A Network analysis of Intermedia Agenda-setting in the News discourse about the Mpox epidemic

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News media can shape public perceptions of political reality and subsequent attitudes towards important health issues (1,2). Crucially, Intermedia Agenda-Setting (IAS) theory posits that news discourses are characterized by outlets that influence each other's coverage by co-orienting journalists towards a specific agenda (3). Prior work (3,4) has shown the merit of representing IAS as a network influence problem, by defining the news outlets as nodes and intermedia influence as directed edges. Given how partisan leanings of news outlets drive their reporting (5), we ask: how does outlet partisanship interact with IAS in intermedia influence networks? Are outlets primarily influenced by other co-partisan, or counter-partisan outlets?

In this paper, we studied IAS in the context of the news discourse during the Mpox epidemic of 2022 in the United States. As Mpox disproportionately (94% of case counts) affected men who have sex with men (MSMs) (6), we focused on the controversial and competitive framings surrounding homosexuality and sexual transmission as factors driving the epidemic. While right-leaning news articles overwhelmingly stigmatized MSMs and preached abstinence, left-leaning articles offered competing frames, highlighting the need for sex-positive and queer affirmative approaches.

We obtained 594 articles published between 1st May and 31st October 2022 by 16 national news outlets from media cloud (7), and annotated them using applied thematic analysis (8), identifying competitive news frames surrounding sexuality and Mpox. Then, we derived time series for 16 news outlets over 6 months, signifying the proportion of published articles every day that featured these framings. In contrast to prior studies that used granger causality to infer relationships (3,4), we used a methodological pipeline combining Bayesian structure learning (9) with transfer entropy (10), dropping the assumption of pairwise independence between edges.

Thus, we inferred a weighted and directed network of intermedia agenda-setting relations (Figure 1A). In contrast to previous findings where mainstream left-leaning outlets such as the New York Times were primary agenda-setters, our analysis underscored low credibility, right-leaning outlets such as Breitbart and Blaze as central influencers. Interestingly, left-leaning outlets exhibited negligible partisan-aligned ties (Figure 1B), borrowing agendas primarily from right-leaning outlets. Importantly, we found that this counter-intuitive result was not true for Mpox-related agendas without competitive framings (such as critiques about vaccine disparities), suggesting that counter-partisan agenda-setting was driven by the controversial and competitive narratives surrounding sexuality. Our study provides important insights as to how social network analysis can be leveraged to understand the reactive intermedia influence patterns underlying health controversies.
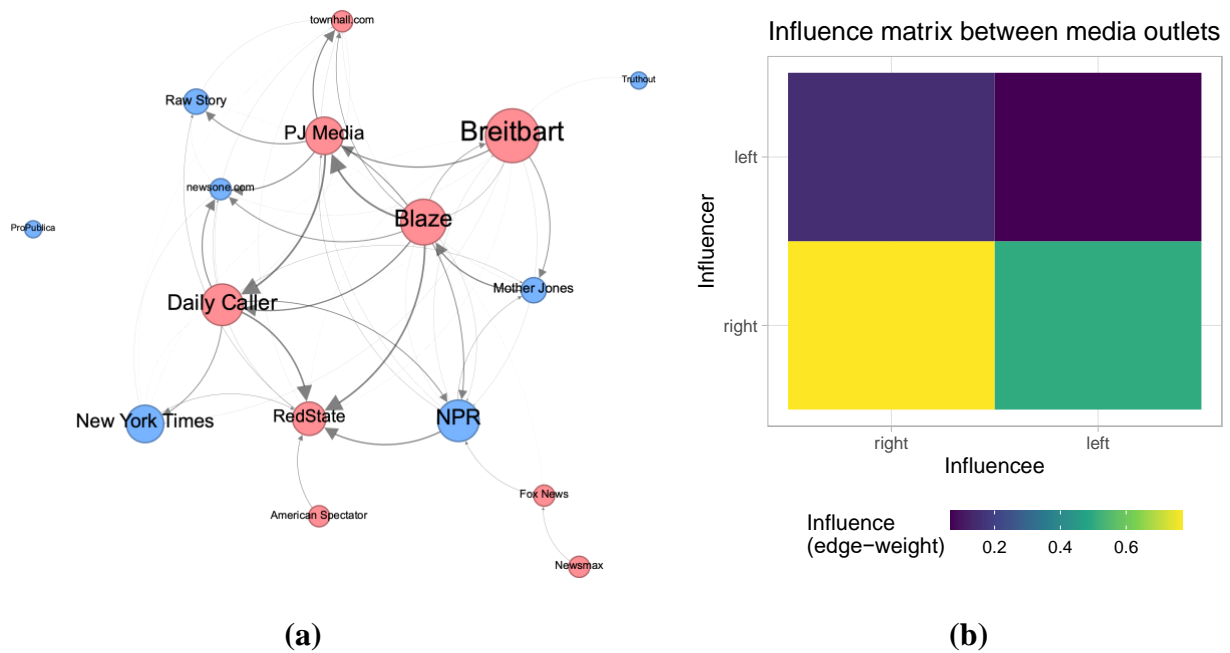
(a)   **(b)**

Figure 1: Intermedia influence network (left) and normalized mixing matrix (right)
(a) Network of influence between 16 news outlets plotted using Force Atlas layout. Edge weight and opacity denotes strength of influence, node size is scaled by out-degree and node color denotes partisan leaning of the outlet (red and blue are right and left-leaning respectively). Right-leaning outlets are central actors.
(b) Total influence of an average influencer (Y-axis) on influencees (X-axis). On average, right leaning outlets influence each other the most. Notably, left leaning outlets are influenced the most by right-leaning outlets, as opposed to other left-leaning outlets.

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