

Cumulative deliberation: Patterns and effects of online opinion cumulation and how humans would trust machines to detect it

Today, online discussions form the bulk of public communication. In many recent studies, the new complexity of public discussion brought along by millions of simultaneous discussants is conceptualized as dissonance, disconnectedness (Pfetsch, 2018), and discontinuity (Prigogine, 2000; Smoliarova et al., 2020) of public spheres, and user contribution to deliberative processes is often seen as destructive. However, this may come from the fact that the current theory of public deliberation poses the same demands of civil and consensus-oriented speech to all the participants of public discussions, unequivocally stretching them to ordinary users in everyday speech interactions. We see this as a conceptual problem, as it contributes to seeing online discussions as unpredictable and dissonant, users as uncivil, and online discussions as a digital threat to substantial deliberation, rather than a source of grassroots opinions and legitimate discontent.

We suggest a reconceptualization of deliberation for the current state of public communication and introduces the concept of cumulative deliberation. We argue that the nature of opinion formation and deliberation online is predominantly *cumulative*. The concept highlights the role of cumulative patterns and effects in online opinion formation, as opposed to round-robin dialogical and rational deliberation. Cumulation of opinions was studied in the works as distant in time and methodologies as those on the spiral of silence (Noelle-Neumann, 1974), online silent majorities (Mai et al., 2018), political polarization and echo chambering (Conover et al., 2011), information cascades (Jalili & Perc, 2017), and many more. What unites these works is that aggregated and cumulative patterns and effects of how opinions form matter *per se*. This allows for seeing ‘tiny acts of [user] participation’ (Margetts et al., 2015) as bearing non-negligible roles in opinion formation, even if not necessarily initially intended for rational deliberation.

Such understanding implies a new normativity. We would see ordinary people with their personal traits and features of speech as legitimate, even if tiny, actors of public deliberation and re-assess the demands for quality of their contributions. Acknowledging the users’ right for non-rationality and non-dialogicity would allow for closer-to-life predictions of online opinion formation without putting an excessive normative burden to individual users. Instead of demanding orientation to consensus from all discussion participants on social media, the new concept helps add value to micro-acts of deliberation, including posts and comments, however emotional, aggressive, or trivial they might be, as, taken together, they are non-negligible within the process of public deliberation, and any act may become a bifurcation point. Moreover, the new normativity would

allow for healthier distinguishment between users' legitimate discontent, indignation, or anger, on one hand, and hate speech, computational propaganda, and uncivil and abusive verbal behaviors, on the other.

We designate eight sub-fields of cumulative deliberation research, namely: 1) new normative demands to cumulative deliberation; 2) cumulative patterns of opinion formation on five levels (see author, 2023); 3) endogenous (discursive) factors that shape user participation and opinion cumulation, e.g., aggressive speech or expressed attitudes; 4) exogenous factors that shape opinion cumulation, including platform affordances and discussion contexts; 5) the effects of opinion cumulation within discussions, including effects upon user participation, grouping, or interaction; 6) the effects of cumulative opinions upon offline deliberation and political decision-making – that is, the effects of hybrid deliberation; 7) comparing cumulative deliberation in various types of media systems and public spheres, including democracies and non-democracies; and 8) (automated) methods and tools for detection of opinion cumulation patterns and effects.

Each of the sub-fields is actively studied, but they need systematization and normative reconceptualization, and, in some cases, substantial rethinking. In particular, the field of automated text analysis, despite being extremely diverse, all runs into a conceptual trap that is yet underestimated. Thus, opinion mining studies very rarely discuss conceptually what 'opinion' actually is; moreover, with the development of neural networks, the gap between the human and machine 'thinking' on how opinions look like (and, thus, how they grow and accumulate) seems to diminish but is not completely overcome. The first-wave big data studies have brought along the methods of opinion mining which largely reduced the diversity of opinion forms by 'planting' opinions into lexicons with particular semantics relatively easy to detect in a 'yes/no' manner – this includes nearly all major text classification/clustering methods, like sentiment analysis and topic modeling. However, in various branches of social sciences, 'opinions' vary from answers to questions in polls to arguments, attitudes, certain linguistic types of statements (e.g., enthymemes), and long and elaborated reflections like in journalism and literature. And the differences between concepts of opinions matter not only academically but also politically, as they perform various roles in local, national, and global(ized) public spheres. The machine-based approaches are today too diverse to form a unified vision on what a 'machine-visible opinion' is, while they are so far too similar to each other in neglecting the truly complicated nature of how opinions live in public speech.

Today, though, newer neural-network methods, like abstractive summarization of user texts, allow for human-like representation of summarized opinions of many discussion participants. The rapid

development of such methods, combined with the idea of cumulative deliberation, poses two new fundamental questions, equally important for the practice of public deliberation and for the science that studies it. The first question is: What is an accumulated opinion? What is a cumulative *expression* of opinion? And what can be accepted politically as cumulative view/attitude statement by a deliberative (micro-)public? And, since such opinions can *only* be captured via (semi-)automated means, the second question is: What does the machine recognize as cumulative opinion? Does the latter differ from its human interpretation? How do we trust machines to detect online opinions, and how do we trust the machine-detected cumulative opinions? These questions need to guide our today's studies of cumulative opinion formation and hybrid deliberation.

Keywords: online communication, public opinion, deliberation, cumulative deliberation, opinion mining, new normativity

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