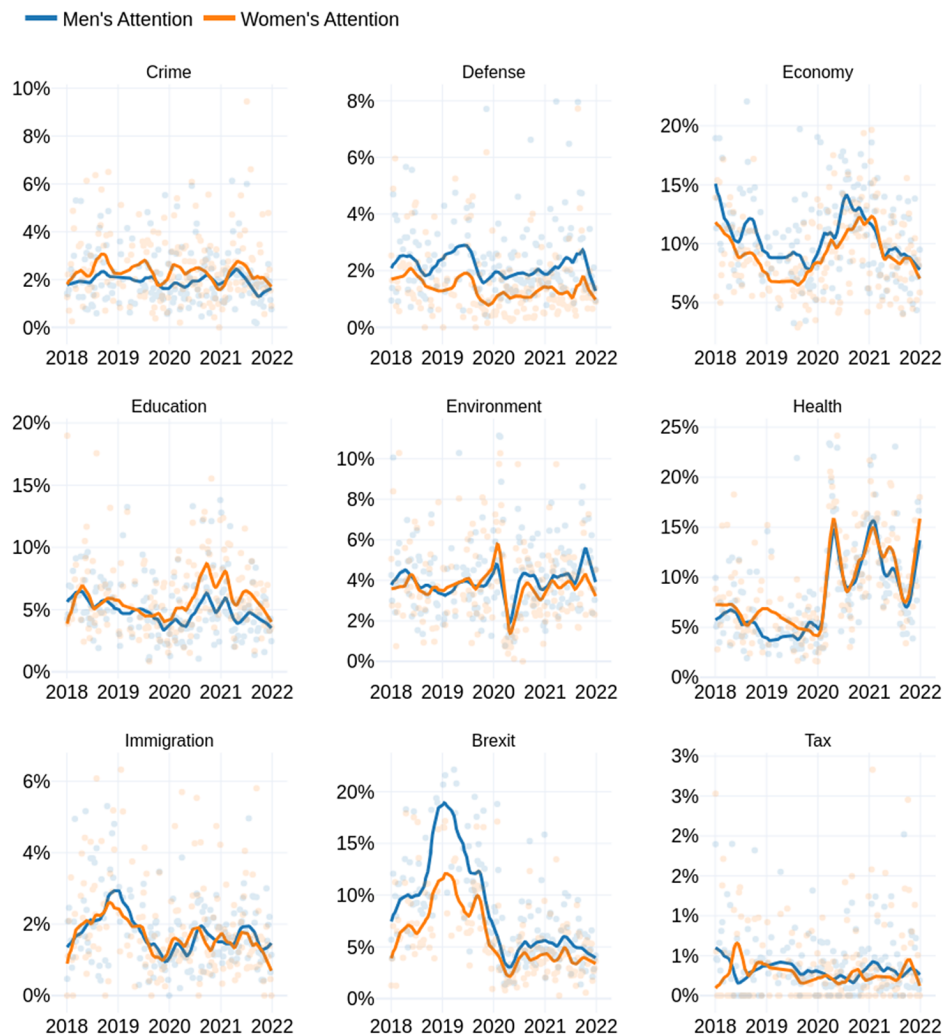
$$Z_{g,i,t} = \alpha + \sum_i \sum_{p \leq 10} \beta_{p,i} Y_{g,i,t-p} + M_{g,t-p} + N_{t-p} + \varepsilon_{g,i,t} \quad (1)$$

Where  $Z_{g,i,t}$  is the attention of representatives with gender  $g$  to issue  $i$  at time  $t$ ,  $Y_{g,i,t-p}$  is the salience of issue  $i$  for gender  $g$  at time  $t-p$ ,  $M_{g,i,t-p}$  is representatives' lagged attention at time  $t-p$ , and  $N_{t-p}$  is lagged issue salience at time  $t-p$ .

For each specification, the lag structure was selected using the optimal AIC (Akaike information criterion) for the series with an upper bound of 10 lags (approximately 10 weeks) (Wei 2019; Akaike 1969). In both countries, the optimal lag structure was identified as 9 periods using the AIC. I present



**Figure 4**  
**Dynamic issue attention of United Kingdom representatives by gender**



**Note:** The y-axis is percentage of representatives' Twitter messages that address a specific issue as a proportion of their messages about all issues. Data are presented using using 4-month rolling average. Descriptive statistics are available in online appendix C.

all results from the time series specifications as cumulative impulse response functions (IRFs). This method presents the cumulative effects of one series on another series given a 1 standard deviation increase. This provides an understanding of the ways in which the effects of one variable act on another over time. All estimates were made using the `statsmodels` library in Python (Seabold and Perktold 2010). For all proportion data (e.g. attention and salience), I use the log ratio, which is common practice when using compositional data (Greenacre 2021).

## Results

### *Responsiveness to Public Issue Priorities*

I present the results of the VAR models in two ways. First, I present the results in table format in online appendix F.

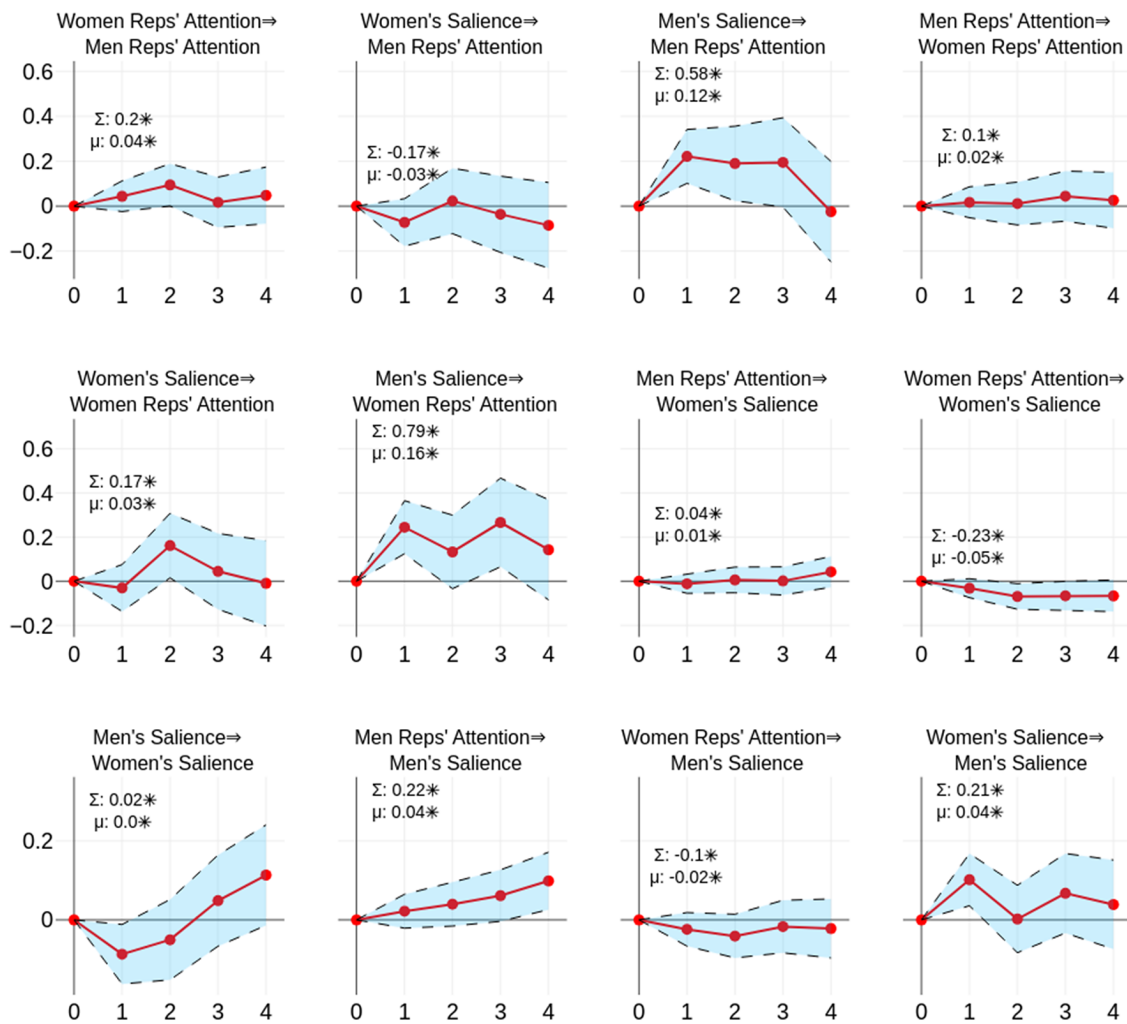
Second, I visualize the results as cumulative impulse response functions (IRFs) that capture the dynamic effects of public salience on representatives' attention in Figure 5 and Figure 6. At first glance, the figures can appear overwhelming given that each of the variables in the series—women's and men's issue salience and women and men representatives' attention—can influence *and be influenced by* the other variables in the series. However, both figures follow the same pattern. In each of the two figures, each subplot is labeled according to the influencing variable and the variable that is influenced. For example, the first subplot in the first row of Figure 5 that is labeled "Women Reps' Attention → Male Reps' Attention" presents the estimates for the cumulative effects of women representatives' attention on men representatives' attention. The cumulative effects are portrayed dynamically over four survey periods

in each subplot, which amounts to approximately four weeks. A red line captures that estimate, and the shaded area indicates 95% confidence intervals. Additionally, in each subplot, the cumulative effect and the average effects over the four survey periods is presented in the top left-hand corner of each respective subplot. In the case that the estimates meet the threshold for Granger causality (Granger and Newbold 2014), which means that lagged changes in the influencing variable consistently predict subsequent changes in the outcome variable, the estimates are accompanied by a star.

Of particular interest in each of the two figures are estimates that capture the influence of women’s and men’s

salience on the attention of women and men representatives. The U.S. results in Figure 5 suggest that when holding constant the influence of the other variables in the series, women’s salience actually has a negative influence on the attention of men representatives. This indicates that men representatives ignore changes in women’s salience, likely focusing on different issues entirely or reducing their attention to issues that increase in salience for women constituents. In contrast, women’s salience is indeed a positive predictor of women representatives’ attention. Moreover, men’s salience is a positive predictor of the attention of both men and women representatives in the United States. The influence of men’s salience appears

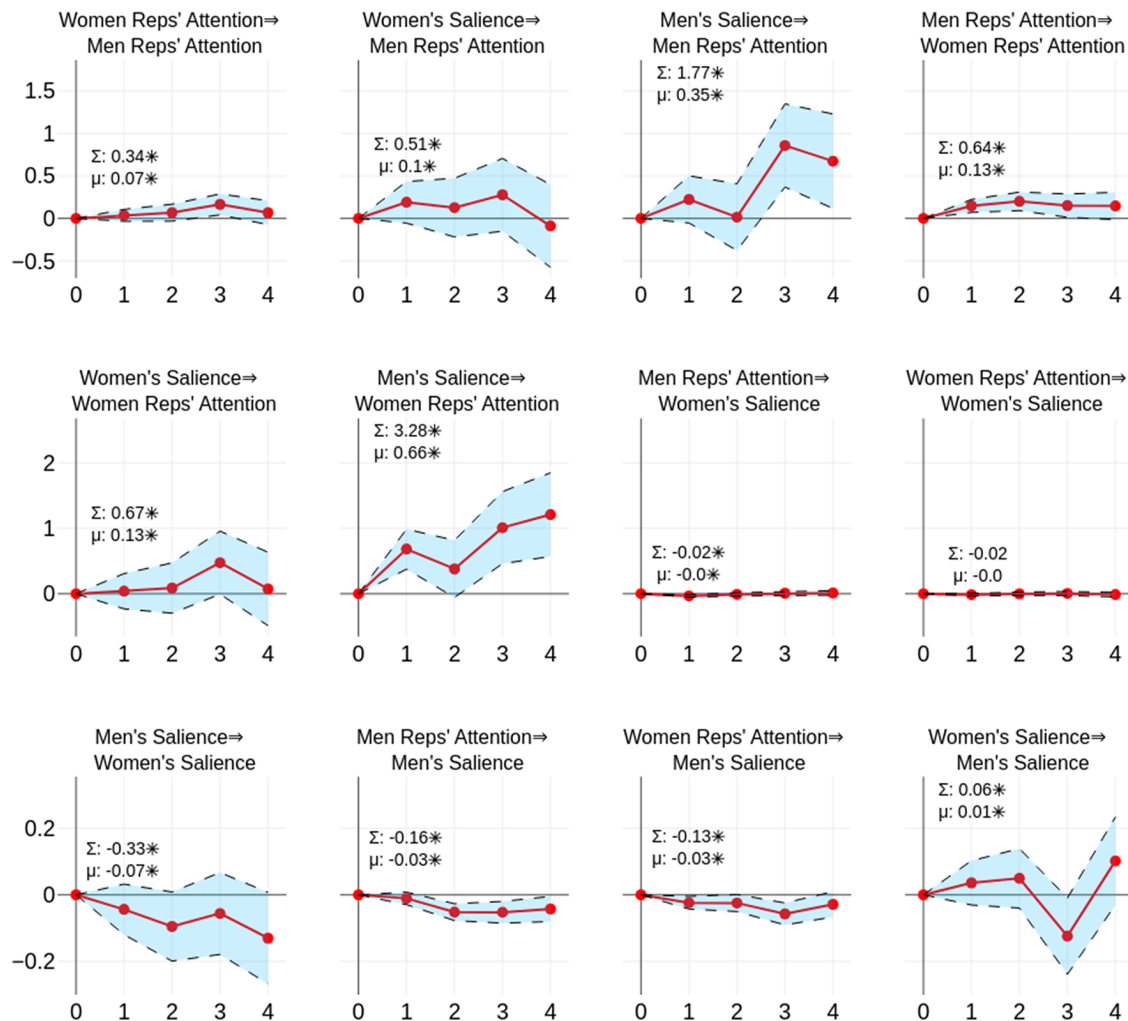
**Figure 5**  
**U.S. cumulative IRF responses—Public issue salience and representatives’ attention**



Cumulative Effect Estimates and 95% Confidence Intervals. VAR(9) Model.  
 $\Sigma$  = Cumulative Effect;  $\mu$  = Mean Effect; \* = Granger causality (p-value < 0.05)

**Note:** Cumulative IRF orthogonal effects from pooled VAR models that include women and men’s issue priorities and MCs’ attention. Dotted lines indicate 95% confidence intervals. The red lines represent the dynamic estimates, and the solid black lines indicate the cumulative effects over the course of four survey periods (approximately four to six weeks). Full results are presented in online appendix F.

**Figure 6**  
**UK cumulative IRF responses—Public issue salience and representatives' attention**



Cumulative Effect Estimates and 95% Confidence Intervals. VAR(9) Model.  
 $\Sigma$  = Cumulative Effect;  $\mu$  = Mean Effect; \* = Granger causality (p-value < 0.05)

**Note:** Cumulative IRF orthogonal effects from pooled VAR models that include women and men's issue priorities and male and female representatives' issue attention. Dotted lines indicate 95% confidence intervals. The red lines represent the dynamic estimates, and the solid black lines indicate the cumulative effects over the course of four survey periods (approximately four to six weeks). Full results are presented in online appendix F.

to be a greater predictor than women's salience for both women and men representatives in the United States.

A similar pattern is observable in the UK results in Figure 6. In the UK, the estimates are larger in magnitude likely given that survey respondents can identify up to three issues that are believed to be the most important; however, within-country comparisons between men and women representatives reveal a similar pattern in the UK. Women's salience is much less predictive of the attention of both men and women representatives compared to men's salience. At the same time, women representatives are more responsive to changes in women's and men's salience than men representatives.

One advantage of the VAR models is that they allow for disentangling the direction of influence between the public and representatives. This is especially important given that the direction of influence is not always unidirectional. For example, it is possible that representatives' attention influences public salience, rather than the other way around. This finding would be consistent with the idea that political elites are often able to shape public opinion (Ura 2014). In the U.S. case, there is some support for this idea in the results. Namely, men representatives' attention appears to have a small but consistent influence on men's salience. However, this dynamic is not observable in the UK, and the results indicate that to the extent there is a

relationship between representatives' attention and public salience, there is much greater evidence that the public shapes the attention of representatives than the other way around. This is highlighted by the fact that the influence of representatives' attention on public salience is close to zero and even negative in some cases.

Another advantage of the VAR models is that they allow for understanding how men and women representatives influence each other. In both countries, the influence appears to be small when controlling for the salience of both women and men separately.

Taken together, the results in Figure 6 and Figure 5 suggest that representatives are indeed responsive to public issue priorities, though the degree of responsiveness varies between the two countries and by gender makeup of public salience. In both countries, however, men's salience is a much better predictor of representatives' attention, indicating that representatives are more responsive to men in relation to women. Moreover, this finding holds regardless of the gender of the representative, as women representatives are more responsive to men than women. When it comes to responsiveness to women's salience, women representatives appear to be more responsive in both countries. This finding is consistent with the idea that women representatives are more likely to act in the interests of the women they represent (Lowande, Ritchie, and Lauterbach 2019; Funk and Philips 2019).

### Fixed Effects Estimation

The results from the time series models indicate that women representatives are more responsive to the salience of a number of issues according to both men and women constituents. These results were consistent in both the United States and the UK. To add robustness to the results, and to consider the individual level structure of the data, I additionally estimated a series of high-dimensional fixed-effects models with the individual level data. High-dimensional fixed effects models allow for multiple fixed effects parameters to be included in the same model by using maximum likelihood estimation (Bergé et al. 2018). These models therefore allow for including fixed effects parameters for each legislator, survey period, and issue. The specification can be formalized as follows:

$$Y_{i,j,t} = MIP_{g,i,t} + Gender_i + \beta(MIP_{g,i,t} \times Gender_i) + Z_{i,t} + \gamma_i + \delta_t + \lambda_j + \varepsilon_{g,i,t} \quad (2)$$

Where  $Y_{i,j,t}$  is the attention of representative  $i$  to issue  $j$  at time  $t$ .  $MIP_{g,j,t}$  is the salience of issue  $j$  for constituents of gender  $g$  at time  $t$ , and is interacted with a binary variable (*Gender*) that captures the gender of the representative  $i$ .

$Z$  is the vote share received by legislator  $i$  at the previous election.  $\gamma_i$ ,  $\delta_t$ ,  $\lambda_j$  are fixed effects parameters for each legislator, survey period, and issue, respectively.

The parameter of interest is  $\beta$ , which captures the interaction between the salience of issue  $i$  and the gender of the representative. This term captures the marginal effect of representatives' gender on responsiveness to the constituents identified in the *MIP* term (e.g., either women or men).

I present the results of the estimations in two ways. First, I present the full results in table form in online appendices G and H. Second, I present the results as a coefficient plot in Figure 7. Each estimated coefficient is from a separate model and indicates the marginal difference between women and men representatives responsiveness to either women or men constituents. The estimates are presented with 95% confidence intervals.

The results from the fixed effects specifications confirm the conclusions drawn from the time series specifications. In both the United States and the UK, there is a stronger association between public salience and women representatives' attention compared to men representatives. Moreover, these trends apply separately to both women's and men's salience, as the issue salience according to either group is a better predictor of women representatives' attention than men representatives' attention. These results add robustness to the findings from the time series specifications and further highlight a gender gap in how men and women representatives allocate their attention to the issue priorities of the British and American public.

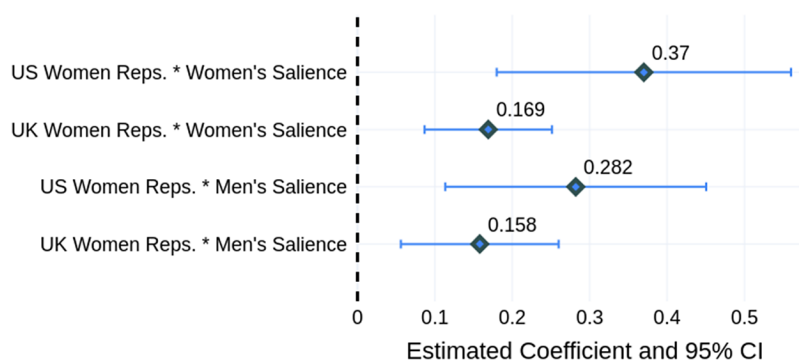
### Robustness Tests

The results presented in the analysis paint a coherent picture, with women representatives more responsive in both countries to changes in the salience of both men and women constituents. To ensure the results are robust to the assumptions made within the primary analyses, I considered several potential scenarios that may explain the observed results.

*Alternative model specifications.* To ensure that the results are not driven by the specific model specification, I re-estimated the fixed effects models using Poisson regression with the same fixed effects parameters outlined in Equation 2. These count models use the number of tweets about a given issue that corresponds with the public opinion data as the dependent variable. The results suggest a statistically significant marginal difference between women and men representatives when responding to women's salience and men's salience in the UK. In the case of the estimated influence of men's salience on representatives' attention, the marginal difference between women and men does not meet the threshold for traditional levels of significance. Nonetheless, the results are



**Figure 7**  
**Marginal effect estimates for responsiveness to women and men's salience by women representatives**



**Note:** Marginal effects estimates from the interaction between representatives' gender and issue salience for women and men in the United States and UK. Standard errors are clustered by time and representative. Full results are presented in online appendices G and H. Estimates correspond with Models 1 and 4 in the appendix tables.

consistent with the primary findings. I present the full results in online appendix J.

*Position in government.* Although the primary analyses consider a large amount of data from many actors, there is only limited variation in which parties are in government. In the UK, the Conservative Party was in government for the entire period of the analysis, and in the United States, the Democratic Party held a majority in the House of Representatives during most of the time of the analysis. To ensure that the results are not driven solely by the governing parties, I re-estimated the fixed effects models after sub-setting the data to only include Labour Party MPs in the UK and Republican Party MCs in the United States. The results—presented in online appendix I—are consistent with the primary findings and similarly highlight that women representatives are more responsive to changes in women's and men's issue salience when including only the minority/opposition party in each country.

Taken in full, the results from the primary analyses and the robustness checks confirm support for the hypothesis that women representatives are more responsive to changes in issue salience compared to men representatives. This finding is consistent across two countries and is robust to a number of alternative model specifications.

## Discussion and Conclusion

A number of studies have shown that conditional on being elected, women in politics are more likely to act in the interests of their constituents (Anzia and Berry 2011; Thomsen and Sanders 2020). Yet while these studies convincingly demonstrate that women representatives indeed are proactive in advancing the interests of constituents, the extent to which women representatives lead in responding to public opinion has remained unclear.

Focusing on dynamic responsiveness, this study examined the degree to which representatives use social media to respond to the changing salience of public issue priorities. The findings reveal that while representatives in both countries are generally responsive to public opinion, there are important gender disparities in whose voices are heard. Across multiple empirical analyses, I find that dynamic salience of men constituents is more predictive of representatives' attention than the issue salience of women constituents. However, this gap is mitigated by the behavior of women representatives, who consistently shift their attention in line with the changing salience of women constituents. This over-performance by women representatives in responsiveness does not come at the expense of reduced responsiveness to men's priorities. Rather, men's issue salience is also a positive predictor of women representatives' attention—even more so than it is for men representatives' attention. In other words, women representatives are more responsive to women and men constituents than men representatives. These results were consistent across two countries and were robust to a number of alternative model specifications and robustness checks.

These results contribute to our understanding of elite-voter responsiveness and gender representation in several ways. First, the findings underscore the important representational benefits that women legislators provide—not only in terms of the substantive representation of women constituents, but for the electorate as a whole. In this regard, it is noteworthy that men receive greater responsiveness from women representatives than men representatives. This finding extends the over-performance argument beyond the findings of previous studies that point to over-performance of women on behalf of all constituents and instead suggests

that men as a separate group also benefit from the over-performance of women elites.

Second, by moving beyond the proactive behaviors of representatives, the study creates a wider understanding of the ways in which women representatives lead in representing the interests of their constituents dynamically. Specifically, by focusing on representatives' dynamic communication outside of formal legislative settings, the study offers new insights into the ways in which public opinion shapes the communication strategies of representatives.

Finally, the study advances our understanding of how representatives may use alternative channels like social media to signal awareness of constituent priorities. Party discipline and political institutions can limit the ability of representatives to act in an individual capacity (Kam 2009; Clayton and Zetterberg 2021). However, social media mitigates some of these constraints and allows representatives to build individual policy reputations and to advance issue agendas (Russell 2021a, 2021b). This study extends that literature by showing that representatives also use social media as a means to respond to changes in the electorate's attitudes as well.

While the study provides a comprehensive analysis of gender disparities in issue responsiveness across two countries in the context of political communication on social media, several limitations and avenues for future research remain. First, there is a limit to the extent to which representatives' communication on social media can be interpreted as substantive representation. Although studies find that social media (and Twitter in particular) is important for voters who indeed prefer that their representative emphasize their issue priorities online (Giger et al. 2021), talk is cheap and representatives are not obligated to follow through on promises made on social media. However, existing studies find high levels of correspondence between representatives' online behavior and their behavior within the legislature (Peeters, Van Aelst, and Praet 2021; Silva and Proksch 2022). Moreover, research also suggests that the public places a high value on the verbal representation of their issue priorities (Reher 2016), which indicates that voters may view this form of responsiveness as representation specifically. With that said, future studies may benefit from extending a similar type of dynamic analysis to include other forms of representative behavior, such as bill sponsorship or voting behavior.

The generalizability of the findings to other contexts is a second consideration. The study focuses on two countries with first-past-the-post electoral systems and single member districts. As the primary mechanisms behind the over-performance argument are thought to be related to the electoral system and the gendered nature of the political environment, contexts in which these factors are different may not produce the same patterns. Future studies may benefit from extending the analysis to other

countries with different electoral systems and political environments.

A final limitation to the findings is that they are based on an analysis in which the "effect" of gender is not causally identified. As there are infinite characteristics endogenous to gender, this limitation serves as a word of caution when interpreting the results of the study in a causal way. Future studies may benefit from adopting a research design that allows for making more credible causal claims about the influence of gender on legislative behavior.

## Supplementary material

To view supplementary material for this article, please visit <http://doi.org/10.1017/S153759272400104X>.

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## Notes

- 1 Although see Hargrave and Blumenau (2022) and Hargrave (2023) for a different perspective in the British context.
- 2 Data and code required to verify the replication of this analysis are available in Dickson (2024b).
- 3 Methodology and all available downloads for the YouGov surveys are available for the UK and United States, respectively.
- 4 In addition to the 9 issues presented in Figure 2, I also included a category for messages that did not pertain to any of the available issues. These messages were non-political and might include, for example, "Happy New Years" or "Happy 4th of July".
- 5 For example, in the individual datasets,  $\text{Attention}_{[i,j,t]}$  =  $\frac{\text{Number of tweets legislator } i \text{ sends about issue } j \text{ at time } t}{\sum_j \text{Number of tweets legislator } i \text{ sends at time } t}$ .
- 6 These two strategies required different datasets. In the first datasets (one for each country), I created time series for women and men representatives attention and women and men's salience. The result was a  $1632 \times 4$  matrix for the United States and a  $1638 \times 4$  matrix for the UK, indexed by issue and date. (Each dataset contains four series—one of men representatives' attention, one for women representatives' attention,

one for men's salience and one for women's salience. In the U.S, data, there were 204 surveys with 8 issues (1,632) and the UK data had 182 surveys with 9 issues (1,638.) In the second datasets for the individual level analysis, I indexed the data according to representative, issue, and date of the survey, with a separate column for representatives' gender. In both datasets, the public salience data were matched on issue and survey date. Descriptive statistics are provided in online appendices B and C.

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