Online Appendix

"Internal Versus Institutional Barriers to Gender Equality: Evidence From British Politics"

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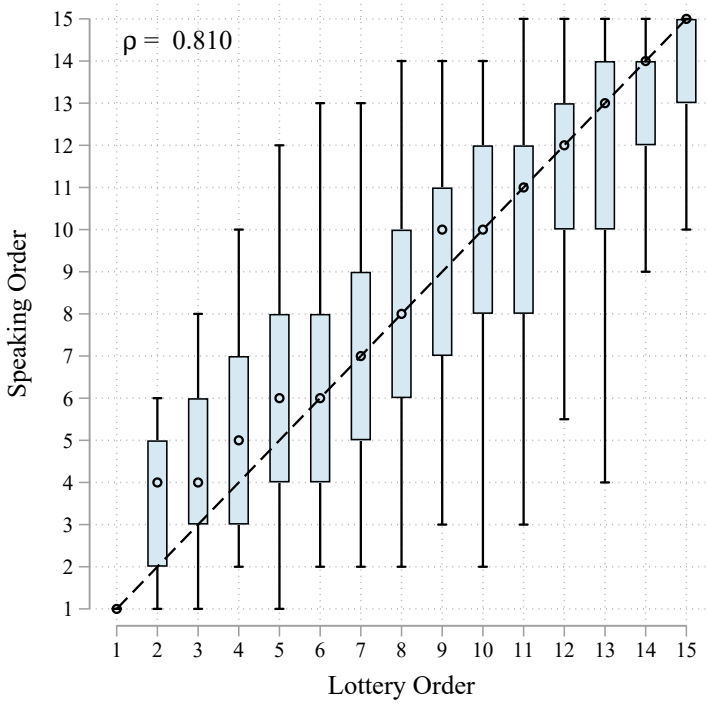
Table A1: Balance Test for Lottery Speaking Order (2015 to 2023)

	Male (1)	Age (2)	Years Experience (3)	Voter Turnout (4)	Vote Margin (5)	Labour (6)	Conservative (7)	Number Of Wins (8)
				Panel A: All Entrants				
Lottery Order	0.001	-0.038	-0.011	-0.007	0.053	-0.002	0.001	0.000
	(0.002)	(0.045)	(0.035)	(0.023)	(0.066)	(0.002)	(0.002)	(0.004)
				Panel B: Female Entrants				
Lottery Order		-0.070	-0.017	-0.014	0.055	-0.001	0.000	-0.001
		(0.076)	(0.044)	(0.051)	(0.117)	(0.004)	(0.003)	(0.007)
				Panel C: Male Entrants				
Lottery Order		-0.039	-0.018	-0.016	0.004	-0.001	-0.000	0.001
		(0.058)	(0.048)	(0.026)	(0.085)	(0.002)	(0.003)	(0.005)
All Winners Observations	3,652	3,652	3,652	3,652	3,652	3,652	3,652	3,652
Outcome Mean	.66	51	8	67	22	.36	.47	.93
Lottery FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The data includes all lottery winners for the 258 lotteries with available Hansard transcripts (used to measure actual speaking order) from May 2015 to March 2023. Lottery order is the random speaking order among lottery winners (which the Speaker can deviate from). Outcome variables are: (1) dummy variable for male, (2) age when entered this lottery, (3) years since first entering the House of Commons, (4) voter turnout when last elected to Parliament, (5) vote margin when last elected to Parliament, (6) dummy variable for elected as Labour MP, (7) dummy variable for elected as Conservative MP, and (8) number of PMQs lottery wins since this session started. Standard errors are clustered at the MP-level. *** p<0.01, ** p<0.05, * p<0.1.

Figure A1: Speaking Order Versus Lottery Order



Notes: This figure shows the box plot of actual speaking order by random lottery order values, for the 258 PMQs lotteries with available Hansard transcripts (used to measure actual speaking order) from May 2015 to March 2023. Circles represent the median, and the blue boxes represent the interquartile range. The whiskers are defined by the interval $[q_1 - 1.5iqr, q_3 + 1.5iqr]$ where q_1 and q_3 are the 1st and 3rd quartiles respectively and iqr is the interquartile range. The correlation coefficient between speaking order and lottery order is shown in the top-left corner.

Table A2: Gender Does Not Predict Speaking Order Conditional on Controls

	Speaking Order			
	(1)	(2)	(3)	(4)
Lottery Order	0.808***	0.810***	0.809***	0.809***
	(0.010)	(0.008)	(0.008)	(0.008)
Female	0.876***	-0.010	-0.013	-0.001
	(0.163)	(0.064)	(0.064)	(0.067)
Conservative		-3.537***		
		(0.077)		
Observations	3,652	3,652	3,652	3,652
Lottery FE	Yes	Yes	Yes	Yes
Party FE	No	No	Yes	Yes
Cohort FE	No	No	No	Yes

Notes: The unit of observation is MP-lottery, including 258 lotteries with available Hansard transcripts from 2015 to 2023. The sample includes only lottery winners. Speaking Order is the actual order in which MPs speak during the PMQs, ranging from 1 to 15. Lottery Order is the order in which MPs are randomly drawn from the weekly lottery, ranging from 1 to 15. Conservative is a dummy variable equal to one if the MP is a member of the Conservative party. Standard errors are clustered at the MP-level throughout. *** p<0.01, ** p<0.05, * p<0.1.

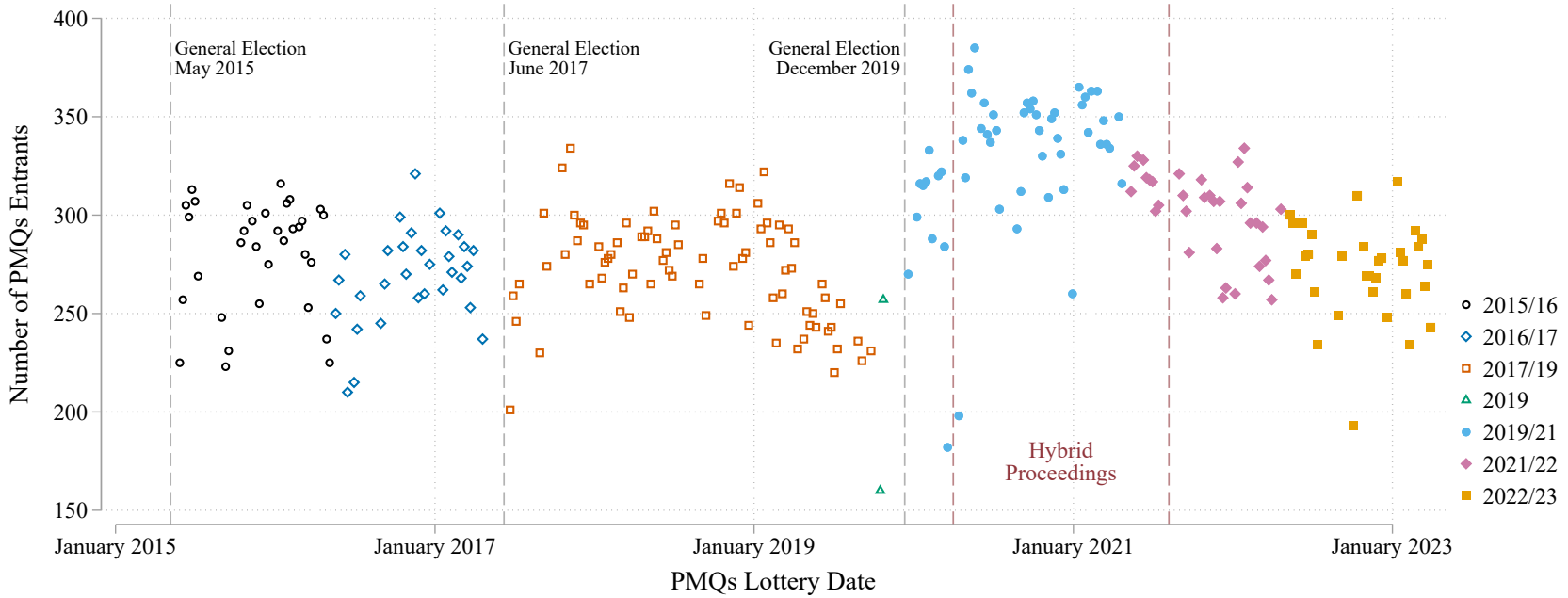
Figure A2: Prime Minister's Questions Hybrid Proceedings

Notes: The screenshot shows an example of PMQs during COVID-19, when attendance switched to a hybrid format (maximum 50 MPs allowed in the chamber). This specific PMQs, which took place on April 22nd 2020, can be found on YouTube at this link.

Figure A3: Non-Prime Minister's Questions Times Are Less Well-Attended

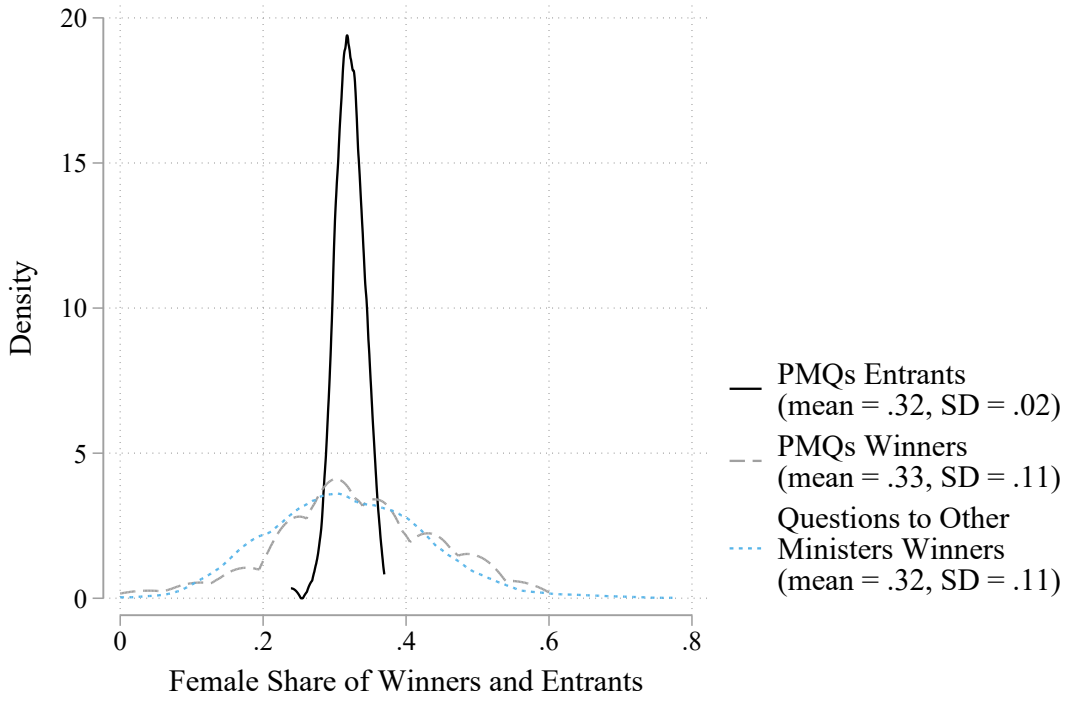
Notes: The screenshots show attendance at PMQs (top) and Cabinet Office questions (bottom) on the same date, April 27, 2016. We count visible attendance as 241 for PMQs and 72 for questions to the Cabinet Office. These numbers are similar to what we estimate for random samples of pre-pandemic question times (220 vs. 78).

Figure A4: Timeline and Number of Lottery Entrants



Notes: The figure shows the number of entrants for each of the 264 PMQs lotteries in our data. The colors differ by parliamentary session. The vertical dashed lines denote the three general elections during this period, and the period in which PMQs followed hybrid proceedings.

Figure A5: Extrapolating From the Female Share of Winners to the Female Share of Entrants



Notes: This figure shows probability density functions for the female share of pre-hybrid (i) PMQs lottery entrants, (ii) PMQs lottery winners, and (iii) Questions to Other Ministers lottery winners.

Table A3: Balance Test for Winning the PMQs Lottery (2015 to 2020)

	Male (1)	Age (2)	Years Experience (3)	Voter Turnout (4)	Vote Margin (5)	Labour (6)	Conservative (7)	Number Of Wins (8)
				Panel A: All Entrants				
Won PMQs Lottery	-0.009	-0.180	-0.078	-0.063	0.188	0.005	-0.009	-0.010
	(0.010)	(0.237)	(0.189)	(0.108)	(0.318)	(0.011)	(0.010)	(0.023)
				Panel B: Female Entrants				
Won PMQs Lottery		-0.153	0.315	0.110	-0.333	0.011	-0.014	0.038
		(0.431)	(0.256)	(0.210)	(0.597)	(0.019)	(0.016)	(0.039)
				Panel C: Male Entrants				
Won PMQs Lottery		-0.171	-0.218	-0.131	0.436	-0.001	-0.004	-0.033
		(0.279)	(0.241)	(0.125)	(0.375)	(0.012)	(0.013)	(0.028)
All Entrants Observations	43,044	43,044	43,044	43,044	43,044	43,044	43,044	43,044
Full Sample Outcome Mean	.68	51	7.9	67	21	.4	.44	1
Lottery FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

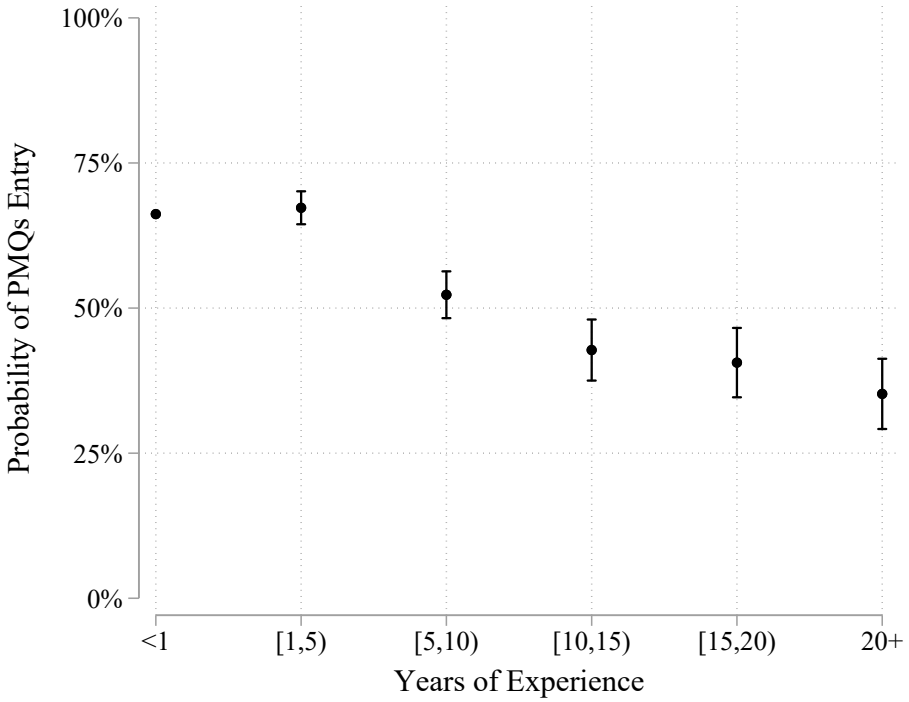
Notes: The data includes the full set of lottery entrants for the 157 lotteries from 2015/16 until the switch to hybrid proceedings in April 2020. Outcome variables are: (1) dummy variable for male, (2) age when entered this lottery, (3) years since first entering the House of Commons, (4) voter turnout when last elected to Parliament, (5) vote margin when last elected to Parliament, (6) dummy variable for elected as Labour MP, (7) dummy variable for elected as Conservative MP, and (8) number of PMQs lottery wins since this session started. Standard errors are clustered at the MP-level. *** p<0.01, ** p<0.05, * p<0.1.

Table A4: Balance Test for Winning the PMQs Lottery (2015 to 2023)

	Male (1)	Age (2)	Years Experience (3)	Voter Turnout (4)	Vote Margin (5)	Labour (6)	Conservative (7)	Number Of Wins (8)
				Panel A: All Entrants				
Won PMQs Lottery	-0.009	-0.088	-0.093	0.174*	-0.130	-0.004	-0.008	0.004
	(0.008)	(0.183)	(0.140)	(0.091)	(0.241)	(0.008)	(0.008)	(0.019)
				Panel B: Female Entrants				
Won PMQs Lottery		-0.019	0.131	0.492***	-0.633	-0.002	-0.011	0.013
		(0.301)	(0.165)	(0.189)	(0.454)	(0.014)	(0.013)	(0.025)
				Panel C: Male Entrants				
Won PMQs Lottery		-0.088	-0.154	0.032	0.135	-0.008	-0.003	-0.000
		(0.228)	(0.188)	(0.099)	(0.282)	(0.009)	(0.010)	(0.025)
All Entrants Observations	75,804	75,804	75,804	75,804	75,804	75,804	75,804	75,804
Full Sample Outcome Mean	.66	51	8.1	67	22	.36	.47	.91
Lottery FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The data includes the full set of lottery entrants for the 264 lotteries from 2015/16 to 2022/23. Outcome variables are: (1) dummy variable for male, (2) age when entered this lottery, (3) years since first entering the House of Commons, (4) voter turnout when last elected to Parliament, (5) vote margin when last elected to Parliament, (6) dummy variable for elected as Labour MP, (7) dummy variable for elected as Conservative MP, and (8) number of PMQs lottery wins since this session started. Standard errors are clustered at the MP-level. *** p<0.01, ** p<0.05, * p<0.1.

Figure A6: Experienced MPs Are Less Likely to Submit Questions



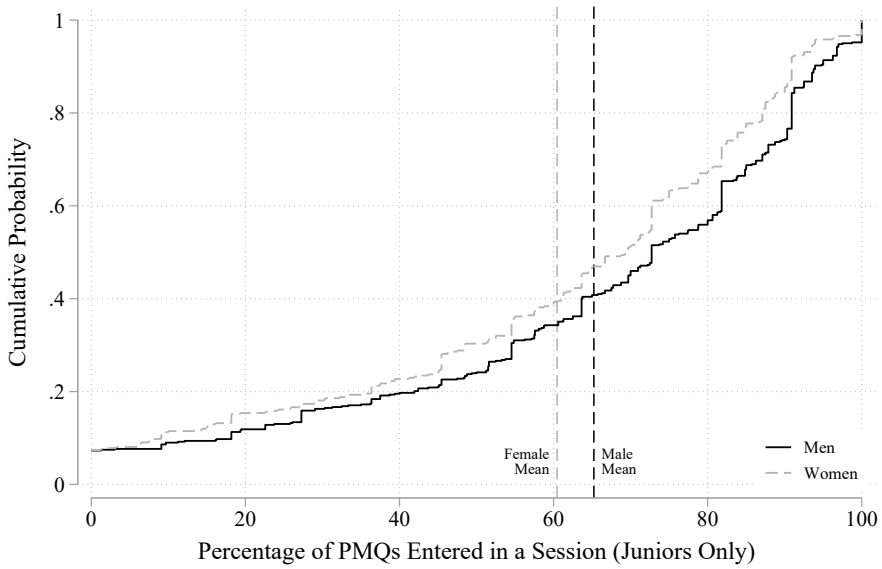
Notes: The figure shows the coefficients and confidence intervals from a regression of PMQs lottery entry from 2015 to 2023 on dummy variables for different levels of experience and lottery fixed effects. The effects are shown relative to the raw mean for PMQs-eligible MPs with less than one year of experience. Standard errors are clustered at MP-level.

Table A5: How Do Characteristics of Male and Female MPs Differ?

	Age (1)	Elections Lost (2)	Years Experience (3)	Vote Margin (4)	Labour (5)	Conservative (6)	BAME (7)	State School (8)	University (9)	Oxbridge (10)	Politics Job (11)	Born Abroad (12)	Born Outside England (13)
						Panel A: Lottery FEs							
Female	-2.48***	-0.29***	-4.45***	0.16	0.26***	-0.25***	0.08***	0.13***	0.07**	-0.04	0.02	0.05*	0.04
	(0.93)	(0.06)	(0.72)	(1.24)	(0.04)	(0.04)	(0.03)	(0.04)	(0.03)	(0.03)	(0.04)	(0.02)	(0.04)
						Panel B: Lottery and Cohort FEs							
Female	1.07	-0.23***	-0.04	2.06*	0.31***	-0.27***	0.07***	0.08*	0.07**	-0.02	0.02	0.05**	0.02
	(0.77)	(0.06)	(0.05)	(1.19)	(0.04)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.04)	(0.02)	(0.04)
						Panel C: Lottery, Cohort, and Party FEs							
Female	1.05	-0.09	0.04	1.05			0.05*	-0.01	0.07**	-0.00	-0.05	0.05**	0.03
	(0.80)	(0.06)	(0.06)	(1.20)			(0.03)	(0.04)	(0.03)	(0.04)	(0.04)	(0.02)	(0.04)
Observations	87,137	87,137	87,137	87,137	87,137	87,137	86,616	79,933	85,673	85,726	83,143	69,381	69,381
Number of MPs	890	890	890	890	890	890	876	760	843	840	841	687	687
Male Mean	53	.67	12	24	.36	.5	.052	.46	.8	.24	.38	.038	.26

Notes: The data includes the full set of eligible MPs for the 157 lotteries from 2015/16 until the switch to hybrid proceedings in April 2020. Each panel includes a different set of fixed effects. Outcome variables are: (1) age when entered this lottery, (2) number of parliamentary elections lost prior to first entering the House of Commons, (3) years since first entering the House of Commons, (4) vote margin when last elected to Parliament, (5) dummy variable for elected as Labour MP, (6) dummy variable for elected as Conservative MP, (7) dummy variable for Black, Asian or Minority Ethnic, (8) dummy variable for educated in a comprehensive/academy/state-funded non-selective school, (9) dummy variable for having graduated from university, (10) dummy variable for having attended Oxford or Cambridge university, (11) dummy variable for having had a politics-adjacent job prior to entering the House of Commons, (12) dummy variable for being born outside of the UK, and (13) dummy variable for being born outside of England. Standard errors are clustered at the MP-level. *** p<0.01, ** p<0.05, * p<0.1.

Figure A7: Cumulative Distribution Function of Percentage of PMQs Lotteries Entered



Notes: The figure shows the cumulative distribution function of the percentage of PMQs lotteries entered when eligible to, using the pre-hybrid 2015 to 2020 data collapsed to the MP-session-level, and only MPs that joined the House of Commons since the 2015 general election. We exclude the 2019 session in which there were only two PMQs lotteries. The CDF is plotted separately for female and male MPs. The data includes 181 females and 238 males (409 female-session and 523 male-session observations).

Table A6: What Types of Women Are More Likely to Submit Questions?

	Entered (Female MPs)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Age	0.25								0.38**
	(0.16)								(0.17)
Black, Asian or Minority Ethnic		-9.00**							-7.46
		(4.52)							(4.56)
State-Schooled			-5.41						-4.36
			(3.95)						(3.84)
University Degree				-2.87					-1.98
				(4.94)					(4.87)
Attended Oxbridge					0.04				3.14
					(4.22)				(4.40)
Politics-Related Previous Job						-1.61			-0.60
						(3.41)			(3.30)
Born Outside of the UK							-9.82		-8.51
							(6.68)		(8.35)
Born Outside of England								-5.66	-0.96
								(5.19)	(6.06)
Observations	28,045	27,877	24,230	27,296	27,278	26,987	22,286	22,286	28,045
Number of MPs	293	287	231	272	270	276	224	224	293
Lottery FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Party FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

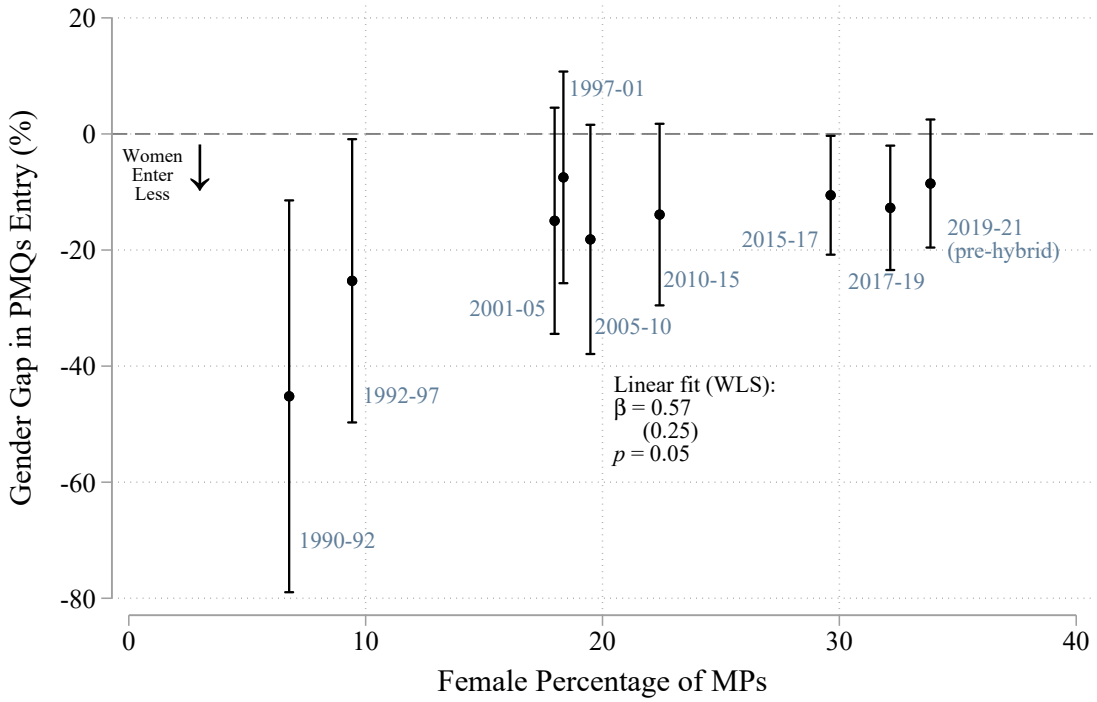
Notes: The unit of observation is MP-lottery (i.e. the stacked specification), with 157 lotteries from 2015 to 2020 (the pre-hybrid era). The sample includes female MPs eligible to enter each lottery (those without a government position). Entered is a variable equal to 100 if the MP entered the PMQs lottery and zero otherwise. Coefficients can then be interpreted as percentage point effects. All control variables shown are dummy variables, with the exception of Age, which is in years. To avoid losing observations due to missinginess, column 9 additionally includes dummy variables for each control being missing, and each control is set to -99 when missing. Standard errors are clustered at the MP-level throughout. *** p<0.01, ** p<0.05, * p<0.1.

Table A7: What Types of Men Are More Likely to Submit Questions?

	Entered (Male MPs)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Age	0.24								0.24
	(0.16)								(0.17)
Black, Asian or Minority Ethnic		-0.04							-0.96
		(5.10)							(5.31)
State-Schooled			2.96						2.70
			(3.10)						(3.14)
University Degree				-0.32					3.11
				(3.60)					(3.70)
Attended Oxbridge					-7.18**				-7.26**
					(3.46)				(3.53)
Politics-Related Previous Job						-5.02*			-5.17*
						(2.80)			(2.78)
Born Outside of the UK							4.18		-1.87
							(7.26)		(8.58)
Born Outside of England								3.76	4.15
								(3.68)	(3.90)
Observations	59,092	58,739	55,703	58,377	58,448	56,156	47,095	47,095	59,092
Number of MPs	597	589	529	571	570	565	463	463	597
Lottery FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Party FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

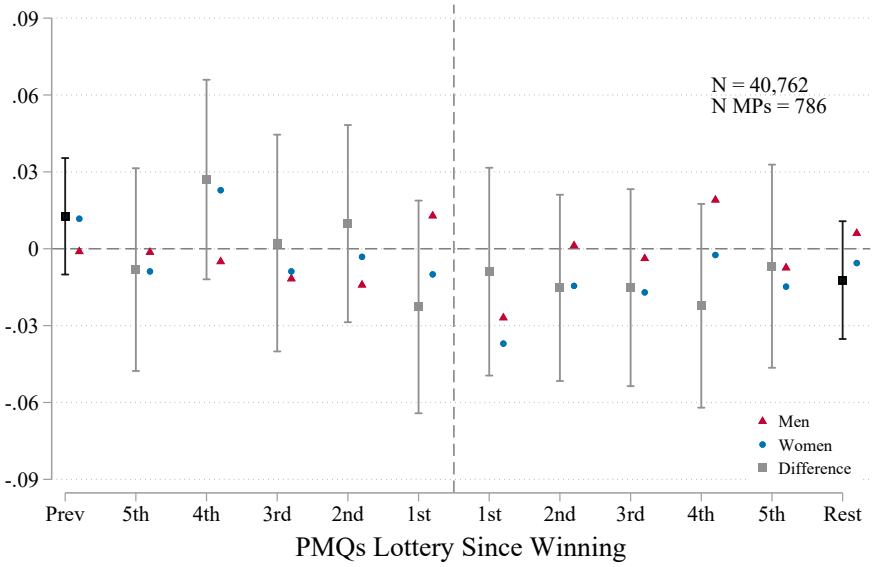
Notes: The unit of observation is MP-lottery (i.e. the stacked specification), with 157 lotteries from 2015 to 2020 (the pre-hybrid era). The sample includes male MPs eligible to enter each lottery (those without a government position). Entered is a variable equal to 100 if the MP entered the PMQs lottery and zero otherwise. Coefficients can then be interpreted as percentage point effects. All control variables shown are dummy variables, with the exception of Age, which is in years. To avoid losing observations due to missinginess, column 9 additionally includes dummy variables for each control being missing, and each control is set to -99 when missing. Standard errors are clustered at the MP-level throughout. *** p<0.01, ** p<0.05, * p<0.1.

Figure A8: Gender Gap Versus Female Representation in Parliament



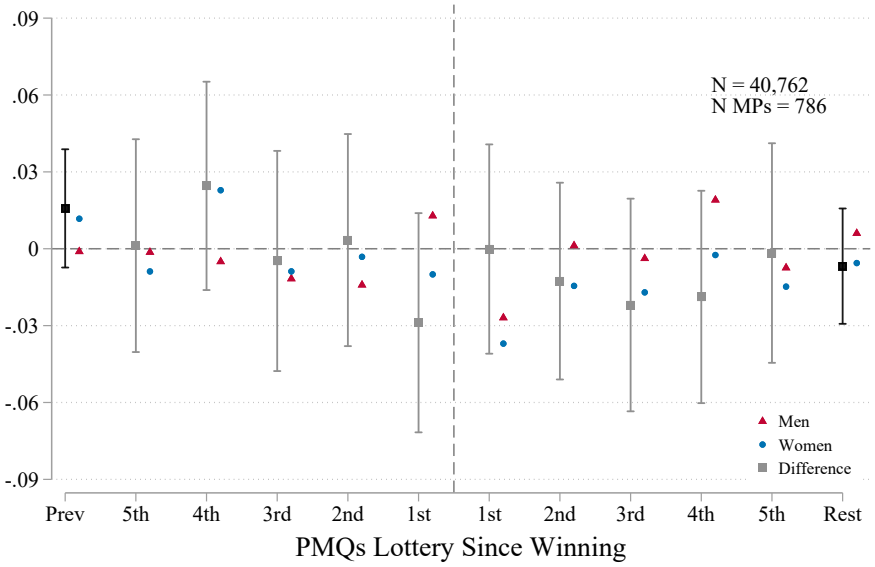
Notes: The figure plots the term-level (nine terms from 1990-92 to 2019-21) PMQs gender gap and 95% confidence intervals against the average female percentage of sitting MPs during that term. The 2019-21 term keeps only pre-hybrid lotteries. The last three terms use the specification in column 2 of Table 2, while the earlier terms use that of Figure 1 (and these earlier terms have less precision given that we only observe lottery winners rather than entrants). The linear fit referenced in the figure comes from an $N = 9$ weighted OLS regression of the estimated gender gap (point estimate) on the female percentage of MPs, with the inverse of the squared standard error as weights, and robust standard errors.

Figure A9: Gender Heterogeneity in the Effect of Lottery Wins



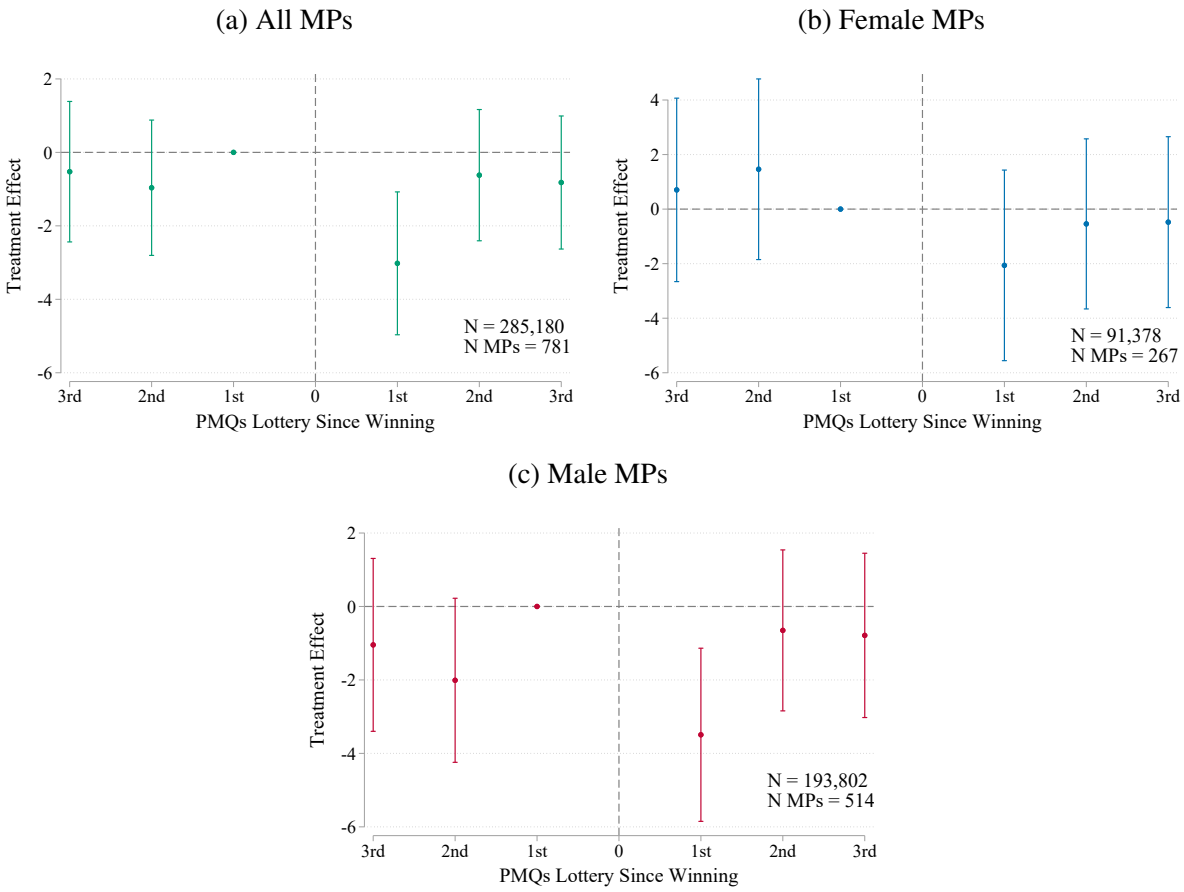
Notes: The figure plots the gender difference in the effect of winning on previous and subsequent entries, i.e. the coefficient on the interaction between female and treatment dummies in the stacked specification. The point estimates from the stacked specification run separately for women and men (identical to those in Figure 3) are plotted in blue and red.

Figure A10: Gender Heterogeneity in the Effect of Lottery Wins, Conditional on Cohort and Party



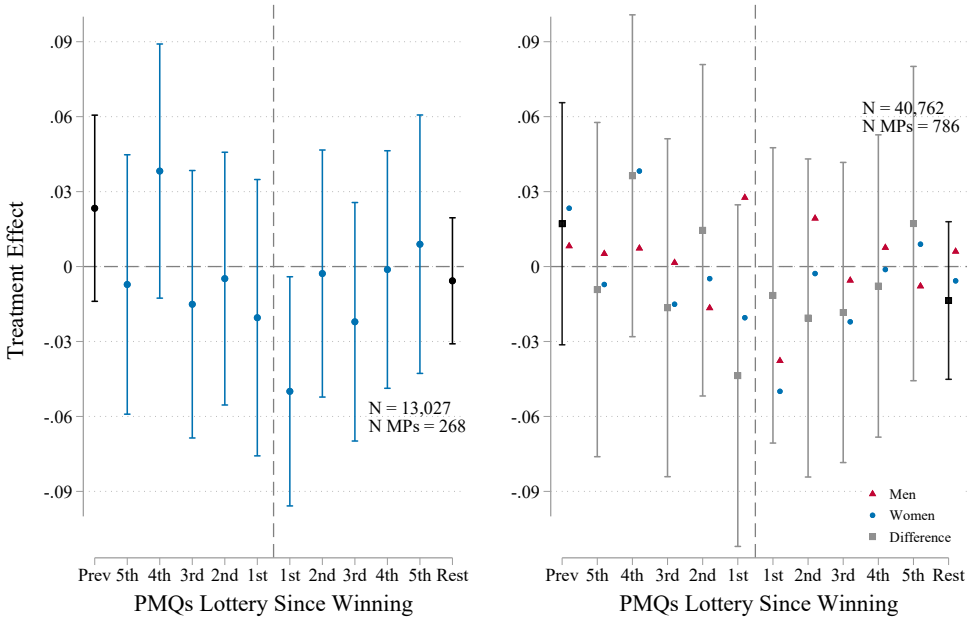
Notes: The figure plots the gender difference in the effect of winning on previous and subsequent entries (i.e. the coefficient on the interaction between female and treatment dummies in the stacked specification), conditional on cohort and political party (i.e. the regression includes the full set of interactions between winning and cohort dummies, and between winning and party dummies). The point estimates from the stacked specification run separately for women and men (identical to those in Figure 3) are plotted in blue and red.

Figure A11: Effects of Question-Asking On Future Question-Asking: Stacked Panel Robustness



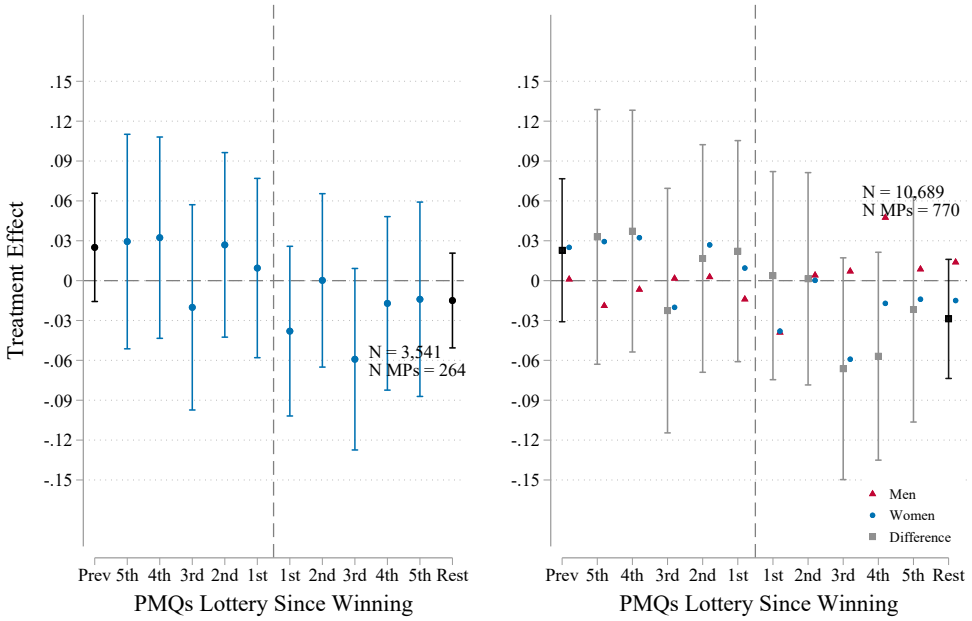
Notes: The figure shows the effects of winning the PMQs lottery on entry into future PMQs lotteries. The balanced panel sample includes entrants to lotteries from 2015 to 2020. The estimates derive from a stacked panel specification, with MP-by-lottery and relative week-by-lottery fixed effects, and interactions between winning and relative week. Standard errors are clustered at the MP-level, and 95% confidence intervals are shown.

Figure A12: Gender Heterogeneity in the Effect of Lottery Wins After Reweighting



Notes: The left-hand-side panel plots the effects of PMQs' lottery wins for female MPs, with reweighting by the inverse probability of prior lottery entry that session. The right-hand-side panel plots the difference in the effect between female and male winners, with the same reweighting.

Figure A13: The Effect of Lottery Wins for Not-Yet Winners



Notes: The left-hand-side panel plots the effects of PMQs' lottery wins for female MPs that had not won the lottery since the 2015/16 session began. The right-hand-side panel plots the difference in the effect between female first-time winners and male first-time winners.

Table A8: The Gender Gap in Question-Asking Does Not Close With Parliamentary Experience

	Entered (1)	Entered (2)	Entered (3)
Female × Years of Experience	-0.03	-1.05	-2.42
	(0.86)	(1.47)	(2.51)
Observations	87,129	34,698	19,757
Sample	All	Exper≤5	Exper≤2
Number of MPs	882	434	422
Outcome Mean	49.3	63.9	63.6
Lottery FE	Yes	Yes	Yes
MP FE	Yes	Yes	Yes

Notes: Stacked specification where the unit of observation is MP-lottery, including the 157 lotteries from 2015 to 2020 (the pre-hybrid era). The sample includes only those MPs eligible to enter each lottery (those without a government position). Column 2 includes only those with Years of Experience less than or equal to five years. Column 3 includes those with experience less than or equal to two years. Entered is a variable equal to 100 if the MP entered the PMQs lottery and zero otherwise. Coefficients can then be interpreted as percentage point effects. Years of Experience is the number of years since the MP was first elected to the House of Commons (until the date of the PMQs lottery). Note that there is no Female dummy, as it is fully collinear with the MP fixed effects, and similarly there is no Years of Experience level variable, as it is fully collinear with the lottery fixed effects (which are equivalent to date fixed effects) after absorbing the MP fixed effects. Standard errors are clustered at the MP-level throughout. *** p<0.01, ** p<0.05, * p<0.1.

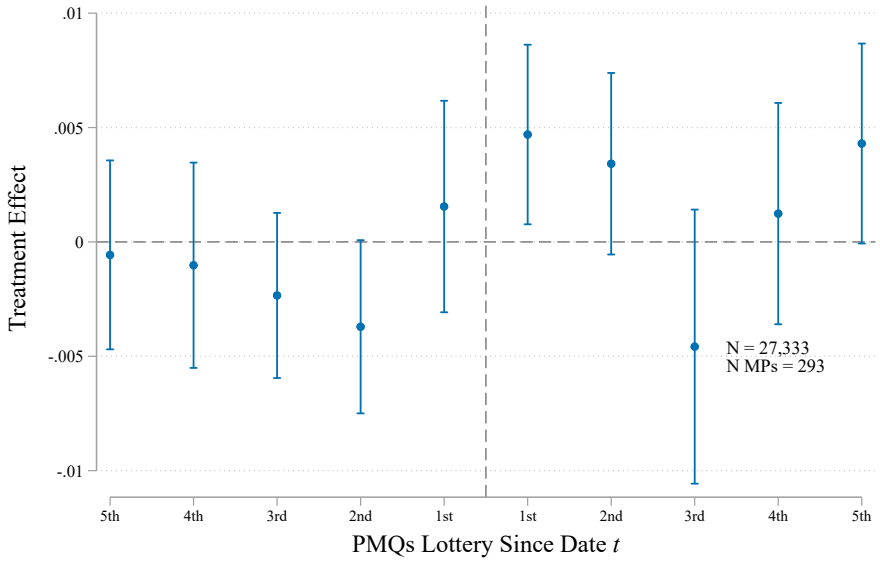
Table A9: The Gender Gap in Question-Asking Does Not Close With Accumulated PMQs Experience

	Entered		
	(1)	(2)	(3)
Female × No. of Wins Since 1990/91	0.50	0.53	-1.41
	(0.63)	(0.81)	(1.46)
Observations	87,129	34,698	19,757
Sample	All	Exper≤5	Exper≤2
Number of MPs	882	434	422
Outcome Mean	49.3	63.9	63.6
No. of Wins Since 1990/91 Control	Yes	Yes	Yes
Lottery FE	Yes	Yes	Yes
MP FE	Yes	Yes	Yes

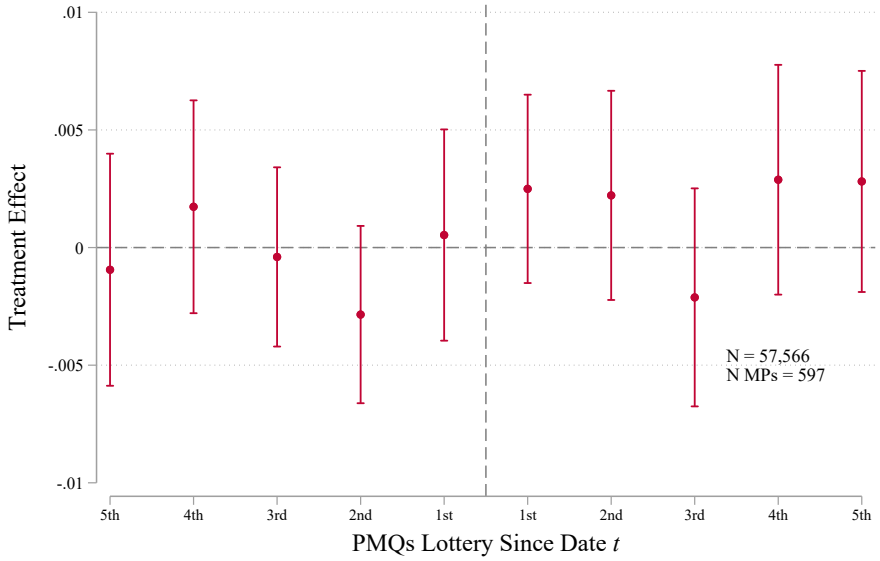
Notes: Stacked specification where the unit of observation is MP-lottery, including the 157 lotteries from 2015 to 2020 (the pre-hybrid era). The sample includes only those MPs eligible to enter each lottery (those without a government position). Column 2 includes only those with Years of Experience less than or equal to five years. Column 3 includes those with experience less than or equal to two years. Entered is a variable equal to 100 if the MP entered the PMQs lottery and zero otherwise. Coefficients can then be interpreted as percentage point effects. Years of Experience is the number of years since the MP was first elected to the House of Commons (until the date of the PMQs lottery). Note that there is no Female dummy, as it is fully collinear with the MP fixed effects. Standard errors are clustered at the MP-level throughout. *** p<0.01, ** p<0.05, * p<0.1.

Figure A14: Effects of Questions From Women on the Entry of Others

(a) Female MPs

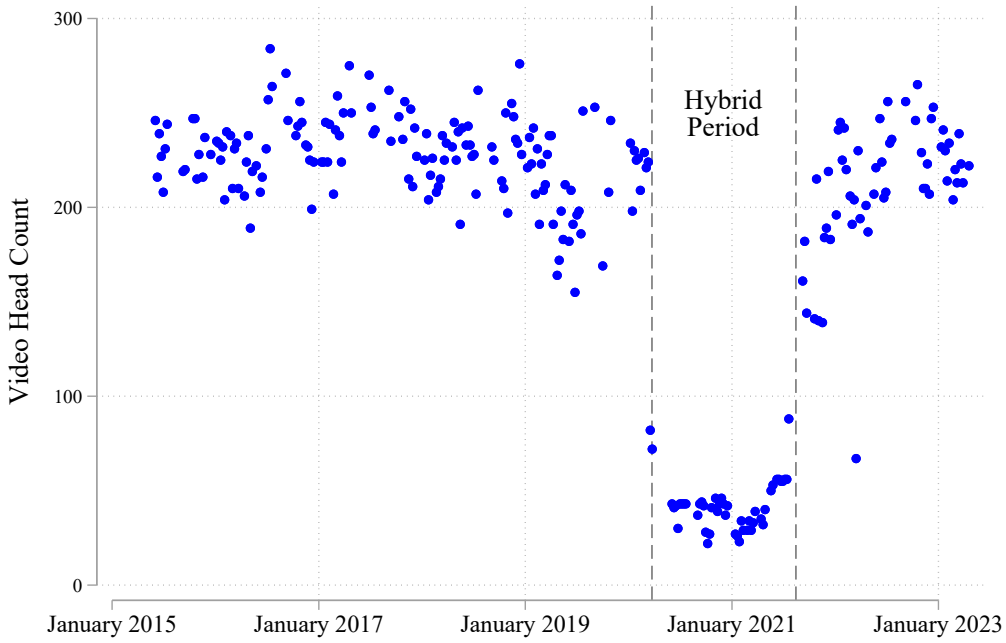


(b) Male MPs



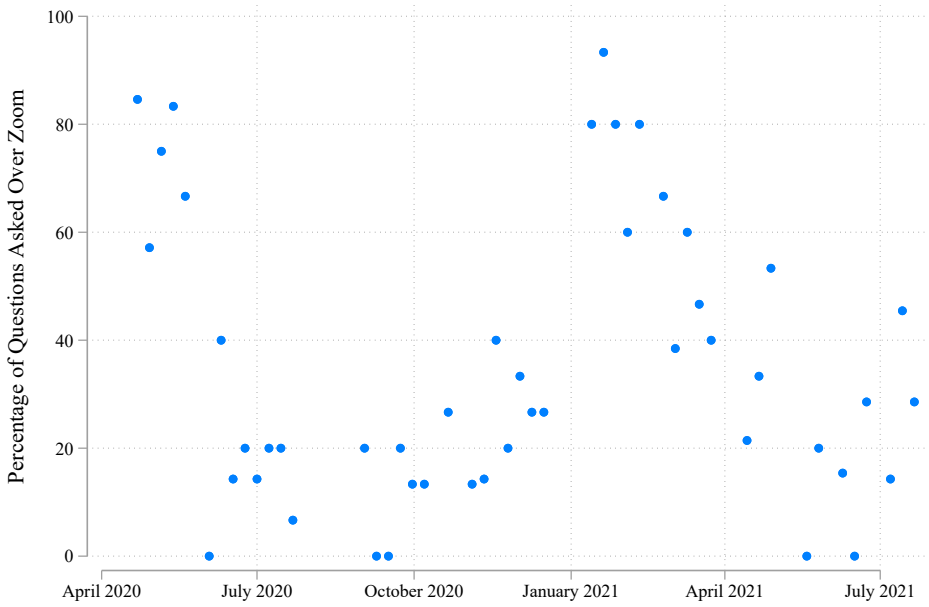
Notes: The figure plots the causal effect of an additional female (other than MP *i*) winning for female and male MPs separately, using stacked specification 3. Each marker is from a separate regression. The markers to the right of the dashed line show the effect on entering the next five lotteries. The markers to the left denote balance checks, showing that an additional female winner in the current lottery does not predict decisions to enter the previous five lotteries. The observation numbers in the bottom-right refer to the effect on the 1st lottery since date t. The sample includes all time t lottery-eligible MPs, for the 156 PMQs lotteries from 2015 to 2020. 95% confidence intervals are shown.

Figure A15: PMQs Attendance Over Time



Notes: The figure plots the estimated number of people physically present in the House of Commons for Prime Minister's Questions across time. The estimates are made by observing YouTube videos of each PMQs, pausing the video at the point that the camera shows the full room.

Figure A16: Virtual Question Share Over Time



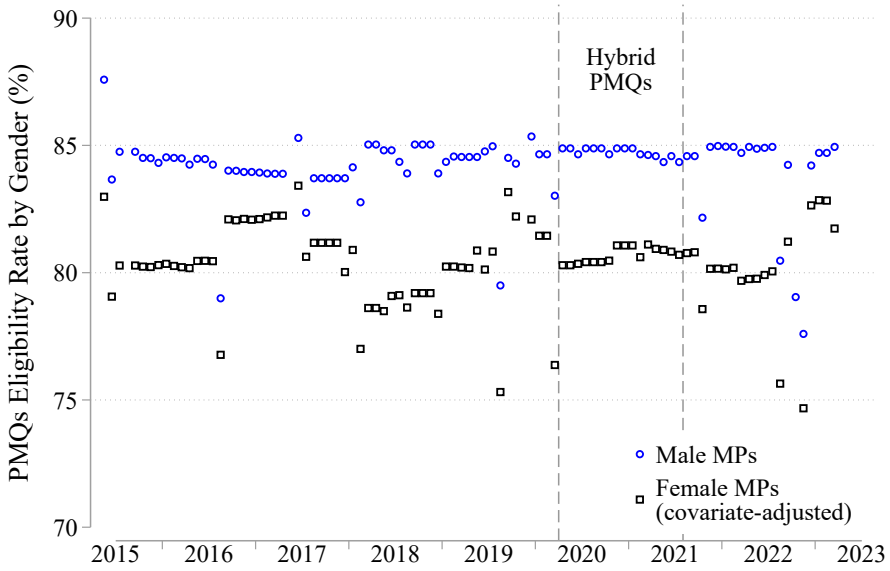
Notes: The figure plots the percentage of PMQs lottery-selected questions that were asked over Zoom (as opposed to in-person) during the period of hybrid proceedings.

Table A10: Lottery Entry Is Higher During the Hybrid Era

	Entered			
	(1)	(2)	(3)	(4)
Hybrid Period	10.70***	4.73***	4.51***	4.24***
	(1.36)	(1.38)	(1.38)	(1.29)
Post-Hybrid Period	1.66	-4.29***	-4.52***	-4.34***
	(1.36)	(1.37)	(1.37)	(1.30)
Observations	146,205	146,205	146,205	146,199
Number of MPs	909	909	909	903
Pre-Hybrid Outcome Mean	49.3	49.3	49.3	49.3
Cohort FE	No	Yes	Yes	Yes
Party FE	No	No	Yes	Yes
MP FE	No	No	No	Yes
p(Hybrid Period = Post-Hybrid Period)	<0.001	<0.001	<0.001	<0.001

Notes: The unit of observation is MP-lottery, including 264 lotteries from 2015 to 2023. The sample includes only those MPs eligible to enter each lottery (those without a government position). Entered is a variable equal to 100 if the MP entered the PMQs lottery and zero otherwise. Coefficients can then be interpreted as percentage point effects. Hybrid and Post-Hybrid Period are dummy variables indicating lotteries held during the hybrid and post-hybrid eras. Standard errors are clustered at the MP-level throughout. *** p<0.01, ** p<0.05, * p<0.1.

Figure A17: PMQs Eligibility by Gender and Month



Notes: The figure shows the fraction of male MPs that are eligible for PMQs each month, and the equivalent covariate-adjusted fraction for female MPs: from adding on the female coefficient from a regression with cohort and political party fixed effects (in line with our preferred specification, column 2 of Table 2). Female MPs have lower eligibility rates as they are more likely to hold government positions.

Table A11: The Closing Of The Gender Gap Is Not Due To Health Questions Becoming More Important

	Entered		
	(1)	(2)	(3)
Female	-5.96***		
	(2.27)		
Female × Hybrid	4.30	4.54*	5.21*
	(2.67)	(2.76)	(2.88)
Female × Post-Hybrid	5.12*	5.42*	5.62*
	(2.78)	(2.86)	(2.93)
Female × Health Topic Share	23.83	33.85	21.46
	(36.39)	(35.58)	(39.29)
Observations	142,887	142,881	135,209
Male Outcome Mean	51.4	51.4	51.6
Lottery FE	Yes	Yes	Yes
Cohort-Period FE	Yes	Yes	Yes
Party-Period FE	Yes	Yes	Yes
MP FE	No	Yes	Yes
MP-Calendar Week FE	No	No	Yes
p(Pre-Hybrid Gap = Hybrid and After Gap)	0.06	0.05	0.04

Notes: The unit of observation is MP-lottery, including 258 lotteries from 2015 to 2023 (we lose 6 lotteries due to missing transcripts, with these transcripts required for the Health Topic Share variable). The sample includes only those MPs eligible to enter each lottery (those without a government position). Entered is a variable equal to 100 if the MP entered the PMQs lottery and zero otherwise. Coefficients can then be interpreted as percentage point effects. Health Topic Share is the week-level share of health-related words in exchanges between male lottery winners and the Prime Minister. Cohort-Period FE are cohort fixed effects fully interacted with dummy variables for the pre-hybrid, hybrid, and post-hybrid periods (similar for Party-Period FE). The p-value in the bottom row reflects a test of the null hypothesis that the gender gap pre-hybrid is equal to the one from the hybrid period onwards. This comes from a separate regression in which Female × Hybrid and Female × Post-Hybrid are replaced with Female × Hybrid and After. Standard errors are clustered at the MP-level throughout. *** p<0.01, ** p<0.05, * p<0.1.

Table A12: The Closing Of The Gender Gap Is Not Due To COVID-19-Related Questions Becoming More Important

	Entered		
	(1)	(2)	(3)
Female	-5.80***		
	(2.24)		
Female × Hybrid	4.51*	4.61*	5.04*
	(2.66)	(2.76)	(2.89)
Female × Post-Hybrid	5.23*	5.49*	5.60*
	(2.80)	(2.88)	(2.93)
Female × COVID-19 Topic Share	-35.26	14.52	72.82
	(154.52)	(152.43)	(180.14)
Observations	142,887	142,881	135,209
Male Outcome Mean	51.4	51.4	51.6
Lottery FE	Yes	Yes	Yes
Cohort-Period FE	Yes	Yes	Yes
Party-Period FE	Yes	Yes	Yes
MP FE	No	Yes	Yes
MP-Calendar Week FE	No	No	Yes
p(Pre-Hybrid Gap = Hybrid and After Gap)	0.04	0.04	0.04

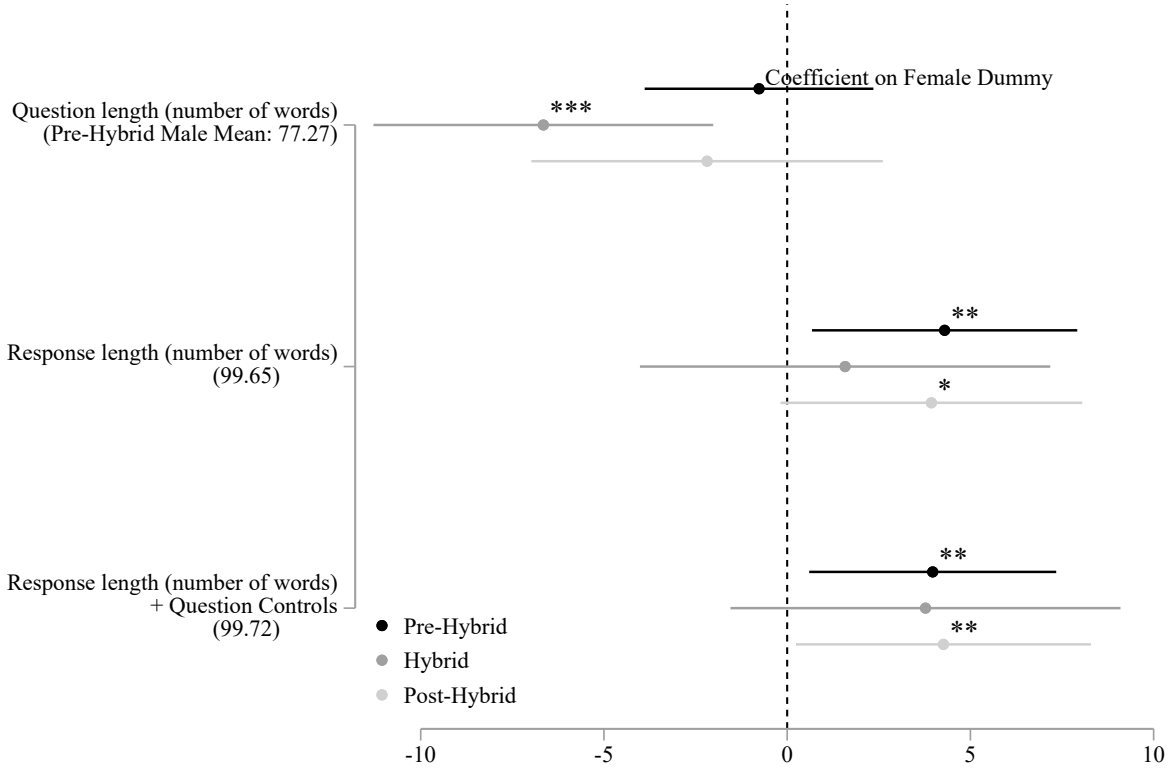
Notes: The unit of observation is MP-lottery, including 258 lotteries from 2015 to 2023 (we lose 6 lotteries due to missing transcripts, with these transcripts required for the COVID-19 Topic Share variable). The sample includes only those MPs eligible to enter each lottery (those without a government position). Entered is a variable equal to 100 if the MP entered the PMQs lottery and zero otherwise. Coefficients can then be interpreted as percentage point effects. COVID-19 Topic Share is the week-level share of COVID-19-related words in exchanges between male lottery winners and the Prime Minister. Cohort-Period FE are cohort fixed effects fully interacted with dummy variables for the pre-hybrid, hybrid, and post-hybrid periods (similar for Party-Period FE). The p-value in the bottom row reflects a test of the null hypothesis that the gender gap pre-hybrid is equal to the one from the hybrid period onwards. This comes from a separate regression in which Female × Hybrid and Female × Post-Hybrid are replaced with Female × Hybrid and After. Standard errors are clustered at the MP-level throughout. *** p<0.01, ** p<0.05, * p<0.1.

Table A13: COVID-19-Related Topics During PMQs Do Not Predict Entry

	Entered		
	(1)	(2)	(3)
COVID-19 Topic Share	-0.33	-0.24	-0.50
	(0.61)	(0.94)	(1.07)
Exchange	PM-vs-Opp	PM-vs-MP	All
Observations	111	111	111
Outcome Mean	55	55	55
Month-Period FE	Yes	Yes	Yes

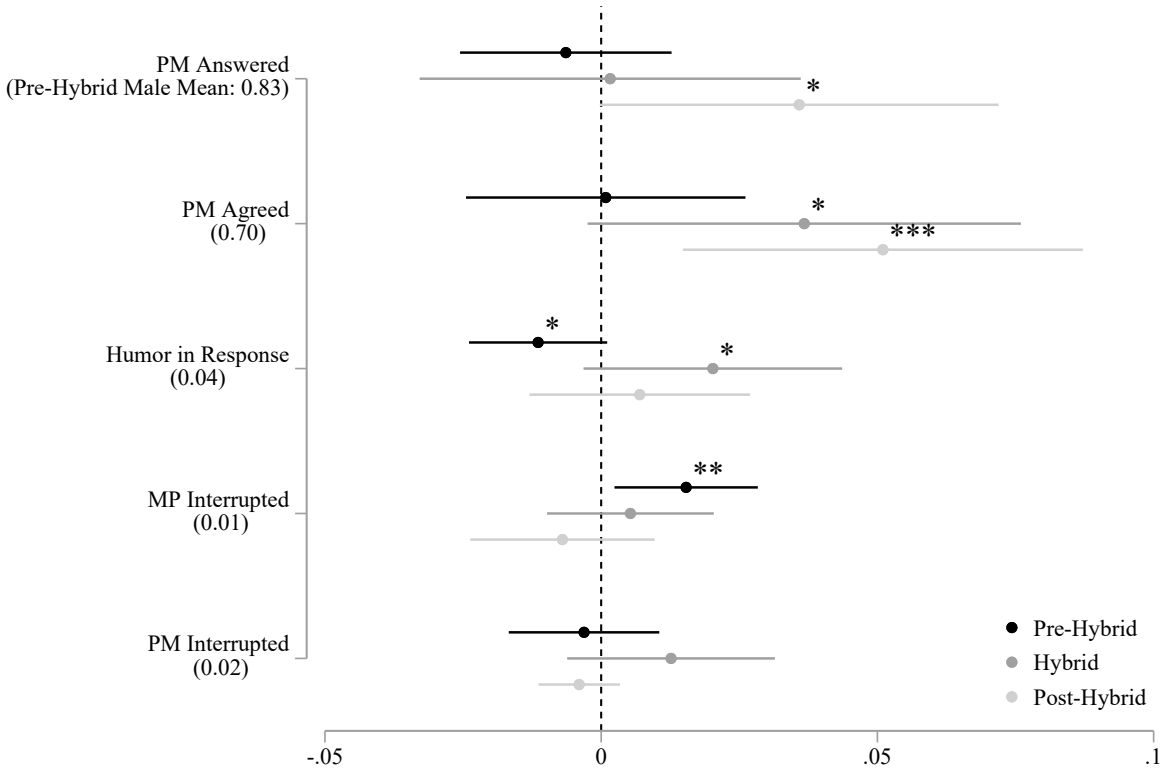
Notes: The unit of observation is at the lottery level. We include all lotteries from the first week when COVID-19 was mentioned during the PMQs to the last week when COVID-19 was mentioned. Entered is the percentage of MPs that entered the PMQs lottery, calculated using only those MPs eligible to enter each lottery (those without a government position). COVID-19 Topic Share is the standardized week-level share of COVID-19-related words in exchanges. The row Exchange indicates how COVID-19 Topic Share is calculated: using exchanges between the PM and the leader of the opposition, between the PM and the MPs who won the lottery that week, or all exchanges. Month-Period FE are month fixed effects fully interacted with dummy variables for the pre-hybrid, hybrid, and post-hybrid periods. Robust standard errors are reported throughout. *** p<0.01, ** p<0.05, * p<0.1.

Figure A18: Gender Differences in Question and Response Length



Notes: The figure shows the coefficient on the female indicator variable from specification 4, for three different periods: pre-hybrid PMQs (2,236 exchanges), hybrid PMQs (677 exchanges), and post-hybrid PMQs (740 exchanges). In each regression, we include cohort, week, and coder fixed effects, and party fixed effects for the party of the MP asking the question. For the "+ Question Controls" regressions, we additionally control for question characteristics: Question Length, as well as the following indicator variables: Constituency Issue, Humor in Question, Request, Issue Update, Prompt for Comment, Agreement, Self-Promotion/Narrow Factual, and Concede-accept/condemnatory. 95% confidence intervals are shown. *** p<0.01, ** p<0.05, * p<0.1.

Figure A19: Gender Differences in Responses Controlling for Question Characteristics



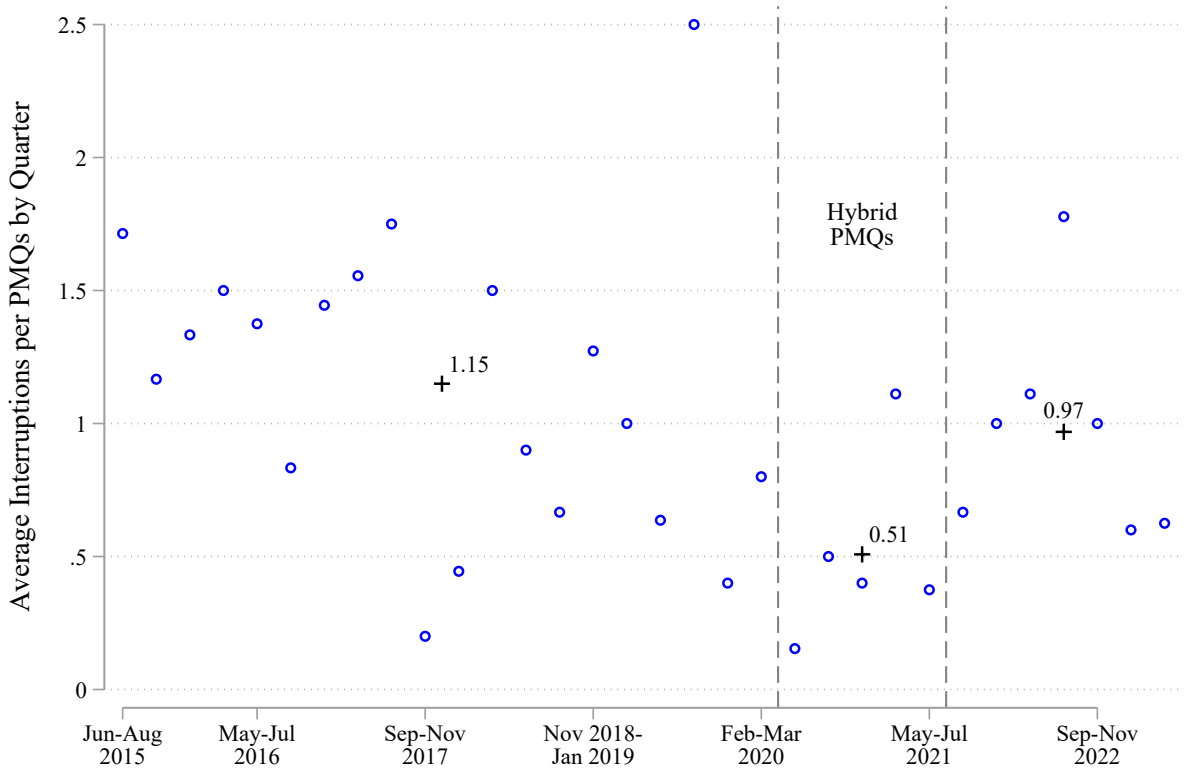
Notes: The figure shows the coefficient on the female indicator variable from specification 4, for three different periods: pre-hybrid PMQs (2,236 exchanges), hybrid PMQs (677 exchanges), and post-hybrid PMQs (740 exchanges). In each regression, we include cohort, week, and coder fixed effects, and party fixed effects for the party of the MP asking the question. In addition, we control for question characteristics: Question Length, and the following indicator variables: Constituency Issue, Humor in Question, Request, Issue Update, Prompt for Comment, Agreement, Self-Promotion/Narrow Factual, and Concede-accept/condemnatory. 95% confidence intervals are shown. *** p<0.01, ** p<0.05, * p<0.1.

Table A14: Female Questioners Face More Negative Disruptions

	Disruption	
	(1)	(2)
Female	1.89**	1.88**
	(0.91)	(0.91)
Observations	2,141	2,141
Male Outcome Mean	2.84	2.84
Date FE	Yes	Yes
Cohort FE	Yes	Yes
Party FE	Yes	Yes
Margin and Posts	No	Yes

Notes: The unit of observation is MP-date, using stacked specification 2. The sample covers questions from the lottery winners for the 149 PMQs from 2015 to 2020 (the pre-hybrid era) with available YouTube videos. Disruption is equal to 100 if the MP's question was negatively disrupted, and zero otherwise, as coded manually from watching YouTube videos of PMQs. Coefficients can then be interpreted as percentage point effects. Margin and Posts denote controls for the MP's vote margin at their last election, and dummy variables for holding an opposition post (e.g. shadow minister) or a parliamentary post (e.g. vice-chair of the MP's party). Standard errors are clustered at the MP-level. *** p<0.01, ** p<0.05, * p<0.1.

Figure A20: Rowdy Exchanges Were Less Common During the Hybrid Era



Notes: The figure shows the average number of interrupted exchanges per PMQs (recorded in parliamentary transcripts, used elsewhere as the exchange-level variable *Rowdy Exchange*) against time. The blue circles denote the averages by quarter. The black crosses denote the averages for the three key periods: pre-hybrid, hybrid, and post-hybrid.

Table A15: Attendance, Gender Composition, and Adversarial Atmosphere

	MP Interrupted Share			Rowdy Exchange Share		
	(1)	(2)	(3)	(4)	(5)	(6)
Attendance (z-score)	0.005**	0.005**	0.003	0.007	0.008	0.009
	(0.002)	(0.002)	(0.003)	(0.005)	(0.005)	(0.006)
Female Share (z-score)	-0.001	-0.001	0.000	-0.008	-0.007	-0.003
	(0.002)	(0.003)	(0.004)	(0.005)	(0.005)	(0.008)
Observations	209	209	209	209	209	209
Outcome Mean	0.018	0.018	0.018	0.078	0.078	0.078
Month FE	No	Yes	No	No	Yes	No
Quarter-Specific Linear Time Trend	No	No	Yes	No	No	Yes

Notes: The unit of observation is the PMQs date. The sample includes all lotteries in the pre- and post-hybrid period. MP Interrupted is the share of PMQs questions that were severely interrupted, requiring the Speaker to intervene. Rowdy Exchange Share is the share of PMQs question-answer exchanges that faced any interruption. Attendance (z-score) is the standardized total number of MPs in attendance (SD = 28.83). Female Share (z-score) is the standardized share of attending MPs that are female (SD = 0.06). Quarter-Specific Linear Time Trend is a set of quarter dummies fully interacted with the PMQs date to allow for differential linear time trends by quarter. Robust standard errors are reported throughout. *** p<0.01, ** p<0.05, * p<0.1.

Table A16: Female MPs Are No More Likely to Contribute to Rowdiness Than Male MPs

	Talking, Laughing, or Shouting (1)	Shouting (2)
Female	-0.013	0.016
	(0.040)	(0.014)
Observations	593	593
Male Outcome Mean	0.377	0.013
Lottery FE	Yes	Yes

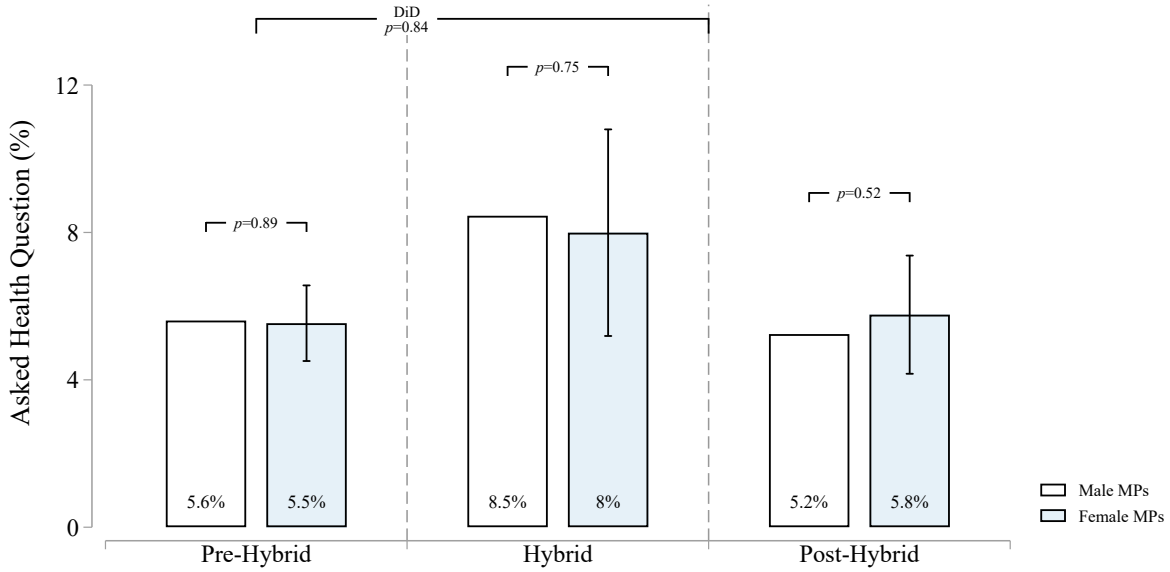
Notes: The sample consists of MPs from 25 randomly selected PMQs in the pre-hybrid period. Information on the MPs are recorded visually from a YouTube clip of the PMQs livestream in which the chamber is rowdy. Talking, Laughing, or Shouting is an indicator variable equal to one if the MP is visibly talking, laughing, or shouting during the clip, and zero otherwise. Shouting is an indicator variable equal to one if the MP is visibly shouting during the clip, and zero otherwise. Standard errors are robust. *** p<0.01, ** p<0.05, * p<0.1.

Table A17: Female Questioners Are Not Detectably Further From Microphones

	Microphone Visible	
	(1)	(2)
Female	-0.09	-0.06
	(0.10)	(0.11)
Observations	138	133
Male Mean	0.67	0.66
Party FE	No	Yes
Cohort FE	No	Yes

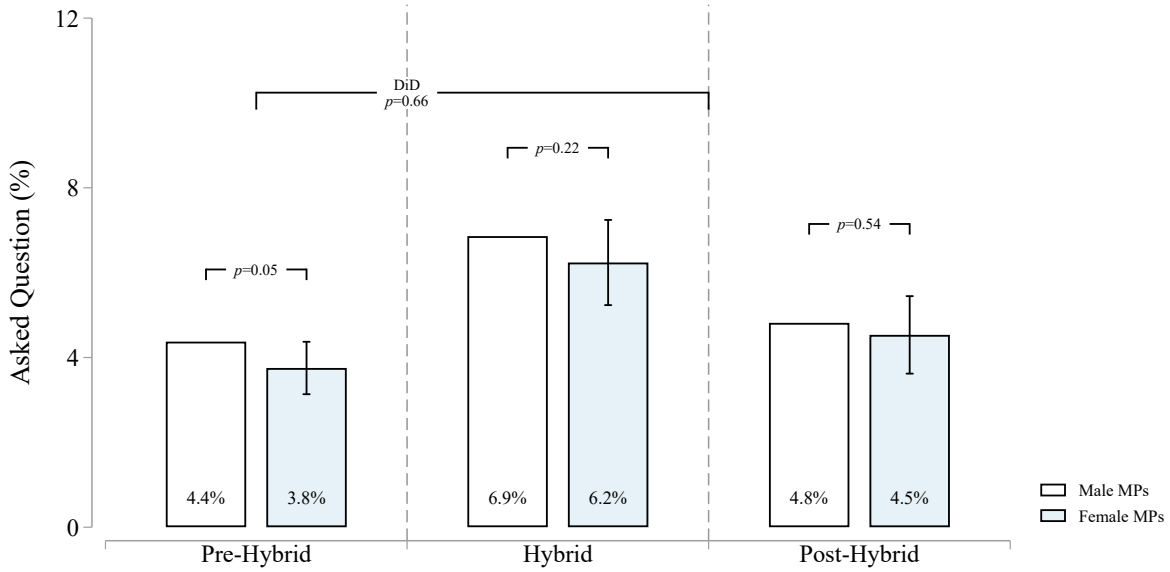
Notes: The sample includes the PMQs lottery winners that went on to actually ask a question, from 10 randomly selected lotteries from the pre-hybrid period. The unit of observation is at the MP-lottery level. Microphone Visible is a dummy variable equal to one if a microphone head is visible in the YouTube screenshot of the MP asking their question, zero otherwise. Standard errors are clustered at the MP-level. *** p<0.01, ** p<0.05, * p<0.1.

Figure A21: The Gender Gap in Questions to the Health Secretary Was Not Affected



Notes: For questions to the Prime Minister we have data on the names of all MPs that submitted a question; for questions to the other ministers, we only have data on those randomly selected to ask a question (from among those that submitted). The white bars show the raw percentage of eligible male MPs that asked an oral question to the Health Secretary during three periods: before hybrid proceedings (June 2015 to March 2020), during hybrid (April 2020 to July 2021), and after the return to the in-person-only format (September 2021 to April 2023). The blue bars show the percentage for eligible women, derived from our preferred specification with lottery, cohort, and political party fixed effects (following column 2 of Table 2). Three p-values reflect tests of the null hypothesis that the gender gap in entry in a given period is zero, while the DiD p-value reflects a test of the null hypothesis that the gender gap pre-hybrid is equal to the one from the hybrid periods onwards.

Figure A22: The Gender Gap in Questions to Other Ministers Was Not Affected



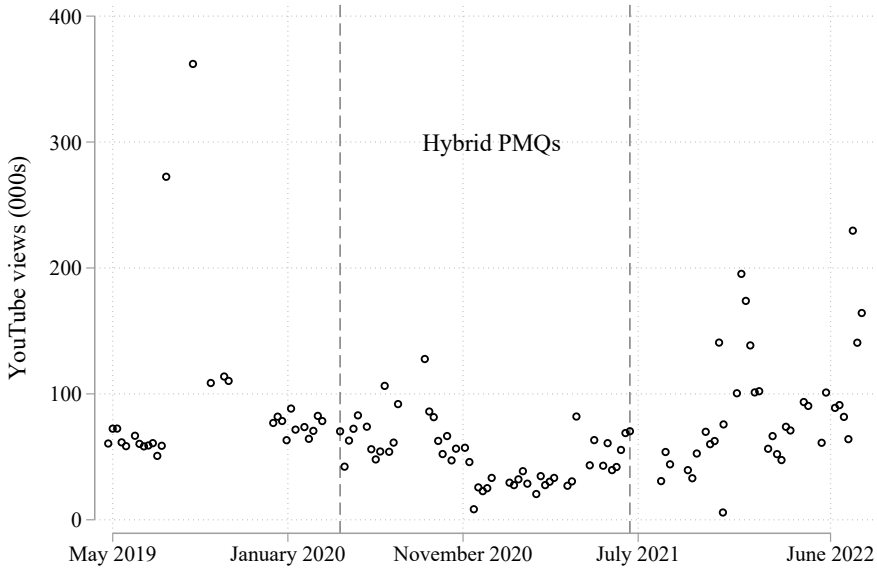
Notes: For questions to the Prime Minister we have data on the names of all MPs that submitted a question; for questions to the other ministers, we only have data on those randomly selected to ask a question (from among those that submitted). The white bars show the raw percentage of eligible male MPs that asked an oral question to other ministers (excluding Health) during three periods: before hybrid proceedings (June 2015 to March 2020), during hybrid (April 2020 to July 2021), and after the return to the in-person-only format (September 2021 to April 2023). The blue bars show the percentage for eligible women, derived from our preferred specification with lottery, cohort, and political party fixed effects (following column 2 of Table 2). Three p-values reflect tests of the null hypothesis that the gender gap in entry in a given period is zero, while the DiD p-value reflects a test of the null hypothesis that the gender gap pre-hybrid is equal to the one from the hybrid periods onwards.

Table A18: Are Female MPs More Likely to Ask Questions Remotely?

	Asked Remotely			
	(1)	(2)	(3)	(4)
Female	5.37	4.79	4.66	4.15
	(3.99)	(4.07)	(4.10)	(4.41)
Previous Vote Margin (%)			0.03	-0.02
			(0.13)	(0.13)
Holds Oppostion Post			-5.02	-2.14
			(7.98)	(8.20)
Holds Parliamentary Post			10.54	10.31
			(12.99)	(14.44)
Age (Years)				0.49**
				(0.21)
Elections Lost				0.21
				(2.10)
Black, Asian or Minority Ethnic				-1.13
				(7.01)
State-Schooled				-4.12
				(4.83)
University Degree				-3.64
				(5.72)
Attended Oxbridge				-0.89
				(4.62)
Politics-Related Previous Job				1.77
				(4.25)
Born Outside of the UK				4.63
				(11.57)
Born Outside of England				-1.45
				(5.96)
Observations	676	676	676	676
Number of MPs	341	341	341	341
Male Outcome Mean	32.7	32.7	32.7	32.7
Lottery FE	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes
Party FE	No	Yes	Yes	Yes

Notes: The sample includes PMQs lottery winners during the hybrid era, and the unit of observation is MP-lottery. Asked Remotely is a variable equal to 100 if the MP chose to ask their question over Zoom, rather than in-person. Coefficients can then be interpreted as percentage point effects. Previous Vote Margin and Posts controls denote the MP's vote margin at their last election, and dummy variables for holding an opposition post (e.g. shadow minister) or a parliamentary post (e.g. vice-chair of the MP's party). Additional Controls include age, number of parliamentary elections lost prior to first joining the House of Commons, dummy for Black and minority ethnic, dummy for attended state school, dummy for attended university, dummy for studied at Oxford or Cambridge university, dummy for politics-adjacent job prior to entering the House of Commons, dummy for born abroad, and dummy for born outside England, along with dummies for missing (not shown), as these variables are missing for some of the MPs in our sample. Standard errors are clustered at the MP-level throughout. *** p<0.01, ** p<0.05, * p<0.1.

Figure A23: The Hybrid Format Change Does Not Affect YouTube Viewership



Notes: This figure shows the total YouTube views that each PMQs received on the video posted to the official UK Parliament YouTube channel as of July 15, 2025.

Table A19: Gender Differences in Reactions to PMQs Posts on Twitter

	Twitter Profile (1)	Posted on Twitter (2)	Number of Likes (3)	Number of Reposts (4)	Number of Replies (5)
			Panel A: Pre-Hybrid Period		
Female	0.04	0.11*	24.85	0.05	2.44
	(0.03)	(0.06)	(20.92)	(10.25)	(2.62)
			Panel B: Hybrid Period		
Female	-0.11	-0.05	85.09***	31.46***	9.37***
	(0.07)	(0.07)	(28.78)	(10.86)	(3.45)
			Panel C: Post-Hybrid Period		
Female	-0.11*	0.00	-75.55	-28.60	-5.52
	(0.06)	(0.07)	(57.76)	(19.95)	(4.53)
Full Sample Observations	1,124	959	607	607	607
Full Sample Outcome Mean	.85	.63	114	47	13
Lottery FE	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes
Party FE	Yes	Yes	Yes	Yes	Yes

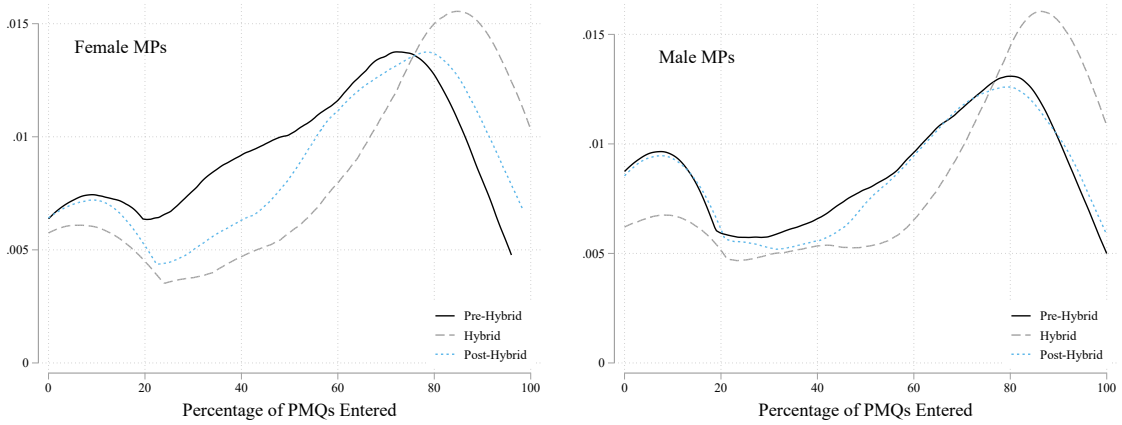
Notes: The sample includes the PMQs lottery winners from 75 randomly selected lotteries: 25 during the pre-hybrid period, 25 during the hybrid period, and 25 during the post-hybrid period. We collect information on each MP's engagement on Twitter about the PMQs they participated in. The outcome variables are: (1) whether an MP had a Twitter profile as of the lottery, (2) whether the MP posted about the PMQs on Twitter conditional on having a profile, (3) number of likes of the post, (4) number of reposts of the post, and (5) number of replies to the post. Outcome in column 2 is set to missing if the MP did not have a Twitter profile as of the lottery date. Outcomes in columns 3 to 5 are set to missing if the MP did not make a post about their question. Further, they are also winsorized at the 95th percentile to reduce the influence of outliers. *** p<0.01, ** p<0.05, * p<0.1.

Table A20: The Gender Gap Remains Closed During 2023 to 2025

	Entered and Won		
	(1)	(2)	(3)
Female	-0.05	-0.02	-0.04
	(0.20)	(0.20)	(0.20)
Observations	42,255	42,255	42,255
Male Outcome Mean	2.54	2.54	2.54
Lottery FE	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes
Party FE	No	Yes	Yes
Margin and Posts	No	No	Yes

Notes: The unit of observation is MP-lottery (i.e. the stacked specification), with 76 lotteries from April 2023 to July 2025. The sample includes only those MPs eligible to enter each lottery (those without a government position). The outcome variable is equal to 100 if the MP won the PMQs lottery and zero otherwise (for this time period we do not have data on which MPs entered the lottery, we only know which MPs won, as these MPs are listed on publicly available Order Papers). Coefficients can then be interpreted as percentage point effects. Margin and Posts denote controls for the MP's vote margin at their last election, and dummy variables for holding an opposition post (e.g. shadow minister) or a parliamentary post (e.g. vice-chair of the MP's party). Standard errors are clustered at the MP-level throughout. *** p<0.01, ** p<0.05, * p<0.1.

Figure A24: Women Continue to Ask More Often After Hybrid Ends, Men Do Not



Notes: The figure plots kernel densities of the PMQs entry rate separately for men and women, and separately for the pre-hybrid, hybrid, and post-hybrid periods. For a given MP and period, the entry rate is calculated as the percentage of PMQs lotteries entered, only among the lotteries for which they were eligible to enter. We keep only the MP-period observations for which an MP was eligible to enter at least 20 lotteries.

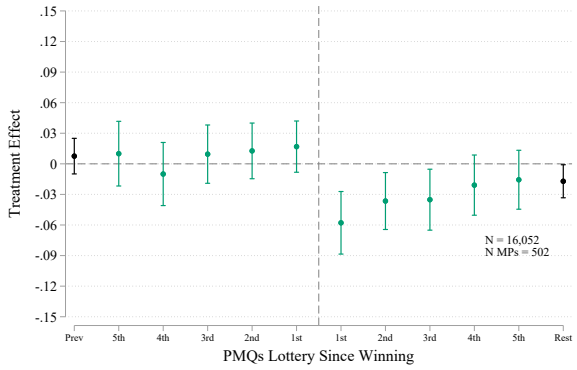
Table A21: Hybrid Lottery Winners Are No More Likely To Ask Questions Post-Hybrid

	Post-Hybrid Entry (%)		
	(1)	(2)	(3)
Won	-0.45	-1.63	0.20
	(0.93)	(1.59)	(1.15)
Observations	16,368	5,702	10,666
Gender Sample	All	Female	Male
Lottery Sample	Hybrid Lotteries Only		
Male Outcome Mean	62.3	62.3	62.3
Lottery FE	Yes	Yes	Yes
Lagged Control	Yes	Yes	Yes

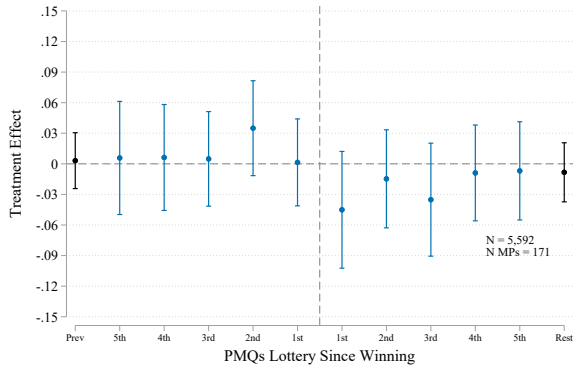
Notes: Stacked specification where the unit of observation is MP-lottery, including only lotteries during the hybrid era, and only MPs that entered each lottery. The outcome is the percentage of post-hybrid PMQs lotteries entered. Won is a dummy variable equal to one for those MPs that won the lottery. Lagged Control is the proportion of PMQs lotteries entered since the current session began. Standard errors are clustered at the MP-level throughout. *** p<0.01, ** p<0.05, * p<0.1.

Figure A25: Effects of Hybrid Questions on Future Entry

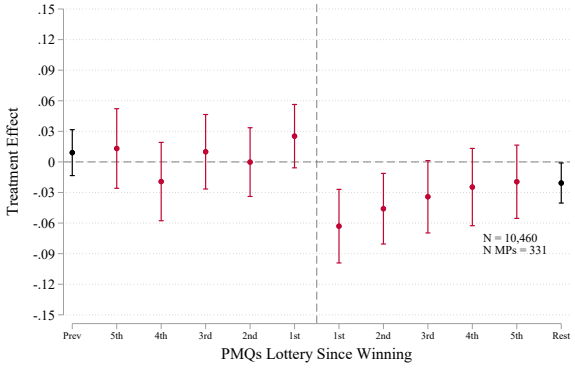
(a) All MPs



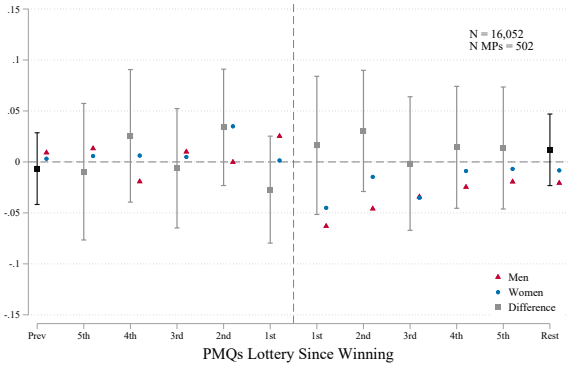
(b) Female MPs



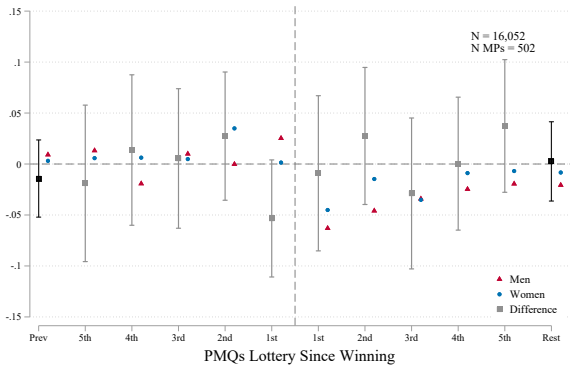
(c) Male MPs



(d) Gender Difference



(e) Gender Difference, Conditional



Notes: The figure shows the effect of winning a hybrid-era PMQs lottery on future lottery entry. See Figures 3, A9, and A10 for full details.

A Data Appendix

MP Characteristics. Further to the description in Section 3.1, we use the Parliament Members' Names Data API to find the date of birth for each MP in our sample, allowing us to calculate an MP's age on the date of each PMQs lottery. We fill in some missing dates of birth through online sources (predominantly Wikipedia and news articles), and in some cases we have slight measurement error, where only the year or year and month is known.

From the API we also construct a variable *Elections Lost*, which is the number of parliamentary elections a given MP had lost prior to first entering the House of Commons. This variable serves as a proxy for the circuitous-ness of an MP's route into national politics.

Chris Butler and Rosie Campbell kindly shared additional MP-level data, collected for MPs elected in general elections 2015, 2017, and 2019. This data has varying missingness depending on the exact variable, though still covers a large fraction of the 890 unique MPs that were eligible for at least one of the pre-hybrid lotteries. From their data we construct the following variables:

- *BAME* ($N = 876$): dummy variable equal to one if the MP is Black, Asian or Minority Ethnic.
- *State School* ($N = 760$): dummy variable equal to one if the MP was educated in a comprehensive, academy, or state-funded non-selective school.
- *University* ($N = 843$): dummy variable equal to one for having graduated from university.
- *Oxbridge* ($N = 840$): dummy variable equal to one for having attended Oxford or Cambridge University.
- *Politics Job* ($N = 841$): dummy variable equal to one for having had a politics-adjacent job prior to entering the House of Commons (e.g. other elected office, special advisor (a temporary civil servant that assists a government minister)).
- *Born Abroad* ($N = 687$): dummy variable equal to one for being born outside of the United Kingdom.
- *Born Outside England* ($N = 687$): dummy variable equal to one for being born outside of England.

Election Data. For general elections prior to 2005, we use data hosted by www.politicsresources.net, while for general elections from 2005 to 2024, we use data held by the Electoral Commission, along with House of Commons research briefings compiled by the House of Commons Library. For by-elections, we use additional research briefings.

Earlier and Later PMQs Lottery Winners. From 1990/91 to 1996/97, the lottery winners are listed on daily schedules that are available in bound journals in the parliamentary archives. We scanned and digitized these schedules. For 1997/98 to 2014/15, we web-scraped schedules available on the UK Parliament website. For 2023 to 2025, we manually assembled the lists from Order Papers on https://commonsbusiness.parliament.uk/.

Voting Attendance. See https://www.parliament.uk/about/how/covid-19-proceedings-in-the-house remote-voting/ for full details on voting procedures during COVID-19. The voting data can be found at https://hansard.parliament.uk/search/Divisions?startDate=2015-05-27&endDate=2023-06-13&house=Commons&includeCommitteeDivisions=True&partial=False&sortOrder=0. We code MPs as present or not for each vote. An MP is present for a vote whenever (i) they are recorded as having voted aye or no or both (those that vote both are "actively abstaining"), and not through assigning a proxy voter to vote on their behalf, or (ii) they were assigned the role of "teller" (and so responsible for counting the votes). Other than voting both aye and no, MPs can also abstain by continuing to occupy their seats during a vote. In this case, although they are present in the House of Commons, we would miscode them as not present, unless they satisfied (i) or (ii) for at least one other vote on the same day.

B Learning From Others Specification Details

The key regression equation for our learning from others analysis is:

$$\begin{aligned}\text{Entered}_{it+k} = \alpha_{s(t)} &+ \beta_1^k \text{Number of female winners (exc. } i)_{it} \\ &+ \beta_2^k \text{Won}_{it} + \gamma_1^k \text{Number of female entrants (exc. } i)_{it} \\ &+ \gamma_2^k \text{Number of male entrants (exc. } i)_{it} + \gamma_3^k \text{Entered}_{it} + \varepsilon_{it}\end{aligned} \tag{5}$$

The unit of observation and outcome are the same as those used in specification 1. The sample includes all MPs eligible to enter the lottery at t. Since the identifying variation is now at the lottery-level, we no longer include date fixed effects. Instead, we include session fixed effects ($\alpha_{s(t)}$), which are not needed for identification but can increase power.

Our key regressor is the number of female lottery winners at time t excluding MP i, meaning that we again estimate ITT effects. This variable is only exogenous conditional on the number of female and male entrants excluding MP i (in particular, conditioning only on the number of female entrants, we would systematically have more female winners in weeks where there are fewer male entrants, given that there are 15 winners each week). In the same regression, we include a dummy variable for whether MP i entered lottery t, and one for whether they won lottery t. It follows that β_2^k captures the effect of MP i winning lottery t on whether they enter lottery $t+k$, while β_1^k captures the effect of an additional female (other than i) winning lottery t on whether MP i enters lottery $t+k$. The γs are coefficients on nuisance controls – they are not of direct interest, nor are they interpretable as causal. As with the learning from own experience analysis, we run the regression separately for female MPs and male MPs.

We again use $k \in \{1,2,3,4,5\}$ to estimate the dynamic effects of winning on future entry, and $k \in \{-5,-4,-3,-2,-1\}$ for balance checks. We use two-way clustered standard errors by MP and by date, given that the level of treatment is now the lottery-date rather than the MP.