In this section of the appendix, we present several different model specifications (see Table A1 to A2) and corresponding simulation results (see Table A3, and Figure A1 to A2) that address alternative scenarios compared to the main results reported in the manuscript. The second column in Table A1 (Model 4A) presents a model specification of which we consider more strong and resistant attitudes than that of our original scenario (the first column in Table A1). The third column in Table A1 (Model 4B) considers a case of limited opportunity of partisan selective exposure (as to the most European countries), and the last column in Table A1 (Model 4C) presents a model of which we allow (a) agents to be more selective about their partisan information encounter proportional to their political interest level (e.g., the highly interested are more likely to be selective, whereas the uninterested are less likely to be selective), and also (b) allow those who are highly interested to be more "resistant" to counter-attitudinal messages. The second column in Table A2 (Model 4D) presents a model of which we additionally incorporate informational decay factor of old information in light of new information exposure, and lastly, the third column in Table A2 (Model 4E) examine additional scenario of which we consider an agent's indirect ("mediated") media exposure through one's political discussion network. In all of these setups, we retain two focal mechanisms – (a) amplification effect of interpersonal agreement and disagreement, and (b) contextual variations of media exposure (modeled as an election context).

Strong vs. weak attitude. For general, stable, and (relatively) hard-to-be changed attitude constructs, we expect such attitudes would exhibit (a) much more stability over time (Krosnick & Petty, 1995; Petty & Cacioppo, 1996), and they are (b) more likely to drive partisan selective media use (Brannon, Tagler, & Eagly, 2007), yet (c) less likely to be influenced by media and interpersonal discussion. The consequences of such stable, resistant attitudes would be that we tend to see "fewer" cases of increased polarization over time as a function of partisan media exposure and political discussion than compared to more malleable attitude cases (e.g., attitudes towards specific issues). For model 4A, we assume the same opinion dynamics as per our original model setup (using Model 4 as a benchmark), yet we have modified three sets of parameter values from previous models in order to reflect differences between strong attitudes and more malleable attitudes: (a) smaller decay values (changed from 0.2 to 0.1), and (b) smaller impact of partisan media exposure and (c) political discussion on attitudes, by discounting the respective parameters by half of the values from original model.

Comparing the simulation results of our original models (Model 4, presented at the first column in Table A3) with more strong attitudes (Model 4A, presented at the second column in Table A3), we see that, compared to more specific, malleable attitude cases (as represented in Model 4 reported in the main manuscript), we see virtually no polarization throughout the entire simulation time frame across 100 replicated simulation runs.

Limited opportunity structure for selective exposure. The supply of partisan selective content is arguably much higher in U.S. than in many European countries, although we are witnessing an increasing tendency of selective exposure recently within Europe as well (e.g., Skovsgaard, Shehata, & Strömbäck, 2016; Trilling, van Klingeren, & Tsfati,

2016), arguably also augmented by the role of social media for news provision. Furthermore, while media outlet-level selectivity is likely less strong in European contexts, we have less reason to think that story-level selectivity is unlikely to occur. Nevertheless, in light of our ABM specification, the limited opportunity for being exposed to partisan channel and/or partisan content implies that (a) we should see lower degrees of pro- and counter-attitudinal exposure as a function of individuals' choice. In addition, this may further imply that (b) partisan media exposure may exert a much more limited impact on determining later attitudes. This scenario then can be addressed by allowing lesser degree of selectivity in partisan channel / content as a function of existing attitudes, as implemented in Model 4B in Table A1.

The result from this setup is again presented in Figure A1 and in Table A3 below. The results suggest that, as expected, we are seeing a somewhat weaker degree of attitude polarization as a function of selective exposure than in previous results. Although over-time trends appear to be similar to our original model specification, we indeed see lesser degree of attitudinal polarization in Model 4B than in our original models during the election cycle when there is limited opportunity of selective exposure at the system level.

The role of political interest and individual differences. One of the insights from the motivated reasoning research is that some individuals may actively counter-argue or discount counter-information (Taber & Lodge, 2006), yet such a pattern only appears to be pronounced with substantially strong attitudes (Levendusky, 2013) or with high political interest (Arceneaux et al., 2013), where highly politically interested individuals are more likely to resist counter-attitudinal messages (disconfirmation bias: Nisbet et al., 2015; Tabor & Lodge, 2006). More generally, we can think of any stable individual difference factors (such as political interest or need for cognition) as additional moderating factor of which how individuals process partisan media contents. For instance, we allow (a) agents to be more selective about their partisan information encounter proportional to their political interest level (e.g., the highly interested are more likely to be selective, whereas the uninterested are less likely to be selective), and also (b) allowing those who are highly interested to be more "resistant" to counter-attitudinal messages (Zaller, 1994). From this setup, we would expect that polarization would occur more rapidly than in its original scenarios, since the gap between pro- and counter-attitudinal exposure would become greater as a function of political interest level of individuals.

For this modified setup, we multiply their degree of exposure to pro- (counter-) attitudinal information/channel by their political interest value (1 – political interest value) at each tick of the simulation, such that the degree of selective exposure of those who are highly interested in politics (e.g., 0.7 value in political interest) is set to be 0.7 times the maximum value of pro-attitudinal information/media channel that they could get based on their attitude values, whereas their counter-attitudinal exposure value is 0.3 times the maximum value of counter-attitudinal channel / information based on their prior attitudes. This modified specification effectively disproportionately discounts the degree of pro-attitudinal exposure among less interested in politics, while allowing those who are more interested in politics can "resist" the counter-attitudinal information (e.g., Taber & Lodge, 2006; Zaller, 1994).

The results of this modified setup are presented in Figure A1 and in the last column (Model 4C) of Table A1, which shows that we largely observe similar, if not identical, empirical patterns compared to the previous results. However, what is noteworthy here is that we indeed see that polarizations "taking off" earlier than in previous scenario as predicted.

Decay of old information in light of new exposure. In a real world, individuals are exposed to the same (or substantively) similar information multiple times. Provided that one is exposed to the same or substantively very similar information multiple times, the impact of later exposure of the same information would not be the same as that of prior exposure. Such exposure pattern would nevertheless "collectively" produce an enhanced message processing effect on later attitude (e.g., Cacioppo & Petty, 1989). However, when focusing on the effect of just one message (where multiple messages are separated by some temporal order), a small body of relevant research suggest that there is generally a recency effect in such a situation, in that individuals generally weigh the most recent communication more than priors due to the fact that the effect of exposure to prior messages decays over time (Chong & Druckman, 2010; Huckfeldt, Pietryka, & Reilly, 2014; Lecheler & de Vreese, 2012). This proposes that the impact of prior messages generally decays over time, such that the impact of prior messages will be generally less compared to later messages.

Based on this general idea, let us assume the impact of total prior messages, Fn-1, decays by a certain degree, β, in light of new exposure. Then, the collective impact of message exposure after new exposure, Fn, is given as:

$$Fn = 1 + Fn\text{-}1\ (1 - \beta)$$

where the impact of new message is defined as 1, and β is the decay value of the "old" message on the attitude tally. For instance, when β is given as 0.5, then the total impact of message exposure as a function of number of messages are:

No. of repetitive messages	Collective impact of all message sequence
N = 1	1
N = 2	1 + 1(1 – 0.5) = 1.5
N = 3	1 + (1.5)(1 – 0.5) = 1.75
N = 4	1 + (1.75)(1 – 0.5) = 1.875

Now, when we imagine such a situation, the implication of such "decay effect" of old information on opinion updating dynamic is clear: any repeated exposure to the same (or substantively similar) information of (k) times would produce somewhat lower impact than exposure of (k) number of different information with same valence. Consequently, the total valence, or "sum" of partisan selective exposure would be "less" than our initial cases by the order of the specific decay value of prior messages when we allow the decay effect of prior exposure. If we implement such setup, then we therefore expect to observe lower levels of polarization (as shown in Table A2, we used the decay value for old information as 0.5 – although there is no prior literature suggesting a specific decay value of such, this could serve as reasonable starting point to explore possible consequences of information decay effects).

The detailed result from this setup is presented in Figure A2 and fifth column of Table A3 (results for Model 4D). The results suggest that, as expected, we are seeing somewhat lower degrees of attitude polarization as a function of selective exposure than in previous results. Again, although over-time trends appear to be similar to our original model specification, we indeed see a lower degree of attitudinal polarization in Model 4D than in our original models during the election cycle, as described in Table A3 below.

Indirect exposure of partisan content through social networks. One potential possibility that uniquely affects the extent of partisan selective exposure on story-selection level, especially within online/social media context, is that one can more likely to be exposed counter-attitudinal media contents via "social recommendations" as suggested by Messing and Westwood (2012). They reason is that (a) the effect of "source" heuristic (e.g., "whether this information comes from CNN or FOX News?") is attenuated within social media environment (although they still play a role), and more importantly, (b) social recommendations by one's peers (e.g., "XXX number of people recommend" this article) provides much more relevant diagnostic value than source cues regarding the relevance and significance of the partisan information in question within social media context. This implies that individuals may receive pro-and counter-attitudinal information "indirectly" via their peers connected on social media.

As described in model 4E in Table A2, we additionally consider one's connected peer's pro- and counter-attitudinal exposure when calculating a focal agent's partisan media exposure, assuming one can access such information as we normally can, for instance, on Facebook. For instance, let us suppose that the focal agent has two connected peers, both of which have two degree of pro-attitudinal exposure and one degree of counter-attitudinal exposure. Then we can think of a situation where indirect exposure via one's connected neighbors increases partisan media exposure of the focal agents, such that the focal agent's own pro-attitudinal exposure is increased by 4 (2 pro-exposure * 2 neighbors), and his or her counter-attitudinal exposure is increase by 2 (1 counter-exposure * 2 neighbors) on top of his or her own partisan exposure. The results from this setup, of which the detailed over-time tends are presented in the last column of Table A3 and in Figure A2 (please see the results for Model 4E). Since we additionally consider partisan exposure of one's connected neighbors in calculating the degree of partisan exposure of the focal agent, we would expect to observe more attitude polarization over time as a function of partisan media exposure than our original cases. The results in Table A3 below suggest this is indeed the case. Also, even if we allow for such possibilities, we still see that political discussion and election context play a critical role in driving overall polarization patterns – therefore suggesting that our results and conclusions do not change fundamentally by allowing such possibility.

By and large, these additional scenarios confirm the general picture presented in the main manuscript. Overall, our results collectively point toward a consistent picture regarding the impact of interpersonal discussion network and contextual variations in explaining the reciprocal dynamics between attitude congruent media exposure and attitude polarization.

Table A1. The design of simulation experiments and key parameter values for additional models, from Model 4A to Model 4C.

	Model 4 (Original model)	**Model 4A (Strong attitudes)**	**Model 4B (Limited selectivity)**	**Model 4C (Interest interaction)**
Exposure to (dis)agree	Yes	Yes	Yes	Yes
Election cycle	Yes	Yes	Yes	Yes
Strong attitudes [a]	No	Yes	No	No
Limited selectivity [b]	No	No	Yes	No
Selectivity x Interest [c]	No	No	No	Yes
Parameter values for each model				
Opportunity for partisan media exposure	1	1	0.5	1
Counter- media exposure ratio [d]	0.4 → 0.6 → 0.5 → 0.4 (additionally weighted by interpersonal discussion)			
Propensity for homophily	0.4 → 0.6 → 0.5 → 0.4 (additionally weighted by interpersonal discussion)			
Impact of partisan media on attitude	0.4 → 0.5 → 0.4 → 0.3 (weighted)	.2 → .25 → .2 → .175 (weighted)	0.4 → 0.5 → 0.4 → 0.3 (weighted)	0.4 → 0.5 → 0.4 → 0.3 (weighted)
Impact of discussion on attitude	0.4 → 0.5 → 0.4 → 0.3 (weighted)	.2 → .25 → .2 → .175 (weighted)	0.4 → 0.5 → 0.4 → 0.3 (weighted)	0.4 → 0.5 → 0.4 → 0.3 (weighted)
Attitude decay (on later attitude)	0.2 (weighted)	0.1 (weighted)	0.2 (weighted)	0.2 (weighted)

Note: (a) *Strong attitudes*: represents cases with more strong attitudes (e.g., ideology) than in original scenario (e.g., candidate preference). (b) *Limited selectivity*: represents cases where the opportunity of partisan selective exposure is limited (e.g., within Europe) than in original scenario (e.g., U.S). (c) *Selectivity – interest interaction*: those with higher political interest are disproportionally more likely to consume pro-attitudinal media while selectively avoid or resist to counter-attitudinal media.
(d) *Counter-media exposure ratio*: denotes the ratio of counter-attitudinal media exposure relative to pro-attitudinal media.

Table A2. The design of simulation experiments and key parameter values for additional models, from Model 4D to Model 4E.

Model settings	**Model 4 (Original model)**	**Model 4D (decay of prior exposure)**	**Model 4E (indirect exposure via social network)**
Exposure to (dis)agree	Yes	Yes	Yes
Election cycle	Yes	Yes	Yes
Prior exposure decay [a]	No	Yes	No
Indirect exposure [b]	No	No	Yes
Parameter values for each model			
Calculation of Partisan media exposure	Only direct exposure	Only direct exposure	Direct exposure + exposure of social network peers
Decay value of prior (repetitive) exposure	0	0.5	0
Counter- media exposure ratio	0.4 → 0.6 → 0.5 → 0.4 (additionally weighted by interpersonal discussion)		
Propensity for homophily	0.4 → 0.6 → 0.5 → 0.4 (additionally weighted by interpersonal discussion)		
Impact of partisan media on attitude	0.4 → 0.5 → 0.4 → 0.3 (additionally weighted by interpersonal discussion)		
Impact of discussion on attitude	0.4 → 0.5 → 0.4 → 0.3 (additionally weighted by interpersonal discussion)		
Attitude decay (on later attitude)	0.2 (additionally weighted by interpersonal discussion)		

Note: (a) *Prior exposure decay*: represents cases where the impact of any repetitive exposure of same (or substantively similar) exposure is discounted as a function of decay value (we've used arbitrary 0.5 value here). (b) *Indirect exposure*: denotes the situation where one's connected neighbors (via political discussion network) indirectly affect the degree of partisan selective exposure.

Table A3. Comparison of the simulation results from varying model setups, 100 simulation runs per each model

	Model 4 (original model)	**Model 4A (Strong attitudes)**	**Model 4B (limited selectivity)**	**Model 4C (Interest interaction)**	**Model 4D (decay of prior exposure)**	**Model 4E (indirect exposure)**
Variance at t_{550}	M = 6.51 (SD = .86) Max = 7.50	M = 0.59 (SD = .01) Max = 0.62	M = 5.77 (SD = .70) Max = 6.63	M = 7.03 (SD = .95) Max = 7.84	M = 6.31 (SD = .56) Max = 7.04	M = 7.03 (SD = .95) Max = 7.84
Kurtosis at t_{550}	M = -1.38 (SD = 1.41) Max = 12.07	M = -.29 (SD = .07) Max = -.07	M = -1.33 (SD = .65) Max = 2.19	M = -1.34 (SD = 2.25) Max = 20.46	M = -1.49 (SD = .45) Max = 1.30	M = -1.34 (SD = 2.25) Max = 20.46
ER-index at t_{550}	M = .74 (SD = .09) Max = .85	M = .17 (SD = .002) Max = .18	M = .68 (SD = .08) Max = .79	M = .79 (SD = .10) Max = .88	M = .73 (SD = .06) Max = .81	M = .79 (SD = .10) Max = .88

Note: Cell entries are mean, standard deviation, and maximum value of indicators of attitude polarization (variance and kurtosis of attitude distribution, and ER-polarization index), averaged across 100 replicated simulation runs per each model setup. We present average statistics at t = 550 slice as an exemplary case. Detailed setups are presented at Table A1 to A2, and graphical depiction of over-time trends are presented at Figure A1 to A2.

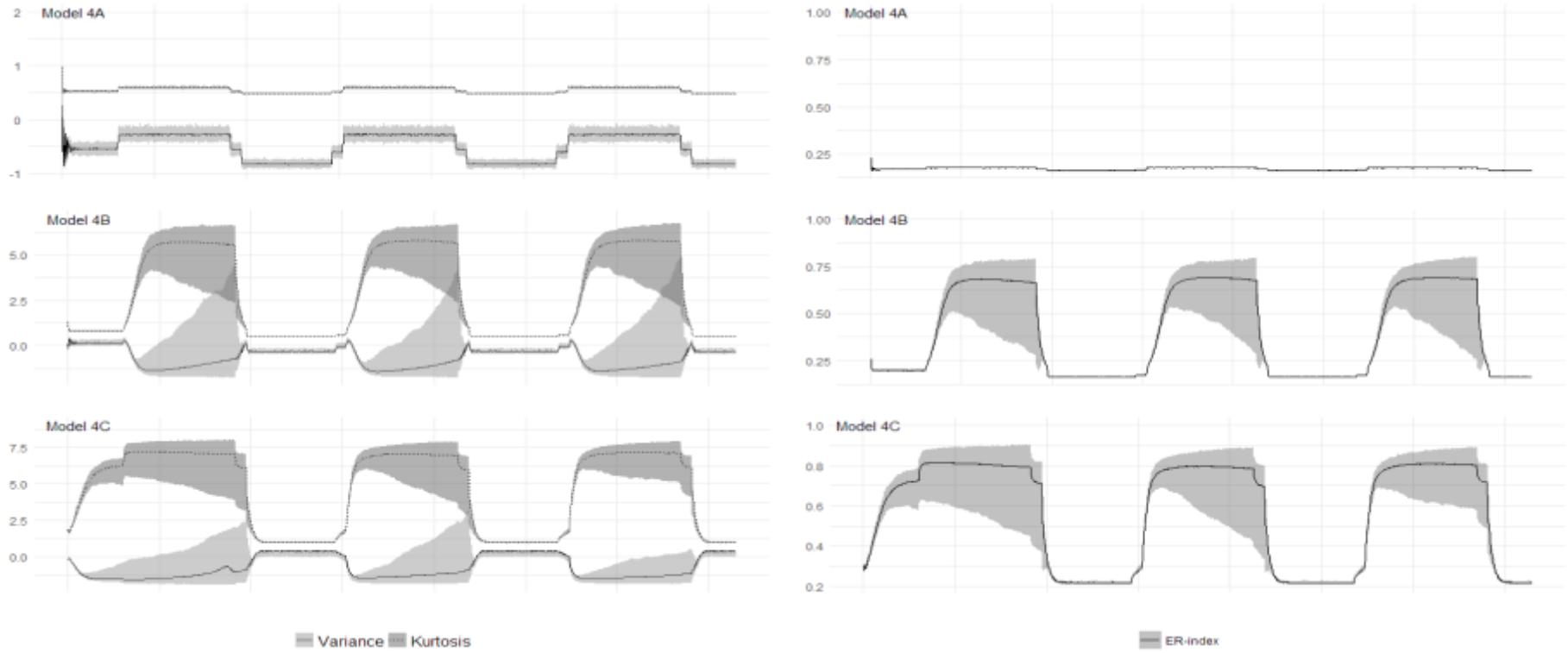

Figure A1. Over-time trends of attitude polarization index from additional model specifications, from Model 4A to 4C

Note: Model 4A examines the cases of strong attitude construct (e.g., ideology or party identification), where such attitudes exhibit much more stability over time and less likely to be influenced by the exposure to partisan media and political discussion. Model 4B examines the cases of limited opportunity for selectivity, where we assume the supply of partisan media is less likely than original scenario (therefore agents are less exposed to partisan media). Model 4C consider situations where those who are more interested in politics are more likely to consume pro-attitudinal partisan media/information, and at the same time, they are more likely to resist to counter-attitudinal partisan media/information (A detailed setup of these additional models in comparison with the original scenario is presented in Table A1 in this appendix).

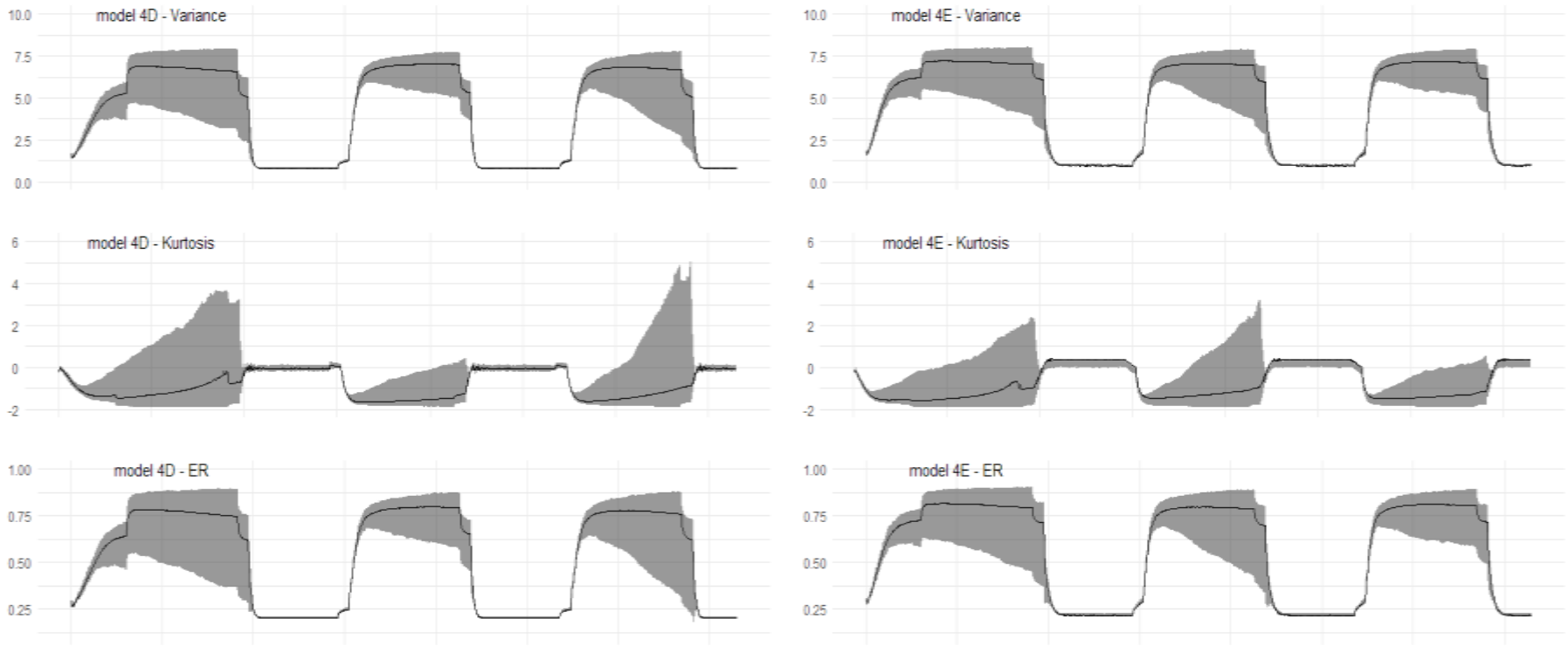

Figure A2. Over-time trends of attitude polarization index from additional model specifications, Model 4D and 4E.

Note: Model 4D examines the cases where the impact of prior partisan media exposure decays when repeated exposure occurs during partisan selective exposure. Model 4E examines the cases where we allow indirect exposure via one's social connections (A detailed setup of these additional models in comparison with the original scenario is presented in Table A2 in this appendix).