

Are algorithmic bias claims supported?

In their Special Issue Research Article, “Asymmetric ideological segregation in exposure to political news on Facebook” (28 July, p. 392), S. González-Bailón *et al.* analyzed links to news that US Facebook users shared and viewed during the 2020 election and found substantial ideological segregation in content on Facebook. They claim that Facebook’s news feed algorithm increases ideological segregation. However, the evidence suggests that news feed ranking does not increase partisan segregation overall, at least for the sample and timeframe under study.

González-Bailón *et al.* analyzed data aggregated both by source (i.e., domain or website) and by URL (i.e., the specific webpage). Source-level analysis pools both liberal and conservative webpages from the source together, artificially reducing estimates of segregation. This aggregation bias can be particularly problematic on non-news websites, such as Youtube, Twitter, and Reddit, where users encounter twice the partisan content (*I*) they see on news sites. Indeed, González-Bailón *et al.* point out this problem in their discussion section: “[A] focus on domains rather than URLs will likely understate, perhaps substantially, the degree of segregation in news consumption online.”

In Figure 2, B and C, González-Bailón *et al.* show the ideological segregation of all content that users were eligible to see (potential audience) compared with the segregation of content users actually see as a result of news feed ranking (exposed audience). On the basis of the domain-level analysis (Figure 2B), they argue that algorithmic news feed ranking increases ideological segregation. However, the URL-level analysis (Figure 2C), which includes the ideological slant of individual webpages, reveals that the ideological segregation of the overall sample is higher than the domain analysis reflects. As a result, in the URL-level analysis, there is no meaningful difference in ideological segregation before and after news feed ranking. [There are traces of algorithmic segregation in content shared by users and pages but not groups (figure S14) and when looking only at the subset of users classified as having high political interest (figure S19B compared with figure S19D)].

The observational URL-level analysis is consistent with the causal evidence in the related Special Issue Research Article (2), in which A. M. Guess *et al.* analyze an experiment that compares news feed ranking to a simple reverse chronological

algorithm. In contrast to the conclusions of González-Bailón *et al.*, Guess *et al.* find that news feed ranking decreases, rather than increases, exposure to like-minded political content (table S20) and political news from partisan sources relative to reverse chronological feed (supplementary text S3.3).

Although evidence in both of these papers suggests that news feed ranking has limited effects on partisan content delivery, caution is warranted when drawing conclusions about the effects of ranking algorithms on ideological segregation. As González-Bailón *et al.* point out, friend, page, and group recommendation algorithms may serve to polarize the network of relationships that users form on the platform. Future work should attempt to more broadly understand social media as a complex ecosystem.

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COMPETING INTERESTS

S.M.’s disclosures are available at <https://solomonmg.github.io/disclosures/>.

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Response

Messing asserts that data at the URL level do not support our claims that algorithmic curation affects ideological segregation on Facebook. However, he acknowledges the presence of statistically significant differences in segregation levels at the potential and exposed levels in subsets of the data. These differences serve as evidence that algorithmic curation increases segregation but also that this increase reveals complex dynamics, contingent on platform features.

Messing acknowledges that there is evidence of increased algorithmic segregation in content shared by users [consistent with his own work (*I*)] and pages (figure S14, A, B, D, and E). Messing describes the size of these effects as “trace,” but the differences are substantively and statistically significant, as the confidence intervals around the time trends (based on a local polynomial regression) suggest. Messing states that there is no evidence of algorithmically driven increased segregation for Facebook groups, but the evidence suggests that algorithmic curation actually drives a very large and statistically significant reduction, rather than an increase, in segregation levels (figure S14C). Although the reasons behind

the conflicting results are unclear, the data confirm that Facebook’s purposeful choices about how algorithmic curation operates shape the content users see on the platform.

Messing also acknowledges a small difference for users with high political interest but minimizes the value of this observation. Focusing on this subgroup, compared with users that are uninterested in politics, can provide important information regarding the relationships between political preferences and Facebook’s feed algorithm. As Messing notes, segregation at the URL-level increases as we move down the “funnel of engagement” from potential to exposed audiences (see tables S10 and S14 and figure S19B). The difference is substantively and statistically significant for most of the observation period.

Although Messing analyzes Figure 2C, he overlooks Figure 2F. This panel shows that polarization (i.e., the extent to which the distribution of ideology scores is bimodal and far away from zero) goes up after algorithmic curation. In particular, the size of the homogeneous “bubble” on the ideological right grows when shifting from potential to exposed audiences. This is true both for URL- and domain-level analyses (Figure 2, E and F).

Messing argues that our results are inconsistent with the findings in Guess *et al.* (2). However, that study of about 23,000 Facebook users compares exposure with the standard Facebook algorithm versus reverse chronological ordering. It was not designed to evaluate 208 million Facebook users’ platform-wide patterns of segregation in news consumption or compare potential and actual exposure. In addition, Guess *et al.* did find an algorithmic feed effect, noting that it increases exposure to like-minded posts more than it decreases crosscutting posts.

As we repeatedly state in our Research Article, algorithmic bias requires nuanced assessment, and our results do suggest a complex intertwining of algorithms and platform features that affect ideological segregation, especially on the political right. We agree that more research is essential, especially given that Facebook has introduced purely algorithm-driven content into feeds since 2020 (3).

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