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Evaluating Conflict, Interest Advancement, and Representation in Collaborative Governance

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ABSTRACT

Representation, conflict among stakeholders, and how both shape outputs are of growing interest in collaborative governance research. As individuals negotiate diverse viewpoints, conflict is expected, yet gaps remain in understanding if conflict, or lack thereof, helps explain output prioritization. In this paper, we explore: (i) if more communication is associated with topics succeeding or failing to be prioritized; (ii) if communication from different types of actors (i.e., different sector affiliations/core or peripheral members) is associated with prioritization; (iii) how conflict and concord embedded in communication associate with prioritization; and (iv) whether patterns of prioritization can be identified. Using Hierarchical Latent Dirichlet Allocation modeling and multi-group QAP models, we evaluate associations between topical issues discussed and annual objectives, finding: (i) communication quantity is necessary but insufficient in prioritization; (ii) who communicates is vital to prioritization; and (iii) conflict is only detrimental when its association is greater than concord.

1 | Introduction

Diverse stakeholder representation is normatively and practically central to collaborative governance, though nuanced assessments of how representation materializes in the structure, actions, and outputs of collaboration have been relatively limited. Recent research broaches this limitation with refined conceptualizations of representation (Koski et al. 2018; Siddiki and Ambrose 2023; Ambrose 2024; Ambrose and Siddiki 2024) and applications of new analytical techniques to measure and evaluate representation (Ulibarri and Scott 2017; Scott et al. 2020; Siddiki and Ambrose 2023; Ambrose 2024). Despite this attention, key research gaps remain. Core among them is evaluating the connection between what actors are advocating through their deliberation (i.e., representation in collaborative processes) and the topics that are advanced as collaboration priorities (i.e., representation in collaborative outputs). More practically, this gap represents the difference between being "invited to the table" and being able to advance your own interests. It further exposes opportunities to understand consistencies and discrepancies among different forms of representation (e.g., consistency among those represented at the table and those whose interests are being advanced in collaborative output).

Scholars have begun to differentiate and evaluate how different stakeholders engaged descriptively and substantively in collaborative arrangements (Koski et al. 2018; Ambrose 2024; Ambrose and Siddiki 2024). Descriptive representation accounts for who is invited to participate in collaborative arrangements, whereas substantive representation captures who actually attends and participates in them. Additionally, substantive representation captures whether, and to what extent,

different stakeholders' interests and priorities are reflected in the agendas and outputs of collaboration. Consistency in different forms of representation is often assumed. However, past studies and theory suggest that ongoing negotiations, resource disparities, and differing preferences among diverse stakeholders within collaborative fora may sponsor discrepancy among descriptive and substantive forms of representation (Lubell 2013; Jenkins-Smith and Sabatier 1994; Emerson and Nabatchi 2015). Furthermore, participants of collaborative fora may struggle to agree on 'the actual problems' and then further struggle to agree on what actions should be taken to address the problems—materializing in discrepancy among representation in form (i.e., who is invited to the collaboration), process (i.e., who participates in the collaboration), and/or outputs (i.e., what is produced by the collaboration) (Jenkins-Smith and Sabatier 1994; Emerson and Nabatchi 2015).

In this competition to advance individual issues, inter-stakeholder disparities and differing viewpoints may also be cast as, or foment, conflict. Conflict can be constructive or destructive dynamics within collaborative arrangements (Emerson and Nabatchi 2015; Heikkila and Gerlak 2019), but, in either case, the specific dynamics are an understudied aspect of diverse stakeholder collaboration. While communicated conflict in collaboration might be expected as individuals negotiate diverse viewpoints, we work to discern whether conflict, or lack thereof, helps explain topic prioritization. Further evaluation of conflict alongside assessments of substantive representation (i.e., who is discussing what issues) can lend understanding of whether inter-stakeholder conflict shapes how substantive representation takes form within different facets of collaboration. Stated differently and framing our overarching question, does the observation of communicated conflict in collaborative groups associate with interest advancement (i.e., constructive conflict) or associate with failed advancement (i.e., destructive conflict)?

In this paper, we couple research on conflict and representation in collaborative governance. While our focus is on conflict, we must also account for other explanations for interest advancement. For example, is the topic simply discussed more, garnering more attention, or are more central actors better able to advance their interests? Thus, we specifically investigate: (i) the extent to which more intensive participation through communication is associated with topics succeeding or failing to be prioritized (i.e., becoming collaborative outputs as annual objectives); (ii) the extent to which communication from different types of actors (i.e., actors with different sectoral affiliations and core or peripheral members) is associated with prioritization; (iii) how conflict and concord embedded in communication associate with prioritization; and (iv) whether patterns of issue prioritization can be identified. Contributing to collaborative governance research, these questions are fundamental to understanding representation in collaborative governance arrangements, as they enable understanding of consistency among different forms of substantive representation, but also how deliberations among collaboration participants can be managed and mediated to encourage consistency.

Our specific case leverages 8 years of meeting minute data from an environmental justice (EJ) council, typically composed of diverse arrays of stakeholders—including government, community members, and relevant organizations (e.g., environmental and justice-oriented non-profits, chambers of commerce). EJ councils also address a diverse array of topics, including climate change planning, disaster management, reduction of pollution in overburdened communities, equitable conservation and public land use, clean energy transitions, sustainable infrastructure, and civil rights. Given diverse stakeholders and topics, as well as a typically broad mandate, EJ councils have significant room to specify, negotiate, and adapt the specific issues that they address over time. We use Hierarchical Latent Dirichlet Allocation (i.e., hLDA) modeling to identify case-specific, emergent issues in the forum, and multi-group QAP models to evaluate the factors associated with issue prioritization.

2 | Literature Review

Collaborative governance (CG) is defined as the sustained engagement of diverse arrays of policy stakeholders within the policy process to advise or carry out policy formulation and/or policy implementation activities (Innes and Booher 2003; Emerson and Nabatchi 2015; Ansell and Gash 2008). Fundamental to this definition is the representation of diverse stakeholders who have a vested interest in the goals, activities, and/or outputs of collaborative groups. Representation in CG is valued for encouraging broad and meaningful public participation (Nabatchi 2012; Quick and Feldman 2011) and is viewed as a practical strategy for soliciting broader information on policy issues, identifying new policy alternatives, and developing more contextually appropriate policies (Ostrom 1990; Jenkins-Smith and Sabatier 1994). Yet, CG research has only begun to explore variations in representation across different stages of the collaboration process (Siddiki and Ambrose 2023).

This study leverages a process-oriented lens of representation delineating: (1) descriptive representation; and (2) Ambrose 2024; substantive representation (Koski et al. 2018; Pitkin 1967). Descriptive representation is defined as formalized representation of stakeholders within a collaborative process, or "who should be at the table." Substantive representation has been delineated in terms of (1) substantive representation in process, observed as attendance and participation in collaborative fora; and (2) substantive representation in outputs or outcomes of collaboration, observed as presence of stakeholders' interests in the agendas, priorities, and outputs (e.g., policies, programs) of collaborative groups. While this process-oriented lens of representation helps conceptualize different forms of representation, it also allows for assessments of consistency (and discrepancy) between forms. In this paper, we assess how substantive representation in participation (i.e., communication relating to topics germane to the collaboration) map to substantive representation in outputs (i.e., the collaboration's future agenda identified through their annual objectives).

We focus on the outputs of the collaboration as the annual objectives that the collaboration internally develops and passes at the end of each year for practical and theoretical reasons. Practically, given the timing of these annual objectives, we can confidently associate the communication of that year with the annual objectives passed at the end of the same year, representing a clear link in interest advancement across forms of representation.

Theoretically, these annual objectives represent the furthest advancement of interests within the collaboration without having to control for external factors. Many collaborative groups, including this case, have no power to implement. While representation in outcomes (i.e., if an interest is actually implemented) is more practically relevant, implementation is dependent on the decisions of actors outside of the council (i.e., the executive, legislators, bureaucratic agents). Stated more plainly, while the dynamics within the collaboration might point to everyone agreeing that a program should be implemented, it is outside the control of the collaboration to actually implement it. This gap between observed CG behavior and observed implementation will cause noise and inaccurate estimates of outcomes. Thus, we argue that internal outputs should be used to evaluate dynamics internal to the collaboration.

We evaluate conflict/concord among collaboration participants as it is linked to particular topics, discerning whether conflict, or lack thereof, helps explain topic prioritization. Conflict and disagreement might be expected in CG as actors with varying professional affiliations leverage different forms of information (i.e., technical knowledge vs. lived experiences), express varying policy interests, and bring different understandings of policy problems to collaborative fora (Weible 2008; Carboni et al. 2017; Innes and Gruber 2005). Further lending to potential conflict, CG arrangements are often charged with recommending or formulating policies meant to address complex problems for which they are required to identify specific policy proposals (Jones 2001; Simon 1950). These complex problems are often represented by interdependent but competing needs, which are often reflected in the interdependent but competing interests of those participating in CG arrangements (Fischer and Leifeld 2015; Ansell and Gash 2008; Imperial 2005; Wondolleck and Yaffee 2000). Thus, irrespective of the process's inclusive design, stakeholders often engage in collaborative processes with the intent of prioritizing their particular policy interests.

Given a baseline of diverse actors, diverse interests, and complex policy domains, which stakeholders are represented and how they are represented in collaborative arrangements is important. The process-oriented frame of representation presented above helps evaluate the consistency and/or discrepancies among different forms of representation, as it focuses not only on who is engaging but also whose interests are reflected in collaboration outputs, calling to attention the patterns of participation that associate with issue prioritization (Nabatchi and Leighninger 2015; Ulibarri and Scott 2017).

2.1 | Communication in Collaborations

While there are multiple ways actors participate in collaboration, in this study, we capture participation through communication. Scholars often highlight the importance of communication in collaborative arrangements identifying stakeholders' need to: (1) reveal and explain their interests and concerns, (2) deliberate to discuss problems and opportunities, and develop shared understanding (Emerson and Nabatchi 2015; Innes and Booher 2003). Candid communication and deliberation are often associated with successful collaboration (Ulibarri and Scott 2017; Emerson and Nabatchi 2015; Imperial 2005).

Furthermore, through the sustained engagement of actors across the boundaries of public agencies, private sectors, and civil spheres (Emerson and Nabatchi 2015; Ansell and Gash 2008), CG is identified as a process aimed at changing the representation observed within communication fostering thick participation. *Thick participation* is characterized by: (1) fostering communication across actors to provide rich information, (2) presenting and debating a range of policy choices, and (3) giving stakeholders a sense of political legitimacy through genuine discussion (Nabatchi and Leighninger 2015). Scholars argue that CG is not a simple aggregation of interests, but a thoughtful examination of issues that comes to a judgment of what represents the common good (Emerson and Nabatchi 2015; Roberts 2004). Thus, not only does communication and the exchange of ideas and information matter in CG, but intensive communication focused on broad deliberation across the collaboration membership—the principles of thick participation—is also important (Ulibarri and Scott 2017).

Proposition 1. *Topics discussed more intensively within collaborative processes are more likely to be converted to annual objectives representing topic prioritization.*

2.2 | Core and Peripheral Members

CG arrangements often exhibit a council-in-a-council effect, where some members of the collaboration become core to its activities over time while other members remain on the periphery (Carboni et al. 2017; Koski et al. 2018). Core members of collaborations could be understood as having a dedicated understanding of the collaboration's purpose, consistent engagement over time, and often hold political and relational skills (Koski et al. 2018; Weible 2008; Crosby and Bryson 2005). While research has shown that members of the core group may hold diverse viewpoints, these actors often have the power to constrain the topics of discussion from the broader and more diverse range held by the peripheral members of the group (Koski et al. 2018; Bryson et al. 2015). Thus, core members might be expected to use their skills and influence to steer the collaborative process towards their preferred objectives.

In this paper, core members are defined as the most active communicators across the overall communication network, as identified in Figure 1A. More extensive communication by core members (i.e., Figure 1B) is expected to increase the likelihood of topic prioritization. Furthermore, while core members engage consistently, research shows that peripheral members may selectively choose to engage based on the given issue (Weible 2008). Given their lack of influence and power in the collaboration, extensive communication by peripheral members (i.e., Figure 1C) is expected to decrease the likelihood of topic prioritization.

While we might expect peripheral members to have less influence, we do not expect them to be inactive in the collaboration. Despite their narrow engagement on a smaller set of policy issues, CG is often touted for engaging diverse viewpoints in decision-making (Innes and Booher 2003). Specifically, communication between peripheral members and core members should be expected, as the peripheral members, who are issue-specific actors, participate in the collaboration by offering their

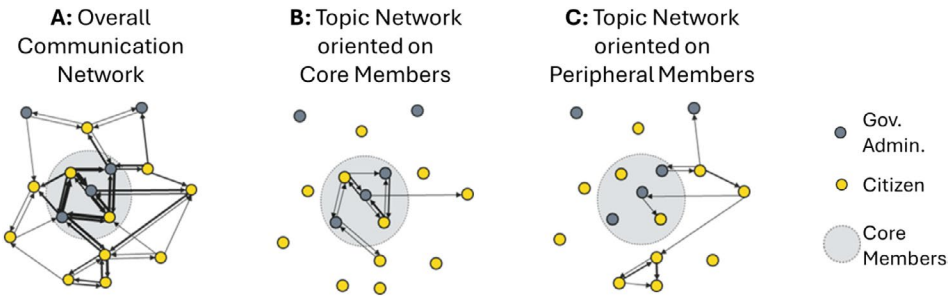

FIGURE 1 | Network communication structures across participation types. [Color figure can be viewed at wileyonlinelibrary.com]

domain-specific information to core members (Weible 2008; Wondolleck and Yaffee 2000). Furthermore, despite their peripheral status in the collaboration, actors might be leaders or experts for specific topics given their subject matter expertise. As such, literature suggests that knowledge experts can be important to advancing specific interests despite their peripheral status (Weible 2008).

While work has begun to identify the different actions of core and peripheral actors as they are represented in CG (Koski et al. 2018; Ambrose 2024; Ambrose and Siddiki 2024), little work has examined how these actors are associated with output representation.

Proposition 2. *Topics discussed more intensively by core members are more likely to be converted to annual objectives representing topic prioritization.*

2.3 | Policy Conflict and Concord

CG arrangements are venues in which diverse arrays of policy stakeholders engage, debate, and seek to advance their policy goals, becoming analytical focal points to evaluate conflict and concord among actors (Weible 2008; Innes and Gruber 2005; Emerson and Nabatchi 2015). Recently, collaborative processes scholars have called for further inquiry into the phenomenon of policy conflict and policy concord (Yi et al. 2022; Weible and Heikkila 2017). Policy conflict is defined as disagreement among policy actors about the content and/or purpose of policy, whereas policy concord is defined as, along the same elements, general agreement among policy actors (Yi et al. 2022). The concepts of policy conflict and concord are theoretically identified (Yi et al. 2022; Schattschneider 1960) but are rarely engaged directly, as "theories and frameworks of policy and politics typically treat conflict as a background concept where it is … measured indirectly as political mobilization, political activities, or competing values" (Weible and Heikkila 2017, 24).

While there is a growing amount of literature focusing on conflict in CG (Ulibarri 2024; Koebele and Crow 2023; Weible and Heikkila 2017), scholarship offers mixed results regarding how CG shapes conflict and vice versa (Lubell et al. 2020; McLaughlin et al. 2022; Ulibarri 2024; Koebele and Crow 2023). In particular, when CG is broadly inclusive and associated with "hot button issues," Lubell and colleagues (Lubell et al. 2020; Mewhirter et al. 2019; McLaughlin et al. 2022) show CG is associated with greater conflict when planning is more collaborative and less hierarchical. Additionally, Ulibarri (2024) shows CG is associated with greater conflict as more viewpoints are included and must be resolved. Finally, Koebele and Crow (2023) show CG can negotiate agreements despite strengthening belief divergence and increasing conflict in multi-decade forums. While conflict is observed, these results highlight that conflict is not directly and consistently associated with positive or negative results.

Along these lines, CG scholars acknowledge that not all conflict is bad, as conflict and disagreement in CG may be constructive (Emerson and Nabatchi 2015; Heikkila and Gerlak 2019). Furthermore, recent empirical work shows that small amounts of conflict can have positive effects on future behavior in collaboration, whereas larger amounts can be detrimental (Ambrose and Siddiki 2024). Yet, no studies to the authors' knowledge evaluate how conflict is associated with the outputs of the collaborations.

Proposition 3. *Topics more associated with conflict are less likely to be converted to annual objectives representing topic prioritization.*

As stated above, CG arrangements are presented as fora in which diverse stakeholders can candidly state their interests and gain exposure to new or different information which can improve individual understanding of policy problems and solutions. This, in turn, may foster constructive collective decision-making (Ostrom 1990; Jenkins-Smith and Sabatier 1994; Sabatier and Weible 2019). While the validity of the information might be challenged and debated (Innes and Gruber 2005; Sabatier and Weible 2019), presenting and exchanging information is central to the collaborative process (Emerson and Nabatchi 2015; Ansell and Gash 2008; Ostrom 1990). In this way, while communication associated with policy conflict and concord is expected to be important to the prioritization and advancement of interests, a significant proportion—if not a majority—of communication might be expected to orient around information exchange, comparatively value neutral in comparison to concord or conflict communication. Thus, three values of discussion are identified in CG arrangements: conflict (value negative), concord (value positive), and information exchange (value neutral).

3 | Case Study: A State EJ Council

EJ is defined by the U.S. Environmental Protection Agency as "the fair treatment and meaningful involvement of all people

regardless of race, color, faith, national origin, or income, in the development, implementation, and enforcement of environmental laws, regulations, and policies" (U.S. EPA 2021). Public and government attention to EJ has grown since Executive Order 12898 was passed in 1994 (Petersen et al. 2006), resulting in attention across all levels of government in the United States (Grafton et al. 2015). The growing prevalence of publicly mandated EJ councils at different levels of government represents a formalized response to EJ (Grafton et al. 2015) created through policies, such as executive orders, legislation, or regulation, which specifically identify key aspects of their design, such as stakeholder composition, duties, and requirements for a minimum number of meetings in a year. Thus, EJ councils are formal venues, compared to other forms of collaborations observed in the environmental domain, such as citizen climate juries (Ross et al. 2021) and community-based collectives (Petersen et al. 2006). The mandates structuring EJ councils also typically define the topics the councils are meant to address, but typically these topics are related to climate change planning, disaster management, reduction of pollution in overburdened communities, equitable conservation and public land use, clean energy transitions, sustainable infrastructure, and civil rights.

Two aspects make EJ councils a good case for this project. First, given the diverse actors brought to the EJ council's "table," we might expect the interests held by those individuals to be equally diverse resulting in potential disparities between the interests communicated in the meetings and those that are prioritized as outputs (i.e., advanced to annual objectives of the council). Second, given these diverse interests, the process of deliberation, and issue prioritization, there is a reasonable chance of observing conflict and concord within the council. As such, their broad mandates, diverse descriptive representation, and discretion to identify their own collaborative outputs make EJ councils a suitable case to observe the dynamics of issue prioritization through a lens of representation.

4 | Methods

4.1 | Data Collection

This study represents a single-case study design, which evaluates an EJ council publicly mandated at the state level by the state's legislature. While the structure of this council is like other state-level EJ councils—with respect to purpose, structure, and duties—a single case is presented here given the data availability needed across the project. The remainder of this section describes the data used in our study.

The mandate of the council defines key aspects of the council's structure and process. It identifies the descriptive representation of the council, identifying 12 appointed citizen members and eight government agents. For appointed citizens: two members represent affected communities, and 10 members represent various public interests (e.g., non-profits, business, local governments). The government members are made up of six state agency heads or their delegates (i.e., Department of the Environment, Department of Health and Mental Hygiene, Department of Housing and Community Development, Department of Planning, Department of Business and Economic Development, Department of Transportation), a representative from the state senate, and a representative from the state house. While the mandate identifies "agency heads of their delegates," in practice, a delegate from each department was consistently observed and agency heads rarely attend the council's meetings. These 20 positions remain consistent throughout the 8 years of the study, thus, descriptive representation within the council remained consistent from year to year. Furthermore, position turnover tended to be ad hoc rather than aligning with council members' four-year term as stipulated in the council mandate.

While not participating in the council by mandate, a 21st actor is included in the analysis as an additional government actor—the staff liaison, who is always present and engaged in the meetings. Our analysis also accounts for council guests that attended meetings. Nine external actor types are tracked in the meeting minutes—a second state council often collaborating with the EJ council, academic/university affiliated, business, citizens, federal government, state government, local government, nonprofit, and state agency. The affiliations of external actors were identified through the meetings minute roll call or through their statements in the meetings minutes. If no clear identification could be made, the actor was identified as a citizen.

The council is mandated to provide advice to the state government and its agencies regarding EJ and related community issues. It requires the council to meet at least six times per year—resulting in consistent observations over the study.

Annual reports for each year of the study sample were collected from the council's website. Two kinds of data were identified from the annual reports. First, for each year, actor names were connected to each member's position identified in the mandate. This linked the names observed in the meeting minutes to the positions the actor occupied—practically, this linked the substantive representation observed in the meeting minutes to the descriptive representation observed in the mandate. Second, annual objectives identified internally by the council at the end of each year were also collected from the annual reports. Each of the objectives in each year was coded to the topics observed in the topic modeling (described below).

Finally, minutes for each council meeting were collected from the council website. Meeting minute documents were originally collected in either PDF or Word processor format and were later converted to a tabular format where each row represented a single statement. A statement, in this study, is defined as an individual sentence captured in the meeting minutes. Manual processing as well as text mining and natural language processing applications in the computer software R were used to transform the data from a prose format to a tabular format. The automated processes were additionally checked manually. Larger sections of the meeting minutes associated with a single actor were subdivided into individual statements since an actor might have differential conflict associated with each statement. For example, an actor might agree that an EJ issue (i.e., topic) is important in their first statement but disagree with the policy instrument suggested to address it in their second statement. These two statements are made by the same actor in a single section of communication and regarding the same topic but are considered separately. While this example conveys an example of concord

and conflict between the two statements of a communication section, all statements are subdivided in a consistent fashion.

To construct the communication dataset across the meeting minutes, the following information was identified for each statement: (1) who made the statement, (2) whether the statement conveyed a form of one-way communication (i.e., announcement) or two-way communication (i.e., discussion with another person, asking of a question, or answering of a question) (Ambrose 2024; Nabatchi 2012), and (3) who the recipient of the statement communicated was (if the statement was identified as reflecting two-way communication). When the speaker of the statement was not clear, the assignment of a speaker to the statement was left blank. Given the richness of the data, 96.6% of statements coded for the council were coded to an actor.

4.2 | Concept Measurement

There are three variables of interest: (1) the *topics of conversation* derived from hLDA topic modeling (discussed in Section 4.2.1), (2) the *concord, information exchange, and conflict* embedded in the communication regarding a topic (discussed in Section 4.2.2), and (3) the *eigen centrality* derived from observed networks in the meeting minutes (discussed in Section 4.2.3). As a roadmap to the discussion below, we offer the conceptual model of our analysis in Figures 2 and 3. We leverage the results of the hLDA model to identify 93 distinct occurrences where a topic was discussed in a given year. These topic-year combinations are thematically matched to annual objectives identified by the council in each year to guide the work of the following year (i.e., the hLDA topic and the annual objective relate to the same policy topic issue). While the annual objectives represent priorities for the following year, the communication networks in the current year represent participation through communication that led to issue prioritization. If there is a match, the topic-year combination is identified as a "success case"; 30 cases altogether became an annual objective. More practically, this operationalization means that the related communication networks are associated with an issue being prioritized. If there is no match, it is identified as a "failure case"; 63 cases altogether did not become annual objectives. These communication networks are associated with an issue not being prioritized.

Using sentiment analysis, we can construct the different levels of our communication network (i.e., concord, information exchange, and conflict) exhibited in all communication in each year. Additionally, a communication network is constructed for each topic in each year. Finally, within the year's full communication networks (collapsing concord, information exchange, and conflict), eigen centrality is calculated to operationalize concepts of core and peripheral members in the council. Each of these concepts is discussed in detail below. Additionally, in Section 4.3, the multi-group MR-QAP and the K-Means Clustering analysis are discussed.

4.2.1 | hLDA Topic Modeling

Topic models are meant to reduce the dimensionality of complex communication by clustering semantically similar communication into groups, identifying overarching topics observed in or across texts (Grubert and Siders 2016). These topics are derived from probabilistically linked co-occurrences of words within texts. As groups of words are more frequently observed together within and across texts, words become associated with the same emergent topic. hLDA modeling is one approach to topic modeling.

We, first, discuss an important modeling choice. In hLDA terminology, a "document" is the unit of analysis in which

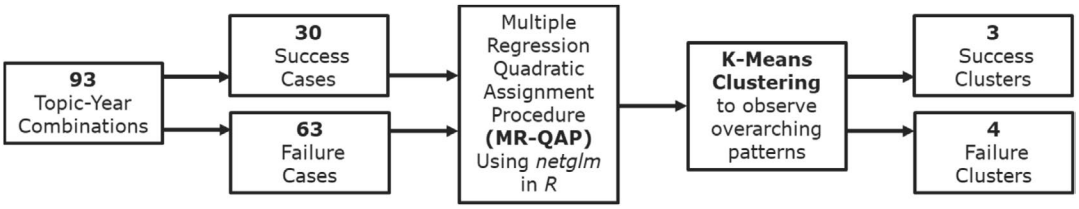

FIGURE 2 | Conceptual framework.

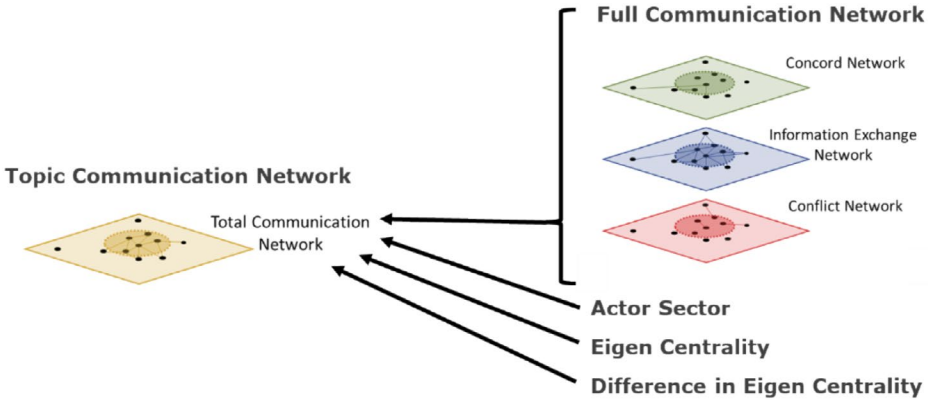

FIGURE 3 | Multi-group MR-QAP modeling framework. [Color figure can be viewed at wileyonlinelibrary.com]

TABLE 1 | Example of hierarchical topic assignment.

	Participant name	Other participant referenced	Statements
1	Part. #1		The Vice Chair of the commission gave an overview of the Executive Summary of the report introducing all of the stakeholders involved in the report.
2	Part. #2	Part. #1	Asked, why is this report coming to the commission?
3	Part. #1	Part. #2	Said because stakeholders have asked the council for advice and recommendations on how to integrate environmental justice and equity into their consideration for the Act, and the report helps do that
4	Part. #2	Part. #1	Said the report was way too long and lengthy
5	Part. #1	Part. #2	The strategies in the Act are good for the community and could create about 37,000 jobs by 2020
6	Part. #2	Part. #1	I disagree. The fact of the matter is jobs will be created but how do we get them to the folks that are systemically are under unemployed and the people who transitioning from extracted industries get other jobs
7	Part. #3	Part. #2	These recommendations don't make sure that we aren't displacing people to really creating opportunities in this new green economy and it's only going to happen if we are thoughtful and sit down with our stakeholders and think about how that could happen

Note: Blue text: Level 1—Overarching level 1.1; Green text: Level 2—Overarching level 2.1; B Red text: Level 3—Cumulative impact of vulnerable populations.

the contained words probabilistically determine the topic of the document (Blei et al. 2010). Stated differently, while the words within a document are used to assign a document to a topic, the document unit is what is being assigned. For this reason, choosing the correct "document unit" is important to our analysis. The full meeting minutes are too coarse, as multiple topics are naturally discussed but only one topic would have been assigned. The statement level is too fine, as semantically important cues are lost when statements are observed in a vacuum. For example, in Table 1, Statements #5 and #6 are naturally linked as one reads the meeting minutes. Yet, if the statements were input to the model as separate units, no mention of "the Act" is made in Statement #6, where the discussion focuses on specific components of the Act. Only while in conversation are these statements able to inform the broader topic being discussed.

Therefore, we utilize a "conversation-level" unit in the model. Conversations were constructed by identifying each one-way communication statement and including all two-way communication observed following it until a new one-way communication statement was observed—the statements in Table 1 are an example of such an aggregated conversation. Where multiple one-way communication statements were made in a row, statements were aggregated based on speakers and topic similarity. Finally, all aggregating to the conversation-level was manually checked to guarantee aggregation matched original breaks in the meeting minutes.

Given this procedure, there are three reasons why hLDA modeling was used. First, as discussed above, hLDA models identify topics at the document level through two levels of estimation: (1) assigning words to latent topics and (2) assigning documents to the same latent topics (Blei et al. 2010). This allows us to identify a dominant theme within each conversation. Second, the hLDA approach is a generative probabilistic model, meaning the number of topics is not externally specified (as in other topic modeling approaches), but randomly identified at each step of the model where a probabilistic fitting procedure is used to determine the goodness of fit at each step (Blei et al. 2010). This allows, we argue, for better fit as it is driven by the data, not by external choices made by the researcher.

Third, the hierarchical nature of the model allows for a structured way for examining overlapping words used across topics. More specifically, the top level of the hierarchy includes words most common and meaningful across all conversations. While procedures used elsewhere remove overly frequent words, these words become computationally important in domain-specific discussions. By removing these highly relevant words (e.g., the commission's name, the state's name, EJ, issue, and community), structurally important semantic linkages across topics are lost. The hLDA procedure retains these words, while leveraging additional semantic variation. Thus, lower levels represent less overlap between topics and thus increasingly solidified and distinct topics. More practically, this allows us to leave the most data (i.e., words in their original, communicated structure) in the model, while allowing more specific topics to emerge. The results of the hLDA model are outlined in Table A1 in Appendix A. The parameters of the hLDA model were optimized, resulting in a coherence score of 0.462, which is well within the acceptable limits identified in the literature.

4.2.2 | Eigen Centrality Measures

The next analysis undertaken focuses on the actor's position in the full communication network each year. Thus, eigen centrality is operationalized to measure if actors are core or peripheral actors in the full communication network. Eigen centrality measures the number of statements an actor makes to other actors, weighed by the number of statements the receivers make themselves. For example, Actor A and Actor B have made 10 statements each to 10 different individuals. Actor A's statement receivers make no statements themselves; thus, Actor A's eigen centrality is weighted down because these actors are inactive themselves. In contrast, Actor B's statement receivers each make 10 statements themselves, weighting up Actor B's score since each of these actors is highly active themselves. When an actor's eigen centrality value increases, the actor can be seen as core to the council's overall communication, as s/he makes many statements and is making statements to actors who are active themselves.

The eigen centrality measure used in this study is calculated with the full communication network. This means that its use in the model is an operationalization and evaluation of proposition 2. For example, if eigen centrality is positive and statistically significant, the topic's conversation is more intensively driven by members core to the council in that year; whereas if it is negative, members peripheral to the council's full activity are more intensively engaging on the topic. We expect that topics discussed more intensively by core members (i.e., high eigen centrality) are more likely to be successful, as they are better able to leverage their relationships to advance their interests.

4.2.3 | Concord, Conflict, and Information Exchange

The next analysis focuses on conflict and concord embedded in communication between council members. Thus, all announcements (i.e., instances of one-way communication) are dropped from the dataset, as they do not represent a direct link between actors. The sentiment for each statement was calculated using the R package *sentimentr* (Rinker 2017), which has several advantages compared to other sentiment packages. Most specifically, *sentimentr* uses weighting from valence shifters to augment the evaluation of dictionary evaluations of sentiment. These valence shifters effectively reverse, increase, and decrease the sentiment of the dictionary words more accurately reflecting semantics in speech (Naldi 2019; Rinker 2017). Further justification for the use of *sentimentr* can be found in Appendix B. For this study, the standard dictionary associated with *sentimentr* was iteratively refined to better fit the discussion within the data sample. One additional advantage of the scores calculated by *sentimentr* is that they are constrained between −1 and 1.

While *sentimentr* was used to calculate the magnitude of positive or negative sentiment of two-way communication (i.e., Conflict Severity), additional coding was required. This coding identified the type of conflict (*Conflict Type*) and an integrated measure of *Conflict Type* and *Conflict Severity* (*Conflict Intensity*). *Conflict Type* is coded in trinary terms (−1:0:1), denoting disagreement, neutrality, or agreement with the referenced speaker in the meeting minutes. The referenced speaker is often the prior speaker. However, at times, it is a different actor, as statements can reference information and/or a statement non-contiguous in the data table (i.e., actors returning to a point made earlier in the conversation). The coding of *Conflict Type* directly interacts with *Conflict Severity*, resulting in the measure of *Conflict Intensity*. *Conflict Intensity* can be understood as the magnitude of sentiment calculated using *sentimentr*, where the sign aligns with the trinary coding of conflict, as it engages a single actor's sentiment score for a single statement and their level of agreement with the referenced speaker.

In Table 2, one can see a practical example of the conflict coding used in this study. First, *sentimentr* calculates Statements #3 and #5 to be positive in conflict severity regarding the Act report, whereas Statements #4, #6, and #7 are negative in conflict severity. In contrast, conflict intensity represents the relational conflict between actors. For example, in Statements #6 and #7, two linked actors make statements negative in conflict severity (i.e., they have negative sentiment towards the Act's report), and thus Statement #7 has a positive conflict intensity as Statements #6 and #7 agree in sentiment towards the topic. Furthermore, the sign of conflict intensity is solely related to conflict type. For example, in Statement #6, conflict intensity is negative as Participant #2 conflicts with the linked speaker (i.e., Participant #1); whereas in Statement #7, conflict intensity is positive as Participant #3 agrees with Participant #2.

For this study, statements with negative conflict intensity scores are included in the conflict network, statements with a score of zero are included in the information exchange or neutral network, and statements with positive scores are included in the concord network. These networks are utilized to evaluate proposition 3. We expect topics where the conflict network is statistically significant, positively correlated, and large in magnitude to be failure topics; whereas we expect topics where the concord network is statistically significant, positively correlated, and large in magnitude to be successful topics. This would suggest that topics more associated with overall conflict are less likely to be converted to annual objectives.

4.3 | Analytical Approach

4.3.1 | Multi-Group Multiple Regression Quadratic Assignment Procedure Modeling

To model the dynamics above across all 93 topic-year combinations observed in the case's meeting minutes, a Multi-group Multiple Regression Quadratic Assignment Procedure (multi-group MR-QAP) was used. MR-QAP analysis is used to calculate the likelihood of dyadic observation given other networks and actor attributes for a single observation. Multi-group MR-QAP allows for the evaluation of multiple network cases in one evaluation with the utilization of block diagonal comparisons.

Three factors are regressed on the outcomes of interest—communication networks for each topic-year combination. First, the interdependence of concord, information exchange, and conflict in the overall communication network in the observed year of the topic-year combination is evaluated. Second, matrices identifying the senders' sector are added. A binary matrix (where 1

TABLE 2 | Example of the tabular formatting from the EJ council.

	Participant name	Other participant referenced	Statements	Conflict type	Conflict severity	Conflict intensity
1	Part. #1		The Vice Chair of the commission gave an overview of the Executive Summary of the report introducing all of the stakeholders involved in the report.	0	0.000	0.000
2	Part. #2	Part. #1	Asked, why is this report coming to the commission?	0	0.000	0.000
3	Part. #1	Part. #2	Said because stakeholders have asked the council for advice and recommendations on how to integrate environmental justice and equity into their consideration for the Act, and the report helps do that.	0	0.200	0.000
4	Part. #2	Part. #1	Said the report was way too long and lengthy	−1	−0.472	−0.472
5	Part. #1	Part. #2	The strategies in the Act are good for the community and could create about 37,000 jobs by 2020	0	0.390	0.000
6	Part. #2	Part. #1	I disagree. The fact of the matter is jobs will be created but how do we get them to the folks that are systemically are under unemployed and the people who transitioning from extracted industries get other jobs.	−1	−0.739	−0.739
7	Part. #3	Part. #2	These recommendations don't make sure that we aren't displacing people to really creating opportunities in this new green economy and it's only going to happen if we are thoughtful and sit down with our stakeholders and think about how that could happen	1	−0.377	0.377

identifies the actor to the sector) is added for actors identified as agency delegates, appointed citizens, external actors, and the staff liaison. Third, for each year, a matrix is added identifying the senders' eigen centrality score as a measure of their core or peripheral status in that given year's total communication network. Finally, a matrix is added to identify the absolute difference in eigen centrality between each sender and receiver pair. This is added to evaluate the likelihood of core-peripheral engagement (if the estimate is positive) or if the communication focuses on core or peripheral actors only (if the estimate is negative).

4.3.2 | K-Means Clustering

Finally, the goal is to examine emergent patterns across the 93 topic-year combinations in the study sample. While this is partially achieved by the multi-group MR-QAP, the results show that clustering all success and failure cases together results in noisy estimations (results and discussion in Appendix C). Practically, this makes sense, as the advancement of interests in collaboration should not be expected to occur via one process or pattern (Emerson and Nabatchi 2015; Agranoff and McGuire 2001; Bryson et al. 2015). Given the complexity of the collaborative process, we might expect multiple patterns of interest advancement. When forcing the data from multiple processes into one equilibrium, we can expect measurement error leading to the noisy estimates of Appendix C. As such, a K-Means Cluster Analysis is used to aggregate similar results when MR-QAPs are run for each topic-year combination results individually. After clusters are identified, multi-group MR-QAPs are run for each cluster, resulting in more precisely estimated associations. This practically allows us to identify and estimate these divergent and discreet patterns independently (Miller and Page 2009). As such, we are able to discuss the multiple processes by which interests can succeed or fail in advancement—an exercise which more closely reflects the process of interest advancement in practice.

To conduct the K-Means Cluster Analysis, a new dataset was constructed where each column represented an objective, and each row represented an estimate from the individual MR-QAP models. The estimates of all statistically significant results (i.e., $p < 0.1$) from the MR-QAP models across all 30 success cases and all 63 failure cases were included in their respective positions; whereas all non-statistically significant estimates were replaced with zeros, as they were non-detectable from zero.

5 | Results

5.1 | Topic Modeling and EJ Topics Observed

Because the topics were mapped back to their respective conversations in the meetings minutes using the hLDA procedure, the participation specific to each theme can be mapped across each year. Figure 4 depicts the number of statements made on each topic in each given year (i.e., the blue line) as well as the number of actors who made at least one statement on each topic in each given year (i.e., the gray bars). The red vertical lines represent years where topics were identified as annual objectives at the end of the year. Broadly, as more actors engage in a topic, there are a greater number of total statements made. For example,

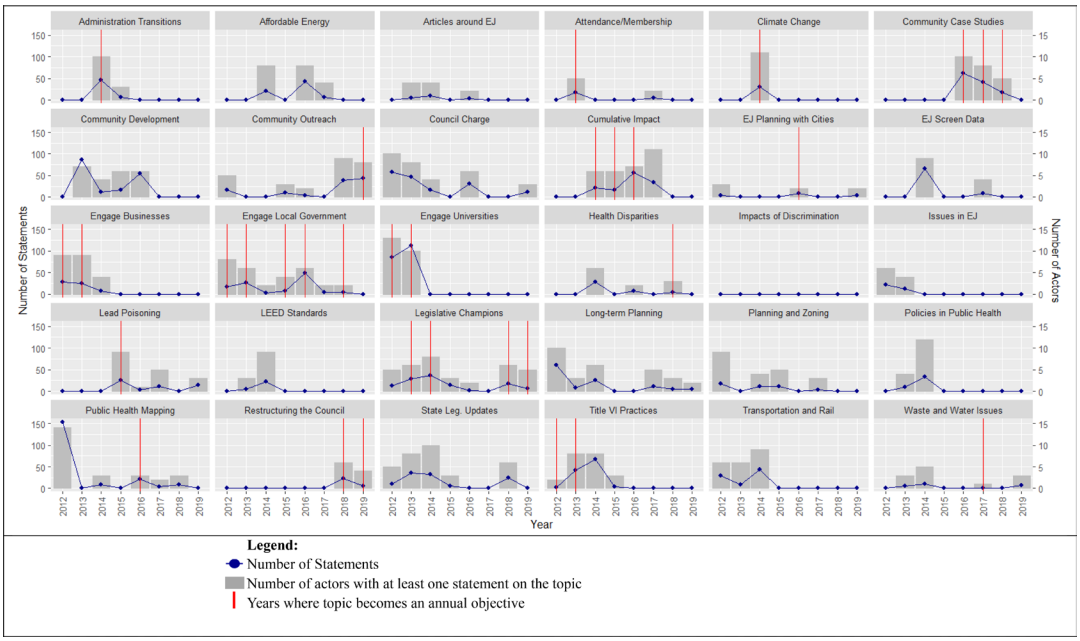

FIGURE 4 | Patterns of participation through communication by topic and year. [Color figure can be viewed at wileyonlinelibrary.com]

consider the *community case studies* topic in the years 2016, 2017, and 2018. Yet this is not always the case—for example, for the *engage universities* topic in the years 2012 and 2013, the number of actors engaging in the topic decreases, but the number of total statements increases. Additionally, this trend does not hold across topics. For instance, the *climate change* topic in 2014, the *council charge* topic in 2012, and the *engage universities* topic in 2013 have 11,10, and 10 actors engaging at least once, but 28, 53, and 113 statements, respectively. Yet, it is the first and the third that become annual objectives.

In Figure 4, one can see a large variety in communication intensity resulting in successful cases. Additionally, there are cases, such as *public health mapping* in 2012, with very high communication intensity that are failure cases. As such, the multi-group MR-QAP analysis is useful for engaging additional qualities of this communication in addition to the communication intensity.

5.2 | Clustered Success and Failure

Table 3 represents the multi-group MR-QAP results for the three success clusters identified by the K-Means procedure. It is clear there are multiple network equilibria, which result in three distinct patterns emerging from the data. First, the associations between the Concord and Neutral Communication Networks and the topic-specific networks are statistically significant across all clusters. Furthermore, the conflict network represents a statistically significant correlation with the topic-specific networks of Cluster #2 and #3. The magnitude of the conflict network estimate is smaller than the concord network estimate, suggesting a stronger association with concord communication over conflict.

Table 3 also highlights the sectors and positions (i.e., core or peripheral) associated with successful topics. More specifically, Clusters #2 and #3 are estimated to have statistically significant associations with core government delegates, core appointed citizens, and core external actors, suggesting the importance of broad participation of core members across sectors. In addition, Clusters #1 and #2 represent statistically significant associations with the staff liaison, suggesting their important role. Only Cluster #2 is associated with the staff liaison and broad core member engagement; whereas, Cluster #1 is represented by the staff liaison and Core Appointed Members only, and Cluster #3 is represented by broad core member engagement but not the staff liaison. Finally, across all success clusters, as the difference in eigen centrality increases, it is less likely that communication is observed between actors. Practically, communication is less likely between core and peripheral members, again highlighting the role of core members in successful cases.

Table 4 represents the multi-group MR-QAP results for the four failure clusters. First, most of the cases—44 of the 63 cases—fall into Cluster #3, where estimates are precisely estimated but small in magnitude across concord, neutral, and conflict networks. This weak correlation with the overall communication networks suggests low communication intensity, reflecting the descriptive results of failure cases in Figure 4.

When considering Clusters #1 and #4, three things become apparent. First, the association between the conflict network and the topic network is greater in magnitude than the association with the concord network, suggesting a stronger correlation with conflict communication than concord. This represents the opposite pattern observed in the success cases. Second, the staff liaison estimate is still statistically significant in Clusters #1 and #3, but the magnitude is now negative, suggesting a reduced role of the staff liaison in these topics. Finally, the broad engagement of core members is only observed in Failure Cluster #3, suggesting the diminished role of core members across all sectors in failure clusters.

The results of Cluster #2 are largely left out of the results discussed above, as these results are different from the other failure clusters. First, the estimates for the association between the

TABLE 3 | Cluster of successful cases—multi-group MR-QAP results.

	Cluster #1		Cluster #2		Cluster #3	
Term	**Estimate**	***p***	**Estimate**	***p***	**Estimate**	***p***
Intercept	0.040	0.353	0.012#	0.066	0.019#	0.063
Concord network	0.499***	0.000	0.147***	0.000	0.576***	0.000
Neutral network	0.049*	0.022	0.025**	0.003	0.240***	0.000
Conflict network	−0.014	0.393	0.113***	0.000	0.367**	0.002
Government delegate	−0.062	0.357	−0.062	0.133	0.043	0.478
Appointed citizen	−0.051	0.301	0.004	0.438	−0.066	0.270
External actor	0.000	0.413	−0.034	0.227	−0.095	0.260
Staff	0.600*	0.019	0.210*	0.015	0.069	0.350
Core government delegates	0.418	0.116	0.284***	0.000	0.300*	0.046
Core appointed citizens	0.403*	0.032	0.162*	0.016	0.826**	0.002
Core external actors	0.153	0.329	0.329*	0.018	0.915*	0.014
Core to peripheral communication	−0.163**	0.003	−0.059**	0.001	−0.148*	0.034
n	4		18		8	

#β < 0.10, *β < 0.05, **β < 0.01, ***β < 0.001.

concord and conflict network and the topic networks are statistically significant but negative in magnitude. This is the only case, across success and failure cases, where this is observed. Meanwhile, the neutral network estimate is statistically significant and positive. Taken together, this suggests these topics are largely associated with information exchange.

6 | Discussion

First, we are only able to partially confirm proposition 1, which states: topics discussed more intensively within collaborative processes are more likely to be converted to annual objectives representing topic prioritization. Our results suggest greater amounts of communication seem necessary, but insufficient, for topic prioritization, since extremely low total communication—the characteristic that defines Failure Cluster #3 and many of the failure cases identified in Figure 4—is strongly associated with the failure to convert a topic into an annual objective. This aligns with rich literature on issue attention (Kingdon 1984; Jones 2001; Simon 1950) and issue competition (Fischer and Leifeld 2015; Koski et al. 2018). While CG arrangements are often poised as venues for integrating and advancing diverse viewpoints (Emerson and Nabatchi 2015; Innes and Booher 2003), actor interests are often interdependent but divergent. This leads to issue competition, where all problems cannot be addressed (Sabatier and Weible 2019; Emerson and Nabatchi 2015). With little attention, potentially driven by the perceived lack of issue severity or interest, leading to underdeveloped communication networks, an issue is expected to fare poorly in this competition.

While attention is necessary to compete against other issues, it is not sufficient to guarantee conversion to an annual objective. Failure Clusters #1 and #4 have similar magnitudes of association across concord, neutral, and conflict networks to those included in the success cases. Furthermore, one can observe in Figure 4 that topics with the greatest participation (across both numbers of actors and number of statements observed) fail to be converted into annual objectives, such as *public health mapping* 2012, *council charge* 2012, and *community outreach* 2018. In these cases, there is attention to the issue, but prioritization does not occur.

One explanation is the "right" actors must participate for a topic to become an annual objective. The results from success Clusters #2 and #3 suggest that broad engagement of core members across sectors is important to topic prioritization—supporting proposition 2. In contrast, when examining the failure cluster results, the engagement of core members is not observed across all sectors outside of failure Cluster #3. Taken together, these results suggest that intensive engagement by one sector's core members alone is not sufficient to advance topics to the annual objectives. This highlights the importance of broad deliberation across sectors (Mewhirter et al. 2019), which is often advocated for in CG theory (Emerson and Nabatchi 2015; Ansell and Gash 2008; Bryson et al. 2015), as well as the importance and influence of core members in such groups (Koski et al. 2018; Ambrose 2024).

It is also important to note that the lack of core member engagement (i.e., the more intensive engagement of peripheral members) is a common trend across failure cases, suggesting an increased difficulty of peripheral members to advance individual topic priorities. While literature suggests that knowledge experts can be important to advancing specific interests despite their peripheral status (Weible 2008), these dynamics are not observed. Our methodological approach should allow these dynamics to emerge. Yet, when core estimates across sectors become small or even negative, they also become statistically insignificant, suggesting peripheral domain experts

TABLE 4 | Cluster of failure cases—multi-group MR-QAP results.

	Cluster #1		Cluster #2		Cluster #3		Cluster #4	
Term	**Estimate**	***p***	**Estimate**	***p***	**Estimate**	***p***	**Estimate**	***p***
Intercept	0.062	0.309	0.009	0.210	0.015*	0.019	0.012#	0.081
Concord network	0.186*	0.032	−0.087**	0.004	0.098***	0.000	0.473***	0.000
Neutral network	0.371***	0.000	0.306***	0.000	0.029***	0.000	−0.012	0.120
Conflict network	0.513**	0.005	−0.104**	0.001	0.073***	0.000	0.661***	0.000
Government delegate	−0.731#	0.054	−0.054	0.271	−0.068*	0.034	−0.134	0.112
Appointed citizen	−0.044	0.361	0.002	0.426	−0.028	0.181	−0.126	0.108
External actor	−0.043	0.369	0.043	0.359	0.004	0.495	−0.044	0.315
Staff	−1.838#	0.084	0.323*	0.044	−0.122*	0.028	−0.049	0.418
Core government delegates	2.744*	0.033	0.240#	0.080	0.357***	0.000	0.613***	0.000
Core appointed citizens	0.173	0.301	0.084	0.221	0.248***	0.000	0.887***	0.000
Core external actors	0.606	0.136	−0.087	0.347	0.101*	0.021	0.346	0.100
Core to peripheral communication	−0.286**	0.007	−0.042	0.194	−0.063***	0.000	−0.051	0.134
n	3		6		44		10	

#β < 0.10, *β < 0.05, **β < 0.01, ***β < 0.001.

are not emerging as topic leaders around specific issues in the case. Furthermore, in all success cases, the core to peripheral estimate is negative and statistically significant, suggesting that core and peripheral members have limited communication in successful issues. This further deemphasizes the role of peripheral members in this case compared to the role theory suggests they play (Weible 2008; Koski et al. 2018), suggesting the forum's structure is potentially less conducive to domain experts (Maag and Fischer 2018).

An interesting result emerges when evaluating core member communication: Success Cluster #1 suggests the staff liaison plays an important role in topic prioritization, even when broad core participation is not offered. While proposition 2 places particular emphasis on the role of core members, the success Cluster #1 results compared to failure Clusters #1 and #3 suggest that intensive engagement by the staff liaison could represent a substitution for poor engagement across all sectors' core members. While this may seem counterintuitive to normative ideals of diverse representation in collaborative arrangements, scholars suggest that the influence and power of specific actors are expected if not needed, leveraging their skills and interests to guide the group (Imperial et al. 2016; Agranoff and McGuire 2001) while also acting as bridges to other groups and resources outside the collaboration (Callens 2024; Vangen and Huxham 2003). The staff liaison, in the case observed here, is not a formal member of the council but is given considerable power in setting the meeting agendas and facilitating outside technical experts. Thus, it is unsurprising that the role is associated with successful topic conversion—sometimes overcoming the lack of broad participation by core members.

Results show nuanced support for the final proposition which states: topics more associated with conflict are less likely to be converted to annual objectives representing topic prioritization. First, the results align with the mixed results observed across research regarding how CG shapes conflict and vice versa (Lubell et al. 2020; McLaughlin et al. 2022; Ulibarri 2024; Koebele and Crow 2023), as concord, information exchange, and conflict are broadly observed across success and failure clusters. Furthermore, it also aligns with the acknowledgement by CG scholars that not all conflict is detrimental (Emerson and Nabatchi 2015; Heikkila and Gerlak 2019; Ambrose and Siddiki 2024).

While success Cluster #1 is represented by no estimated association with the conflict network, the topics included in success Clusters #2 and #3 do have a statistically significant and positive correlation with the conflict network. Importantly, in these clusters, the magnitude of the estimate for the conflict network is smaller than the estimate for the concord network. This result supports scholarship that argues that conflict in CG can be constructive (Emerson and Nabatchi 2015; Heikkila and Gerlak 2019), especially when conflict is not chronic (Pondy 1967; Weible and Heikkila 2017; Forsyth 2018; Ambrose and Siddiki 2024). These results are supported by the failure Clusters #1 and #4 where the magnitudes of the estimates for the conflict network are greater than the estimate for the concord network.

In frameworks that suggest that conflict should be avoided, conflict is often considered value-negative and detrimental to collaboration. In contrast, conflict can also be seen as periods of disequilibrium, moving away from routine group interactions (Pondy 1967; Weible and Heikkila 2017; Forsyth 2018) yet fundamental to deliberation, principled engagement, and building shared motivation (Emerson and Nabatchi 2015; Ulibarri 2024). While disequilibrium can become problematic, a group's movement from routine to conflict and back to routine can also be a cycle of innovation and evolution (Kagan et al. 2023; Pondy 1967).

Therefore, there is not a "right amount" of conflict and concord, but, rather, the higher amounts of conflict compared to concord might represent topic defined by conflict disequilibrium.

Failure Cluster #2 represents a unique case which lacks concord *and* conflict, being strongly correlated with information exchange. While information exchange is fundamental to tasks of CG arrangements (Ostrom 1990; Jenkins-Smith and Sabatier 1994; Sabatier and Weible 2019), it is also potentially decoupled from agreement and disagreement. In comparison to the idea that "not all conflict is bad, as successful collaboration will likely experience conflict in deliberation, principled engagement, and building shared motivation" (Emerson and Nabatchi 2015; Ulibarri 2024), arguably the high correlation with information exchange and negative correlation with both conflict and concord leaves conversations that are void of these processes fundamental to collaborative success (Emerson and Nabatchi 2015; Ulibarri 2024).

To offer qualitative support to this line of argument, a review of the meeting minutes offers some suggestions to the dynamics at play. The topics falling into this cluster are often situations where the council is discussing a technical topic (i.e., often technical aspects of agency reports) or updates are given to members (e.g., such as the proceedings of relevant bills in the current legislative session). While some of these cases foster deliberation and debate, some remain technical, where members ask for clarification but do not state a position—in agreement or disagreement. Thus, while there is significant communication, there might not be interest in prioritizing the topics.

7 | Conclusion

Through this study, we examine consistency between substantive representation through communication and substantive representation in collaborative outputs. Stated practically, we examine the link between issues discussed in the CG case and the issues that are prioritized, becoming annual objectives. Our findings show (i) the quantity of communication is a necessary but insufficient variable associated with topic prioritization in CG; (ii) conversations led by core group members across sectors are more strongly associated with prioritization; and (iii) even in success cases, conflict is observed—but conflict can be detrimental when its association is greater than concord.

Here we note limitations of our study that offer avenues for future work. First, while the results presented here support the theory which informs our propositions and complement prior work on core and peripheral membership (Koski et al. 2018; Carboni et al. 2017) and conflict in CG venues (Ulibarri 2024; Koebele and Crow 2023), comparative work is needed, given the limited ability to discuss generalizability here. Furthermore, while the case was selected due to the data availability needs of the method, we acknowledge that the existence of the EJ council is reflective of the context of the state. What spurred the formation of the EJ council (e.g., politics, socio-economic characteristics, or environmental issues), likely also informs the interest, conflicts, and processes evaluated in this study. Second, the analysis is limited to the information conveyed in the collaborative meeting and recorded in the meeting minutes. We acknowledge this does not capture communication outside of meetings. Finally, we are only able to evaluate revealed interests. In other words, there might be a few or many other interests that a member, or the constituents to whom the member is responsible, have which they do not advocate. This represents another discrepancy between the interests that are brought to the table but not communicated, which, given the methods of this study, go unrevealed and unstudied.

Yet, our findings offer practical relevance to two aspects fundamental but understudied in CG. First, the idea of consensus-oriented decision-making is at the root of many CG frameworks (Ansell and Gash 2008; Emerson and Nabatchi 2015; Innes and Booher 2003). However, the difficulties in consensus are exacerbated by important yet competing interests (Provan and Kenis 2008; Jones 2001; Simon 1950). We show the link between the interests represented in communication and those represented in the collaboration's annual objectives is nuanced. First, successful cases were defined by an increased and robust amount of participation across actors (Nabatchi 2012; Ulibarri and Scott 2017; Berardo and Scholz 2010). Additionally, leadership and core members prove to be a major force in steering the collaboration's substantive representation in outputs (Koski et al. 2018; Bryson et al. 2015). This leaves critical questions regarding the consistency or discrepancies seen between representation in communication and outputs, as members of the core group may hold diverse viewpoints but often use their power to constrain the more diverse range of topics held by the peripheral members (Koski et al. 2018; Bryson et al. 2015). More work is needed to explore the specific interests brought by collaborative members and the dynamics of prioritization for those topics over time.

Second, as suggested elsewhere, conflict can be constructive in collaborative settings (Emerson and Nabatchi 2015; Heikkila and Gerlak 2019), but it is chronic conflict that can be detrimental to the prioritization of topics. While more research is needed to explore the specific dynamics, we are able to show that some amount of conflict—likely associated with the deliberation and negotiation fundamental to consensus building and CG—is associated with successful topic prioritization; whereas, topics defined by greater conflict are associated with failed prioritization.

Ethics Statement

The authors have nothing to report.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

All data used in this analysis are publicly available.

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Appendix A

TABLE A1 | Hierarchical Latent Dirichlet Allocation (hLDA) topic results.

ID	Level	Topic	Top 5 words
X1	1	Overarching Level 1.1	Commission_name, state_name, environemntal_justice, issue, community
X2	2	Overarching Level 2.1	State_environmental_health_network, express, group, advocacy, platform
X3	2	Overarching Level 2.2	Intern_program, pesticide, housing, article, research
1	3	Planning and Zoning	Serve, business, representation, community_benefits_bill, permit
2	3	Engage Businesses	Event, chamber_of_commerce, target, business, economic_development
3	3	Policies in Public Health	County, public, ban, waterway, smoking, student
4	3	Title VI Practices	Title_vi, letter, fair, environmental_protection_agency, advocate
5	3	Impacts of Discrimination	Note, impact, act, assistance, discrimination
6	3	Transportation and Rail	Project, community, impact, department_of_transportation, rail
7	3	Engage Universities	Student, university, project, relationship, academic
8	3	State Legislature Updates	Bill, house_bill, testimony, senate_bill, testify, pass
9	3	EJ Planning with Cities	Plan, update, sustainability, goal, office_of_sustainability, redline
10	3	Public Health Mapping	Community, health, comment, public, health_enterprise_zones
11	3	Council Long-term Planning	Retreat, july, location, judiciarys_mediation_and_conflict_resolution_office, topic
12	3	Engage Local Government	Association_of_counties, engage, planning, municipal_league, invite
13	3	Council Charge	Conversation, recognize, charge, justice, testify
14	3	Attendance/Membership	Members, attend, attendee, regularly, specialist
15	3	Legislative Champions	Caucus, briefing, legislator, legislature, tour
16	3	Articles around EJ	Highlight, sustainable, green, award, registry, article
17	3	Issues in EJ	Increase, enroll, health, cancer, electric
18	3	LEED Standards	Leed, standard, building, air, construction
19	3	Community Development	Demolition, development, land, building, equity, protocol
20	3	Administration Transitions	Transition_team, primaries, could, lunch, elect, expose
21	3	Climate Change	Sea, rise, level, champion, reception
22	3	EJ Screen Data	Tool, ej_screen, datum, support, mapping
23	3	Waste and Water Issues	Pollution, curb, national_association_of_clean_water_agencies, waste, bay
24	3	Affordable Energy	Energy, cost, market, inequity, electric, renewable
25	3	Restructuring the Council	Available, duties, influence, pandemic, reporting
26	3	Community Outreach	Outreach, investigate, advisory, collaborate, community
27	3	Health Disparities	Hospital, environment, definition, asthma, control
28	3	Lead Poisoning	Lead, child, water, testing, provider
29	3	Cumulative Impact	Toolkit, recommendation, cumulative, mitigation, mitigating
30	3	Community Case Studies	Case, study, plant, facility, title_vi

Note: Across the columns of Table A1, the identification number given to the topic, the level of the topic in the hLDA model, the thematic name of the topic, and the five most frequently observed words from the topic are presented. In the level 1 topic of the hLDA, the words are important to the domain but are general; thus, they overlap all conversations in the sample. In the level 3 topic of the hLDA model, substantively useful topic results emerge; thus, it is only the topics observed in level three that are further leveraged in the analysis. The thematic names of each topic were derived from the direct model output (i.e., the most frequent words) as well as a qualitative examination of the conversations to which each topic mapped.

TABLE A2 | Example sentences and sentiment scores using sentimentr.

	Example sentence	Sentimentr	bing	Afinn	nrc
1	The proposed policy is perfect.	0.335	1	3	1
2	The proposed policy is completely perfect.	0.469	1	3	2
3	The proposed policy is not perfect.	−0.306	1	3	1
4	The proposed policy is not perfect, but it is still good.	0.283	2	6	2
5	The proposed policy is still good.	0.306	1	3	1

TABLE A3 | Overarching multi-group MR-QAP results.

	Success		Failure	
Term	**Estimate**	***p***	**Estimate**	***p***
Intercept	0.014**	0.005	0.014**	0.003
Concord network	0.283***	0.000	0.125***	0.000
Neutral network	0.096***	0.000	0.070***	0.000
Conflict network	0.108***	0.000	0.155***	0.000
Government delegate	−0.061	0.120	−0.088***	0.008
Appointed citizen	−0.029	0.274	−0.045**	0.009
External actor	−0.057	0.168	−0.022	0.252
Staff	0.118	0.126	−0.063	0.245
Core government delegates	0.411***	0.000	0.421***	0.000
Core appointed citizens	0.372***	0.000	0.325***	0.000
Core external actors	0.584**	0.001	0.328***	0.000
Core to peripheral communication	−0.076**	0.002	−0.060***	0.000
n	30		63	

*$\beta < 0.05$, **$\beta < 0.01$, ***$\beta < 0.001$.

TABLE A4 | MR-QAP results for individual success cases #1.

	2012 Engage universities	2012 Engage businesses	2012 Title VI practices	2012 Engage local government	2013 Attendance/ membership	2013 Engage universities	2013 Title VI practices	2013 Engage businesses	2013 Legislative champions	2013 Engage local government
Concord network	0.122 (0.475)	0.002 (0.322)	0.006 (0.31)	0.096 (0.218)	0.028 (0.363)	0.032 (0.372)	−0.02 (0.157)	−0.007 (0.168)	0.036 (0.311)**	0.015 (0.498)
Neutral network	0.656 (0)***	0.215 (0.008)**	0.029 (0.033)*	0.124 (0.037)*	0.021 (0.332)	0.905 (0)***	0.472 (0)***	0.178 (0.004)**	0.458 (0.002)*	0.319 (0.002)**
Conflict network	0.224 (0)***	0.007 (0.275)	0.002 (0.22)	0.013 (0.213)	−0.009 (0.338)*	0.408 (0)***	−0.009 (0.315)	−0.002 (0.454)	−0.034 (0.033)*	0.019 (0.089)#
Govn't delegate	−0.266 (0)***	−0.027 (0.238)	−0.006 (0.191)	0.022 (0.171)	0.202 (0.042)	0.261 (0.05)#	0.449 (0.001)**	0.275 (0.001)**	0.276 (0.017)**	0.067 (0.095)#
Appointed citizen	−0.392 (0.017)*	−0.006 (0.493)	−0.018 (0.225)	−0.3 (0.001)**	−0.181 (0.112)	−0.423 (0.036)*	−0.09 (0.341)	−0.061 (0.255)	−0.304 (0.002)	−0.139 (0.09)#
External actor	0.254 (0.373)	0.975 (0.071)#	0 (0.474)	−0.057 (0.278)	0.011 (0.399)	0.102 (0.359)	0.387 (0.194)	0.023 (0.348)	0.041 (0.278)	−0.032 (0.38)
Staff	−0.126 (0.297)	0.032 (0.483)	−0.034 (0.07)#	0.023 (0.474)	0.141 (0.246)	0.049 (0.456)	−0.171 (0.204)	−0.009 (0.296)	−0.025 (0.222)	−0.055 (0.251)
Core govn't delegates	−0.004 (0.387)	0.045 (0.43)	0 (0.474)	−0.007 (0.338)	0.014 (0.484)	−0.127 (0.318)	0.058 (0.477)	0.027 (0.432)	0.016 (0.466)*	0.012 (0.478)
Core appointed citizens	2.367 (0.05)#	1.896 (0.069)#	−0.008 (0.214)	1.581 (0.096)#	0.871 (0.173)	1.733 (0.184)	1.373 (0.199)	0.862 (0.09)#	2.356 (0.039)	−0.132 (0.373)
Core external actors	−0.749 (0.274)	−1.666 (0.076)#	0.004 (0.398)	0.34 (0.099)#	−0.053 (0.348)	−0.57 (0.336)	−1.242 (0.176)	−0.084 (0.334)	−0.258 (0.198)	0.32 (0.243)
Core to peripheral com.	0.839 (0.057)#	−0.094 (0.312)	0.162 (0.018)*	0.024 (0.427)	0.261 (0.192)	0.413 (0.184)	1.81 (0.001)**	0.263 (0.089)#	0.351 (0.113)	0.811 (0.015)*
Intercept	0.349 (0.23)	−0.029 (0.487)	−0.016 (0.244)	−0.07 (0.418)	0.028 (0.34)	1.251 (0.161)	−0.198 (0.411)	−0.076 (0.4)	−0.042 (0.437)	−0.16 (0.314)

#$\beta < 0.10$, *$\beta < 0.05$, **$\beta < 0.01$, ***$\beta < 0.001$.

TABLE A5 | MR-QAP results for individual success cases #2.

	2014 Legislative champions	2014 Climate change	2014 Cumulative impact	2014 Administration transitions	2015 Cumulative impact	2015 Engage local government	2016 Community case studies	2016 Cumulative impact	2016 Engage local government	2016 EJ planning with cities
Concord network	0.026 (0.497)**	0.037 (0.5)	0.037 (0.25)	0.043 (0.415)***	−0.001 (0.29)	0.023 (0.204)	0.015 (0.38)	0.021 (0.423)	0.087 (0.323)	0.017 (0.346)
Neutral network	0.302 (0.001)#	0.073 (0.061)#	−0.084 (0.015)*	0.358 (0)	0.21 (0.016)*	−0.184 (0.008)**	0.722 (0)***	0.361 (0.004)**	0.856 (0.002)**	−0.045 (0.181)
Conflict network	0.049 (0.084)**	0.171 (0)***	0.087 (0.002)**	0.005 (0.344)	0.143 (0.003)**	0.217 (0.001)**	0.068 (0.087)#	0.029 (0.164)	0.269 (0.021)*	0.06 (0.079)#
Govn't delegate	0.255 (0.007)	0.136 (0.025)*	0.1 (0.026)*	0.032 (0.244)#	0.194 (0.057)#	−0.034 (0.375)	1.019 (0.002)**	1.267 (0)***	−0.34 (0.15)	−0.009 (0.469)
Appointed citizen	−0.1 (0.237)	−0.141 (0.046)*	−0.144 (0.003)**	−0.167 (0.082)	−0.012 (0.488)	−0.113 (0.02)*	−0.067 (0.405)	−0.097 (0.299)	−0.401 (0.155)	−0.077 (0.289)
External actor	−0.108 (0.326)	0.028 (0.407)	−0.006 (0.453)	−0.105 (0.275)	0.013 (0.416)	0.037 (0.342)	1.505 (0.163)	−2.044 (0.147)	2.163 (0.18)	0.014 (0.386)
Staff	−0.153 (0.216)	−0.047 (0.336)	−0.029 (0.246)	−0.06 (0.265)	0.052 (0.26)	−0.016 (0.236)	−0.167 (0.146)	−0.11 (0.27)	−0.023 (0.21)	−0.006 (0.177)
Core govn't delegates	−0.004 (0.344)	−0.004 (0.433)	0.001 (0.391)	−0.003 (0.35)#	0.005 (0.489)	−0.003 (0.291)	0.028 (0.442)	0.154 (0.298)	−0.659 (0.128)	−0.316 (0.063)#
Core appointed citizens	0.383 (0.262)	0.12 (0.353)	0.999 (0.014)*	1.368 (0.056)	0.158 (0.17)	−0.518 (0.055)#	1.864 (0.187)	−2.225 (0.2)	2.069 (0.233)	0.023 (0.356)
Core external actors	0.334 (0.233)*	0.209 (0.204)	0.004 (0.425)	0.381 (0.1)	0.006 (0.491)	0.524 (0.042)*	−4.912 (0.162)	7.295 (0.124)	−5.526 (0.176)	−0.056 (0.336)
Core to peripheral com.	0.701 (0.044)	0.224 (0.125)	0.147 (0.148)	0.247 (0.177)	−0.009 (0.472)	0.293 (0.126)	1.918 (0.021)*	0.973 (0.031)*	0.018 (0.415)	0.047 (0.315)
Intercept	0.295 (0.248)	−0.07 (0.452)	−0.047 (0.379)	−0.092 (0.411)	0.003 (0.469)	−0.016 (0.372)	−0.057 (0.464)	−0.158 (0.358)	4.191 (0.005)**	2.052 (0)***

#$\beta < 0.10$, *$\beta < 0.05$, **$\beta < 0.01$, ***$\beta < 0.001$.

TABLE A6 | MR-QAP results for individual success cases #3.

	2017 Community case studies	2017 Public health mapping	2018 Engage local government	2018 Health disparities	2018 Legislative champions	2018 Restructuring the council	2018 Community case studies	2019 Legislative champions	2019 Community outreach	2019 Restructuring the council
Concord network	0.02 (0.492)	−0.002 (0.338)	0.01 (0.153)	0.006 (0.296)#	0.012 (0.428)**	0.057 (0.353)***	−0.001 (0.292)	0.001 (0.349)#	0.023 (0.478)*	−0.006 (0.125)#
Neutral network	−0.295 (0.004)**	−0.014 (0.306)	0.029 (0.079)#	0.038 (0.061)*	0.535 (0.001)*	0.789 (0)	0.329 (0.005)**	0.052 (0.064)*	0.596 (0.023)***	−0.042 (0.073)#
Conflict network	0.929 (0)***	0.009 (0.022)*	0.045 (0.004)**	−0.014 (0.023)*	0.059 (0.023)#	−0.014 (0.342)*	0.13 (0.004)**	−0.011 (0.047)*	0.949 (0)*	0.008 (0.094)#
Govn't delegate	0.179 (0.063)#	−0.02 (0.283)	−0.037 (0.03)*	0.049 (0.047)	0.071 (0.064)	0.25 (0.027)*	0.419 (0.002)**	0.126 (0.019)	0.744 (0.013)	0.059 (0.055)
Appointed citizen	−0.074 (0.329)	0.009 (0.356)	−0.044 (0.025)*	−0.027 (0.118)	−0.051 (0.192)	−0.243 (0.016)	0.002 (0.411)	−0.003 (0.499)	−0.098 (0.298)	0.024 (0.163)
External actor	−0.028 (0.347)	0.001 (0.451)	−0.012 (0.189)	0.001 (0.435)	−0.033 (0.239)	−0.151 (0.278)	−0.021 (0.311)	−0.001 (0.403)	−0.225 (0.184)	−0.002 (0.36)
Staff	−0.051 (0.273)	0.077 (0.168)	0.007 (0.361)	0.031 (0.238)	−0.056 (0.136)	−0.06 (0.262)	−0.01 (0.264)	0.007 (0.48)	−0.002 (0.306)	−0.002 (0.238)
Core govn't delegates	−0.045 (0.282)	0 (0.362)	0 (0.293)	0 (0.45)	0.001 (0.398)	0 (0.395)	−0.06 (0.185)	0.001 (0.367)*	0.05 (0.447)	0.045 (0.175)
Core appointed citizens	0.003 (0.482)	0.002 (0.415)	−0.039 (0.141)	−0.004 (0.368)	−0.091 (0.215)	−0.561 (0.119)*	−0.139 (0.228)	0.328 (0.027)#	−0.624 (0.106)*	−0.006 (0.353)
Core external actors	0.032 (0.347)	−0.004 (0.435)	0.051 (0.069)#	0.023 (0.148)	0.102 (0.109)*	1.003 (0.024)*	0.133 (0.132)	0.042 (0.087)	1.169 (0.029)	0.005 (0.413)
Core to peripheral com.	0.511 (0.075)#	−0.107 (0.168)	0.132 (0.062)#	0.027 (0.176)	0.449 (0.022)	0.822 (0.02)	−0.009 (0.483)	−0.012 (0.429)	−0.098 (0.446)	0.024 (0.162)
Intercept	0.505 (0.118)	−0.002 (0.185)	−0.005 (0.268)	−0.007 (0.292)	−0.011 (0.438)	−0.068 (0.423)	1.322 (0.026)*	−0.012 (0.379)	0.356 (0.141)	−0.025 (0.211)

#$\beta < 0.10$, *$\beta < 0.05$, **$\beta < 0.01$, ***$\beta < 0.001$.

TABLE A7 | MR-QAP results for individual failure cases #1.

	2012 Planning and zoning	2012 Issues in EJ	2012 Public health mapping	2012 Long-term planning	2012 Transportation and rail	2012 Council charge	2012 EJ Planning with cities	2012 Legislative champions	2012 Community outreach	2012 State leg. updates
Concord network	−0.01 (0.111)	0.001 (0.33)	0.093 (0.424)	0.148 (0.286)	−0.038 (0.072)#	0.145 (0.379)	0.013 (0.25)	−0.005 (0.255)	0.066 (0.153)	0.007 (0.492)
Neutral network	0.157 (0)***	−0.064 (0.013)*	0.267 (0.068)#	0.398 (0.003)**	0.019 (0.218)	0.201 (0.041)*	0.07 (0.003)**	0.038 (0.081)#	0.082 (0.09)#	0.019 (0.158)
Conflict network	−0.005 (0.288)	0.044 (0.007)**	0.456 (0)***	0.029 (0.218)	0.098 (0.004)**	0.142 (0.002)**	0.001 (0.329)	0.009 (0.12)	0.048 (0.035)*	0.017 (0.047)*
Govn't delegate	0.024 (0.094)#	−0.013 (0.233)	1.487 (0.002)**	−0.1 (0.089)#	0.175 (0.012)*	−0.06 (0.155)	−0.015 (0.059)#	0.039 (0.038)*	−0.066 (0.04)*	0.009 (0.15)
Appointed citizen	0.031 (0.251)	−0.006 (0.497)	−0.313 (0.12)	−0.462 (0.014)*	0.114 (0.125)	−0.46 (0.003)**	−0.042 (0.093)#	0.015 (0.367)	−0.207 (0.019)*	0.031 (0.197)
External actor	−0.032 (0.323)	0.006 (0.46)	−0.795 (0.101)	−2.566 (0.045)*	0.021 (0.499)	−0.066 (0.403)	0.009 (0.417)	0.003 (0.424)	−0.045 (0.264)	−0.009 (0.35)
Staff	−0.027 (0.273)	0.006 (0.456)	−0.181 (0.24)	−0.013 (0.388)	0.021 (0.495)	−0.361 (0.173)	−0.051 (0.132)	0.043 (0.217)	−0.182 (0.094)#	−0.036 (0.164)
Core govn't delegates	0.02 (0.438)	0.022 (0.365)	−0.123 (0.277)	0.014 (0.415)	0.019 (0.49)	−0.002 (0.384)	0.001 (0.429)	0 (0.362)	−0.003 (0.33)	−0.014 (0.235)
Core appointed citizens	0.207 (0.23)	0.05 (0.399)	−2.296 (0.061)#	−4.398 (0.07)#	−0.197 (0.2)	0.668 (0.287)	0.008 (0.396)	0.063 (0.373)	0.125 (0.227)	0.365 (0.073)#
Core external actors	0.135 (0.17)	0.018 (0.288)	1.944 (0.079)#	7.663 (0.038)*	0.055 (0.222)	0.037 (0.317)	−0.017 (0.42)	−0.026 (0.475)	0.04 (0.323)	−0.034 (0.352)
Core to peripheral com.	0.183 (0.094)#	−0.019 (0.401)	0.313 (0.21)	0.186 (0.319)	0.18 (0.158)	2.204 (0)***	0.262 (0.002)**	0.017 (0.379)	1.023 (0.024)*	0.132 (0.134)
Intercept	−0.108 (0.219)	0.471 (0.063)#	1.373 (0.042)*	−0.232 (0.338)	−0.218 (0.209)	−0.296 (0.348)	−0.033 (0.321)	−0.005 (0.444)	−0.094 (0.238)	−0.041 (0.306)

#$\beta < 0.10$, *$\beta < 0.05$, **$\beta < 0.01$, ***$\beta < 0.001$.

TABLE A8 | MR-QAP results for individual failure cases #2.

	2013 Articles around EJ	2013 Council charge	2013 Transportation and rail	2013 Community development	2013 State leg. updates	2013 Issues in EJ	2013 Policies in public health	2013 Waste and water issues	2013 LEED standards	2014 Long-term planning
Concord network	−0.001 (0.299)	0.061 (0.298)	0.003 (0.401)	0.014 (0.38)	−0.002 (0.265)	−0.013 (0.06)#	0.003 (0.46)	0.001 (0.419)	−0.001 (0.376)	0.044 (0.291)
Neutral network	0.081 (0.001)**	0.175 (0.053)#	0.02 (0.148)	−0.249 (0.004)**	0.455 (0)***	0.126 (0.001)**	−0.057 (0.004)**	−0.05 (0.007)**	0.092 (0.001)**	−0.033 (0.284)
Conflict network	−0.008 (0.022)*	−0.047 (0.01)*	−0.009 (0.029)*	0.569 (0)***	−0.059 (0)***	−0.001 (0.495)	0.006 (0.09)#	0.014 (0.029)*	−0.01 (0.019)*	0.097 (0.011)*
Govn't delegate	−0.019 (0.044)*	1.14 (0)***	0.097 (0.004)**	0.067 (0.119)	0.569 (0.001)**	−0.012 (0.257)	0.027 (0.089)#	−0.006 (0.363)	0.013 (0.132)	0.243 (0.004)**
Appointed citizen	−0.001 (0.495)	−0.017 (0.47)	−0.041 (0.164)	−0.135 (0.31)	−0.195 (0.028)*	0.045 (0.139)	−0.014 (0.423)	0.005 (0.42)	−0.014 (0.348)	−0.171 (0.068)#
External actor	0.024 (0.205)	−0.017 (0.418)	0.001 (0.493)	−0.147 (0.315)	0.054 (0.275)	0.01 (0.331)	−0.001 (0.46)	−0.001 (0.425)	−0.019 (0.292)	−0.004 (0.485)
Staff	0.004 (0.457)	−0.119 (0.173)	0.059 (0.19)	0.007 (0.354)	0.022 (0.495)	−0.02 (0.216)	0 (0.385)	−0.001 (0.33)	0.007 (0.464)	−0.03 (0.304)
Core govn't delegates	−0.009 (0.26)	−0.059 (0.253)	0.003 (0.456)	−0.09 (0.239)	0.04 (0.415)	0.099 (0.072)#	−0.052 (0.127)	−0.032 (0.161)	0.03 (0.191)	0.003 (0.396)
Core appointed citizens	−0.227 (0.093)#	2.201 (0.088)#	−0.058 (0.322)	−1.31 (0.177)	1.451 (0.064)#	0.023 (0.391)	−0.004 (0.476)	−0.006 (0.483)	−0.154 (0.201)	0.612 (0.137)
Core external actors	0.224 (0.085)#	−0.403 (0.236)	0.095 (0.222)	1.212 (0.188)	−0.232 (0.24)	−0.063 (0.278)	0.012 (0.363)	0.006 (0.402)	0.15 (0.166)	−0.068 (0.369)
Core to peripheral com.	−0.01 (0.41)	0.376 (0.15)	−0.005 (0.469)	0.112 (0.32)	0.165 (0.156)	0.149 (0.088)#	0.038 (0.195)	0.001 (0.48)	−0.011 (0.39)	0.623 (0.082)#
Intercept	0.098 (0.098)#	0.027 (0.35)	0.02 (0.261)	0.895 (0.125)	−0.002 (0.389)	−0.243 (0.136)	0.78 (0.039)*	0.629 (0.042)*	0.057 (0.173)	−0.09 (0.371)

#$\beta < 0.10$, *$\beta < 0.05$, **$\beta < 0.01$, ***$\beta < 0.001$.

TABLE A9 | MR-QAP results for individual failure cases #3.

	2014 LEED standards	2014 Affordable energy	2014 Articles around EJ	2014 EJ screen data	2014 Transportation and rail	2014 Policies in public health	2014 Health disparities	2014 Council charge	2014 Planning and zoning	2014 Community development
Concord network	0.029 (0.433)	−0.022 (0.073)#	−0.024 (0.109)	0 (0.262)	0.051 (0.288)	−0.027 (0.035)*	0.023 (0.492)	0.021 (0.419)	0.033 (0.262)	0.004 (0.493)
Neutral network	0.26 (0.004)**	−0.005 (0.485)	0.032 (0.199)	0.205 (0.022)*	0.198 (0.017)*	0.074 (0.051)#	0.414 (0)***	0.128 (0.028)*	−0.02 (0.343)	0.01 (0.134)
Conflict network	−0.045 (0.029)*	0.122 (0)***	−0.012 (0.261)	0.279 (0)***	0.101 (0.015)*	0.072 (0.008)**	−0.006 (0.472)	0.075 (0.031)*	0.076 (0.011)*	−0.003 (0.187)
Govn't delegate	0.146 (0.016)*	−0.074 (0.039)*	0.054 (0.123)	0.156 (0.031)*	0.133 (0.052)#	0.189 (0.004)**	0.077 (0.127)	0.138 (0.024)*	−0.012 (0.432)	0.162 (0)***
Appointed citizen	−0.113 (0.127)	0.086 (0.137)	0.093 (0.156)	0 (0.466)	−0.198 (0.02)*	0.104 (0.083)#	−0.089 (0.235)	−0.082 (0.222)	−0.128 (0.059)#	−0.014 (0.344)
External actor	−0.155 (0.255)	0.015 (0.434)	0.645 (0.046)*	−0.14 (0.273)	−0.474 (0.06)#	0.36 (0.03)*	−0.206 (0.274)	−0.089 (0.291)	−0.18 (0.195)	0.009 (0.306)
Staff	0.011 (0.433)	0.209 (0.082)#	0.011 (0.47)	−0.003 (0.4)	−0.049 (0.249)	0.064 (0.338)	−0.078 (0.317)	−0.026 (0.291)	−0.035 (0.269)	0 (0.427)
Core govn't delegates	−0.002 (0.344)	0.084 (0.359)	−0.006 (0.266)	0.084 (0.335)	−0.002 (0.362)	0.054 (0.384)	−0.004 (0.351)	−0.001 (0.337)	0.001 (0.386)	−0.001 (0.293)
Core appointed citizens	−0.764 (0.112)	0.548 (0.094)#	0.871 (0.102)	−0.136 (0.346)	−1.943 (0)***	0.559 (0.075)#	−0.81 (0.143)	−0.118 (0.336)	−0.578 (0.093)#	−0.023 (0.312)
Core external actors	0.769 (0.109)	−0.075 (0.363)	−0.928 (0.048)*	0.444 (0.147)	1.935 (0)***	−0.697 (0.008)**	0.778 (0.136)	0.302 (0.154)	1.072 (0.028)*	−0.01 (0.376)
Core to peripheral com.	0.303 (0.163)	−0.343 (0.078)#	−0.039 (0.352)	−0.116 (0.338)	0.073 (0.304)	−0.143 (0.206)	0.596 (0.1)	−0.01 (0.497)	0.104 (0.269)	−0.008 (0.383)
Intercept	−0.068 (0.377)	−0.215 (0.325)	0.042 (0.186)	−0.162 (0.342)	−0.097 (0.346)	0.035 (0.344)	0.381 (0.202)	0.906 (0.058)#	−0.034 (0.423)	−0.032 (0.274)

#$\beta < 0.10$, *$\beta < 0.05$, **$\beta < 0.01$, ***$\beta < 0.001$.

TABLE A10 | MR-QAP results for individual failure cases #4.

	2014 Title VI practices	2014 Waste and water issues	2014 State leg. updates	2014 Engage businesses	2014 Public health mapping	2015 Planning and zoning	2015 Community development	2015 State leg. updates	2015 Administration transitions	2015 Legislative champions
Concord network	0.125 (0.409)	0.008 (0.437)	0.055 (0.475)	0.007 (0.467)	−0.011 (0.082)#	0.02 (0.203)	0.038 (0.201)	0.012 (0.156)	0.008 (0.216)	0.063 (0.077)#
Neutral network	0.241 (0.049)*	−0.033 (0.077)#	0.3 (0)***	0.019 (0.198)	0.044 (0.026)*	0.26 (0.01)*	0.443 (0)***	0.086 (0.06)#	−0.012 (0.204)	0.081 (0.105)
Conflict network	0.201 (0.006)**	0.06 (0.004)**	−0.036 (0.07)#	−0.001 (0.45)	0.016 (0.045)*	0.09 (0.012)*	0.107 (0.017)*	0.024 (0.079)#	0.123 (0)***	0.52 (0)***
Govn't delegate	0.5 (0.005)**	0.069 (0.028)*	0.208 (0.008)**	0.129 (0.002)**	−0.025 (0.028)*	0.236 (0.035)*	0.629 (0.001)**	0.099 (0.09)#	−0.04 (0.057)#	0.052 (0.154)
Appointed citizen	−0.483 (0.022)*	−0.032 (0.299)	−0.211 (0.026)*	−0.027 (0.301)	0.041 (0.102)	−0.122 (0.001)**	−0.16 (0.006)**	−0.069 (0.013)*	−0.04 (0.071)#	−0.325 (0.002)**
External actor	−0.375 (0.253)	−0.006 (0.367)	−0.163 (0.269)	−0.011 (0.368)	−0.001 (0.48)	0.001 (0.48)	−0.061 (0.177)	0.002 (0.33)	−0.002 (0.215)	−0.004 (0.235)
Staff	−0.328 (0.237)	−0.005 (0.28)	−0.129 (0.242)	−0.026 (0.252)	0.026 (0.256)	−0.001 (0.319)	−0.038 (0.219)	−0.027 (0.189)	−0.016 (0.183)	−0.015 (0.203)
Core govn't delegates	−0.112 (0.307)	−0.068 (0.075)#	−0.001 (0.41)	−0.001 (0.299)	−0.001 (0.231)	0.002 (0.478)	−0.009 (0.339)	0.001 (0.418)	−0.002 (0.282)	−0.006 (0.211)
Core appointed citizens	0.649 (0.274)	−0.036 (0.185)	−0.381 (0.23)	−0.041 (0.321)	0.272 (0.033)*	0.744 (0.034)*	−0.203 (0.229)	0.43 (0.014)*	0.248 (0.018)*	2.382 (0.037)*
Core external actors	1.264 (0.091)#	−0.001 (0.47)	0.571 (0.11)	0.018 (0.33)	−0.001 (0.493)	0.057 (0.092)#	0.71 (0.023)*	0.007 (0.382)	0.003 (0.487)	0.045 (0.23)
Core to peripheral com.	1.514 (0.027)*	0.003 (0.449)	0.978 (0.004)**	0.338 (0.045)*	−0.074 (0.132)	0.018 (0.317)	0.268 (0.182)	0.284 (0.075)#	0.123 (0.102)	−0.024 (0.365)
Intercept	1.283 (0.133)	0.91 (0.03)*	−0.096 (0.479)	−0.029 (0.432)	−0.011 (0.351)	−0.018 (0.34)	−0.028 (0.389)	−0.006 (0.259)	−0.011 (0.293)	−0.053 (0.132)

#$\beta < 0.10$, *$\beta < 0.05$, **$\beta < 0.01$, ***$\beta < 0.001$.

TABLE A11 | MR-QAP results for individual failure cases #5.

	2015 Community outreach	2016 Affordable energy	2016 Council charge	2016 Public health mapping	2016 Community development	2016 Lead poisoning	2016 Health disparities	2016 Articles around EJ	2016 Community outreach	2017 Lead poisoning
Concord network	0.012 (0.22)	0.012 (0.429)	0.012 (0.441)	0.026 (0.14)	0.163 (0.309)	−0.008 (0.159)	−0.013 (0.134)	−0.002 (0.201)	−0.002 (0.17)	0.014 (0.459)
Neutral network	0.956 (0)***	0.676 (0)***	0.166 (0.045)*	0.009 (0.236)	−0.417 (0.029)*	−0.013 (0.108)	0.158 (0.007)**	0.009 (0.027)*	0.009 (0.032)*	0.222 (0.033)*
Conflict network	0.033 (0.054)#	0.009 (0.343)	0.169 (0.005)**	0.133 (0.003)**	0.784 (0)***	−0.003 (0.286)	0.078 (0.012)*	−0.005 (0.016)*	−0.005 (0.019)*	0.028 (0.035)*
Govn't delegate	−0.167 (0)***	0.948 (0.012)*	0.771 (0.003)**	−0.133 (0.013)*	0.96 (0.026)*	0.055 (0.032)*	−0.217 (0.004)**	0.083 (0.005)**	0.083 (0.011)*	−0.048 (0.477)
Appointed citizen	−0.047 (0.101)	−0.055 (0.451)	−0.054 (0.405)	−0.12 (0.008)**	−0.754 (0.03)*	0.037 (0.164)	0.06 (0.143)	0.007 (0.208)	0.007 (0.174)	−0.088 (0.314)
External actor	−0.014 (0.229)	0.051 (0.411)	−0.093 (0.335)	−1.483 (0.102)	0.313 (0.385)	−0.005 (0.345)	0.163 (0.173)	0.002 (0.202)	0.002 (0.19)	−0.546 (0.073)#
Staff	−0.014 (0.24)	−0.363 (0.119)	−0.173 (0.133)	−0.005 (0.182)	−0.063 (0.252)	0.003 (0.374)	−0.004 (0.178)	−0.004 (0.092)#	−0.004 (0.097)#	−0.094 (0.157)
Core govn't delegates	−0.003 (0.302)	−0.197 (0.132)	0.036 (0.359)	0.045 (0.303)	−0.381 (0.172)	0.115 (0.06)#	0.135 (0.136)	−0.001 (0.209)	−0.001 (0.233)	−0.002 (0.417)
Core appointed citizens	−0.09 (0.171)	0.041 (0.466)	−0.154 (0.301)	−2.003 (0.096)#	0.835 (0.389)	−0.011 (0.317)	0.223 (0.167)	−0.001 (0.459)	−0.001 (0.458)	−0.854 (0.071)#
Core external actors	0.144 (0.06)#	−0.255 (0.413)	0.31 (0.241)	5.307 (0.106)	−1.198 (0.409)	0.024 (0.265)	−0.595 (0.134)	−0.006 (0.188)	−0.006 (0.173)	2.449 (0)***
Core to peripheral com.	0.049 (0.248)	3.26 (0.022)*	1.51 (0.023)*	0 (0.5)	0.328 (0.228)	−0.027 (0.213)	−0.02 (0.307)	0.035 (0.035)*	0.035 (0.037)*	0.713 (0.064)#
Intercept	−0.024 (0.311)	1.111 (0.07)#	−0.048 (0.384)	0.034 (0.254)	4.47 (0.002)**	−0.188 (0.047)*	−0.233 (0.054)#	−0.004 (0.315)	−0.004 (0.311)	−0.006 (0.379)

#$\beta < 0.10$, *$\beta < 0.05$, **$\beta < 0.01$, ***$\beta < 0.001$.

TABLE A12 | MR-QAP results for individual failure cases #6.

	2017 Engage local government	2017 Long-term planning	2017 Cumulative impact	2017 Affordable energy	2017 Planning and zoning	2017 EJ Screen data	2017 Attendance/ membership	2018 Community outreach	2018 Public health mapping	2018 State leg. updates
Concord network	−0.001 (0.391)	0.008 (0.49)	−0.003 (0.243)	0.006 (0.402)	0 (0.36)	0.019 (0.324)	0.004 (0.44)	0.044 (0.405)	−0.001 (0.386)	0.001 (0.334)
Neutral network	0.112 (0.023)*	0.065 (0.099)#	1.195 (0)***	0.182 (0.001)**	0.024 (0.175)	−0.053 (0.117)	0.02 (0.125)	0.564 (0.001)**	0.163 (0.014)*	−0.035 (0.289)
Conflict network	−0.007 (0.132)	0.024 (0.039)*	0.033 (0.041)*	0.01 (0.03)*	0.018 (0.024)*	−0.011 (0.116)	0.012 (0.027)*	0.189 (0.009)**	0.027 (0.054)#	0.852 (0)***
Govn't delegate	−0.078 (0.04)*	−0.16 (0.022)*	0.264 (0.042)*	−0.261 (0)***	−0.067 (0.024)*	0.126 (0.083)#	0.419 (0.001)**	0.786 (0)***	0.16 (0.025)*	−0.14 (0.005)**
Appointed citizen	−0.007 (0.495)	0.04 (0.306)	−0.084 (0.234)	−0.043 (0.138)	−0.002 (0.448)	−0.09 (0.194)	−0.019 (0.341)	−0.191 (0.017)*	0.003 (0.458)	−0.006 (0.475)
External actor	0.004 (0.433)	0.07 (0.261)	−0.287 (0.098)#	−0.142 (0.073)#	−0.15 (0.103)	0.042 (0.282)	0.003 (0.463)	0.046 (0.373)	−0.127 (0.128)	−0.036 (0.296)
Staff	0.003 (0.478)	−0.164 (0.115)	0.004 (0.372)	−0.003 (0.224)	0 (0.399)	0.001 (0.362)	0.003 (0.483)	−0.104 (0.169)	0.009 (0.433)	−0.038 (0.214)
Core govn't delegates	−0.067 (0.073)#	−0.019 (0.229)	0.036 (0.301)	−0.001 (0.346)	−0.001 (0.381)	−0.03 (0.22)	−0.001 (0.299)	0.005 (0.42)	0.006 (0.419)	0.006 (0.412)
Core appointed citizens	−0.004 (0.463)	−0.013 (0.396)	−0.468 (0.096)#	−0.233 (0.07)#	−0.254 (0.084)#	−0.024 (0.337)	0.353 (0.005)**	0.308 (0.119)	−0.345 (0.064)#	0.146 (0.165)
Core external actors	−0.006 (0.46)	−0.021 (0.44)	1.381 (0.02)*	0.648 (0)***	0.736 (0.002)**	0.073 (0.2)	−0.026 (0.286)	0.029 (0.403)	0.562 (0.022)*	0.146 (0.173)
Core to peripheral com.	0.002 (0.459)	1.086 (0.006)**	0.06 (0.268)	0.047 (0.134)	−0.004 (0.433)	0.016 (0.401)	0.009 (0.334)	0.847 (0.001)**	−0.067 (0.295)	0.21 (0.086)#
Intercept	0.737 (0.01)*	−0.003 (0.369)	−0.054 (0.332)	0.002 (0.388)	−0.004 (0.243)	0.821 (0.092)#	−0.009 (0.227)	−0.177 (0.328)	0.242 (0.159)	−0.048 (0.433)

#$\beta < 0.10$, *$\beta < 0.05$, **$\beta < 0.01$, ***$\beta < 0.001$.

TABLE A13 | MR-QAP results for individual failure cases #7.

	2019 Long-term planning	2019 Lead poisoning	2019 Council charge
Concord network	0.002 (0.499)	0.061 (0.191)	0.004 (0.467)
Neutral network	0.372 (0.001)**	0.633 (0.017)*	0.154 (0.029)*
Conflict network	−0.033 (0.009)**	0.036 (0.103)	0.197 (0.003)**
Govn't delegate	0.106 (0.018)*	0.694 (0.008)**	0.568 (0.002)**
Appointed citizen	−0.008 (0.436)	−0.263 (0.003)**	−0.019 (0.367)
External actor	0.001 (0.437)	0.064 (0.314)	−0.016 (0.21)
Staff	−0.036 (0.076)#	−0.035 (0.227)	0.003 (0.344)
Core govn't delegates	0.002 (0.454)	0.006 (0.441)	−0.03 (0.173)
Core appointed citizens	0.012 (0.22)	−0.174 (0.249)	0.046 (0.182)
Core external actors	−0.012 (0.334)	0.428 (0.096)#	0.055 (0.141)
Core to peripheral com.	0.394 (0.027)*	0.352 (0.136)	−0.073 (0.223)
Intercept	−0.022 (0.211)	0.591 (0.097)#	0.281 (0.036)*

#β < 0.10, *β < 0.05, **β < 0.01, ***β < 0.001.

Appendix B

Sentimentr

The next analysis undertaken for this paper focuses on conflict and concord embedded in communication between council members. Thus, all announcements (i.e., instances of one-way communication) are dropped from the dataset, as they do not represent a direct link between actors. The sentiment for each statement was calculated using the R package *sentimentr* (Rinker 2017), which has several advantages compared to other sentiment packages. Most specifically, *sentimentr* uses weighting from valence shifters to augment the evaluation of dictionary evaluations of sentiment. These valence shifters effectively reverse, increase, and decrease the sentiment of the dictionary words (Naldi 2019; Rinker 2017). To highlight the importance of this procedure, Table A2 offers example sentences depicting the results of the *sentimentr* package, alongside scores of other prevailing sentiment dictionaries that use counting approaches alone (i.e., *bing*, *Afinn*, and *nrc* packages). This count-based system loses nuance of language captured by *sentimentr*. For example, *sentimentr* captures the amplifier 'completely' increasing the sentiment score between *example #1* and *example #2*. This application is only coarsely captured by the *nrc* package. Between *example #1* and *example #3*, the negator 'not' flips the sentiment's polarity, which is not captured in the other packages. Finally, the deamplifier and negator 'but' decreases the sentiment score between *example #1* and *example #4* but again flipping the sentiment's polarity between *example #3* and *example #4*. This, again, is not captured by the other packages. Within these examples, one can see how *sentimentr* more accurately and robustly captures sentiment when compared to the counting methods of *bing*, *Afinn*, and *nrc*. For this study, the standard dictionary associated with *sentimentr* was iteratively refined to better fit the discussion within the data sample. One additional advantage of the scores calculated by *sentimentr* is that they are constrained between −1 and 1.

Appendix C

Full Success and Failure

Table A3 identifies the multi-group MR-QAP results when all success cases are clustered together, and all failure cases are clustered together. At first examination, it becomes clear that the results for the success and failure cases are broadly similar: statistical significance and magnitudes are shared across the success and failure topics. When clustered across the full samples, success and failure networks are similarly correlated with the Concord Network (success: 0.283; failure: 0.125) Neutral Network (success: 0.096; failure: 0.070), and Conflict Network (success: 0.108; failure: 0.155). Practically, this suggests that the concord, information exchange, and conflict communication are not differentially associated with a topic's likelihood of becoming an annual objective. Similarly, Core Government Delegates (success: 0.411; failure: 0.421), Core Appointed Citizens (success: 0.372; failure: 0.325), and Core External (success: 0.584; failure: 0.328) actors are likely to participate in both success and failure cases. The only differences observed between the models relate to negative associations between Government Delegate (β = −0.088) and Appointed Citizen (β = −0.045) and failure cases. This suggests that actors identified as government delegates and appointed citizens are less likely to engage intensively in topics that fail to become annual objectives. Yet, the magnitude and direction estimated for failure cases are also similar to the success model despite the estimates in the success model not being statistically significant.

Given these results, two interpretations can be given. First, that there is no, or very little, measurable difference between the qualities of communication associated with success and failure. Second, similar estimates are driven by noise within the success and failure cases. Stating this second interpretation differently, there is not one equilibrium that is associated with success and failure but multiple. It is important to remember that significance in MR-QAP analysis is driven by the likelihood of observing correlation against a random permutation of the same network. In other words, estimations can be significant as they are unlikely against a random distribution, but the aggregation of multiple network equilibrium in the same multi-group MR-QAP regress the results to a common "mean" network. While both might be true given the results here, additional analysis can be used to confirm or disprove the second interpretation. Thus, we utilize the K-Means clustering analysis, as an attempt to examine not one pattern of success and failure, as evaluated here, but multiple potential network equilibrium for both (Tables A4–A13).