Policy Studies Journal

ORIGINAL ARTICLE OPEN ACCESS

A Three-Stage Model of the Maturation of Nascent Policy Subsystems Toward Stable Advocacy Coalitions, With Evidence From the UK's Response to COVID-19

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Received: 12 November 2023 | **Revised:** 4 April 2025 | **Accepted:** 2 May 2025

Funding: This work was supported by the Economic and Social Research Council (ESRC), Open Research Area grant ES/V013556/1, "Frames in Production: Actors, Networks, Diffusion (FRAMENET)".

Keywords: advocacy coalition | COVID-19 | discourse network analysis | nascent subsystem | policy beliefs

ABSTRACT

Policy subsystems are comprised of competing advocacy coalitions, in which public and private political actors with shared belief systems learn from each other and coordinate their strategies in the pursuit of influencing policy making in their favor. While numerous studies have focused on the longevity and structural stability of advocacy coalitions, there is scant theory and evidence on how nascent policy subsystems bifurcate into stable, competing coalitions. This article proposes a three-stage model of problem discovery, differentiation, and consolidation. We apply discourse network analysis to the nascent subsystem of the UK's COVID-19 response in order to study these phases and discuss their applicability and implications for other institutional and issue contexts.

1 | Introduction

Policies can be thought of as the product of interactions between political actors who seek to influence a public policy process. These interactions take place in a policy subsystem (McCool 1998; McGee and Jones 2019), which is a space where a variety of policy actors, including public and private organizations, engage in advocacy (Leifeld et al. 2022) to influence the course of the policy process (Jones and Jenkins-Smith 2009). In a policy subsystem, actors form advocacy coalitions around their shared policy beliefs (Sabatier and Jenkins-Smith 1993).

Advocacy coalitions compete in attempts to influence public policies and outcomes (Jenkins-Smith et al. 2014). They are composed of governmental and private actors who share a set of normative and causal beliefs and a non-trivial degree of coordinated activity over time (Sabatier and Jenkins-Smith 1999). In the Advocacy Coalition Framework (ACF), policies are the result of interpretations of beliefs by competing coalitions (Sabatier and Jenkins-Smith 1993). In a typical policy subsystem, two or more coalitions compete to influence public policies and outcomes (Jenkins-Smith et al. 2014). Minor, and rarely major, policy change happens because of changes in beliefs as a result of policy learning within and across the coalitions, sometimes sparked by external events, such as elections or new scientific evidence (Sabatier and Jenkins-Smith 1993; Nohrstedt and Weible 2010). Collective belief changes in a subsystem often have a long time horizon of a decade or more (Jenkins-Smith et al. 1991). It takes up to a decade for a new, or nascent, policy subsystem to become established and mature (Ingold et al. 2017, 445).

While much scholarship has focused on how established advocacy coalitions function, little is known about the process by which nascent subsystems develop into mature subsystems with

well-differentiated and stable coalitions. Sabatier and Jenkins-Smith (1993, 1999) first acknowledged the existence of nascent policy subsystems with fragmented, fluid, and vaguely formulated sets of beliefs but did not explain the transition to well-established beliefs in mature subsystems. Ingold et al. (2017) argue that the structure of nascent subsystems becomes institutionalized through actors' shared deep core beliefs, prior collaborations between actors, and the policy cues provided by influential actors and scientists. Stritch (2015) posits that initially loosely connected advocacy communities are transformed into advocacy coalitions with more strongly differentiated shared beliefs and coordination patterns (see also Gmoser-Daskalakis et al. 2023). This maturation process from "imprecise and widespread policy preferences" toward coalitions with stable belief systems is facilitated by joint forum participation and collaborative links between political actors (Wiedemann and Ingold 2024). When a nascent subsystem grows stable, "the link between issues and instruments converges in different [policy] venues over time" (Lemke et al. 2023).

Despite the acknowledgment of such institutionalization and transformation processes from nascent to mature subsystems, precisely *how* nascent subsystems evolve into mature subsystems with stable coalitions is still an open question. Developing a better understanding of how nascent subsystems mature is an important step in moving the ACF from description toward a full-fledged theory of the policy process. In this article, we contribute to this goal by developing a three-stage model of nascent subsystem maturation from an empirical case study. This represents not only a theoretical contribution and expansion of current ACF theory but also bridges the gap between ACF theory and its empirical application, as the literature highlights the need for more empirical models and common methodological approaches (Henry et al. 2022; Pierce et al. 2022).

To develop this model of nascent subsystem maturation inductively, we conduct an empirical case study of the UK's response to COVID-19. The empirical case study of the UK's response to COVID-19 offers a useful opportunity to examine how a new policy issue fueled the development of a new policy subsystem, thereby laying the foundation for the three-stage model. This case is suitable for developing a theory of nascent subsystems for several reasons. First, COVID-19 presented a new issue around which new actor constellations could develop. Although pandemics were discussed before the emergence of COVID-19 (Galam 2010; Luoma-aho et al. 2013), the severity of the threat to society as a whole and the fact that the debate involved responses beyond epistemic communities made COVID-19 a novel policy issue. There was no significant prior subsystem history. Second, it was a grave and pressing problem and generated an abundance of data points for analysis. Third, the UK as a liberal democracy with a diversified media landscape and a common participation of governmental and non-governmental actors in policy debates (Lyall and Tait 2005) permits the observation of institutionally relatively unrestricted coalition formation.

We observe three stages of coalition formation in this empirical case. In the first stage of our proposed model, the majority of political actors to whom the emerging policy problem is relevant engage in a search for possible solutions to address the new problem. They form one large issue network with a multitude of mutual affirmations even across partisan and functional divides. These affirmations are driven by uncertainty about the new threat and the costs it imposes (Fidelman et al. 2014). Meanwhile, some interest groups with strongly vested interests form smaller protectionist coalitions in the periphery of the network to defend their particular industries or constituencies. We call this the problem discovery phase.

In the second stage of the proposed model, a differentiation both within the solution-oriented issue network and the group of vested interests takes place. Actors in the large component that previously frantically sought ways to deal with the problem now start differentiating into multiple sub-components with diverging beliefs about what solutions work best, taking into account possible trade-offs. At the same time, the previously peripheral interest group coalitions continue to divide into smaller groups, further refining their particular interests around the protection of particular constituencies from policy change. We call this the differentiation phase.

In the third stage of the proposed model, the actors who were recently differentiated into separate components based on different policy solutions start consolidating their policy beliefs by docking onto other compatible solution components as well as vested interests, thereby sorting into two internally homogeneous advocacy coalitions. We call this the consolidation stage of the subsystem, and it immediately precedes the existence of mature advocacy coalitions that are commonly observed in empirical studies applying the advocacy coalition framework.

Advocacy coalitions are composed of at least two layers: The original formulation of the ACF emphasized coalitions based on congruent belief systems (Sabatier and Jenkins-Smith 1993), and subsequent studies added collective action considerations and coordination to the array of activities and characteristics holding advocacy coalitions together (Schlager 1995; Ingold 2011). Recent scholarship finds a "correspondence between ideology (policy core beliefs) and coordinated activity" (Stritch 2015): Advocacy coalitions measured at the level of policy beliefs generally resemble those measured through coordinated activity, with some nuanced differences, reflected in more activity and participation in the policy belief layer of the network (Schaub and Metz 2020). Coordination is typically measured cross-sectionally using questionnaires, making it difficult to measure change over time because retrospective answers are prone to recall bias and repeated interviews are subject to panel attrition due to the burden on interviewees (Coughlin 1990; Finney 1981; Geweke and Martin 2002; Janson 1990; Leeper 2019; Van Der Vaart et al. 1995). In contrast, belief development can be measured longitudinally without requiring actors' conscious acknowledgment of the process. This permits the measurement of changes in beliefs leading to realignment of actors' positions on the issue in the subsystem (Leifeld 2013). We build on this finding and focus on the belief layer as measured through discourse network analysis (DNA) (Leifeld 2017) as a proxy for advocacy coalitions, following recent work analyzing nascent subsystem development using DNA (Lemke et al. 2023; Löhr et al. 2024). DNA combines content analysis and network analysis in the measurement of structural features of policy debates and thus supports a fine-grained temporal measurement of the coalition structure of a subsystem in terms of policy beliefs (Leifeld 2013,

2017; Leifeld et al. 2022). This temporal granularity is advantageous for capturing temporal changes in the evolution of subsystems.

In the remainder of this article, we first discuss the case and data sources, then the methodology of discourse network analysis, then develop the three-stage theory of nascent subsystem maturation by applying discourse network analysis to the case and data and abstracting from the empirical observations, and finally reflect on the general lessons we can draw and the inferential limits of learning about other nascent subsystems from our case study.

2 | Case Study and Data: The UK's COVID-19 Response as a Nascent Policy Subsystem

One of the main challenges with analyzing the development of beliefs in a nascent policy subsystem is the scarcity of new policy issues that would allow observation of how actors form their beliefs on an emerging problem. We chose the case of the UK's response to COVID-19 to study coalition realignment processes in a nascent subsystem.

While pandemics have occurred before, the level of the global response in the form of various social distancing measures enacted to contain the spread of COVID-19 was unprecedented for modern times. Governments around the world needed to act quickly to respond to this imminent threat, making decisions that affected the livelihoods of millions of people, sparking national debates about the best approach to address the issue. Besides posing an imminent threat to societies, the COVID-19 pandemic also offers a unique opportunity to observe actors' attempts to solve a novel problem.

Most nascent subsystems revolve around novel problems which can often be seen as societal threats. When confronted with a policy issue that poses a significant threat to society, actors engage in a search for solutions and build coalitions around the policy beliefs concerning the new threat. For instance, hydraulic fracturing ("fracking") is a case that has been analyzed as a nascent subsystem (e.g., Ingold et al. 2017), though different countries followed different trajectories (Weible et al. 2016). When fracking first emerged on the political agenda, actors did not know much about environmental risks, including water contamination, air pollution, and earthquakes; public health concerns, including respiratory issues and noise and light pollution near extraction sites; climate change due to methane leakage; economic disruption; and impacts on ecosystems. Consequently, many actors first engaged in a search for possible threats and possible ways to contain these threats, in a way that is comparable to a pandemic, albeit at a more localized scale. Hence, COVID-19 is a suitable case in good keeping with the general requirements of addressing an upcoming societal threat about which little information has been generated and a limited policy belief portfolio from which few existing lessons can be drawn when the problem first arises.

The UK case was chosen for analysis for two main reasons. First, the UK is a liberal democracy with a tradition of diverse, open media and the frequent participation of both governmental and non-governmental actors in policy debates (Lyall and Tait 2005). The role of politics in the news media's coverage of COVID-19 renders news media a valuable resource for analyzing public discourse on the subject. Second, the UK's geographical location and the fact that the initial outbreak of the virus occurred in Italy provided a notable delay, allowing actors to frame the issue and discuss solutions that had already been implemented in other countries.

To explain how UK actors formed and developed their beliefs about the best way to deal with COVID-19, we collected and analyzed data from two time points. As the first time point, we selected the period from March 9 to March 22, 2020. The first date marks when Italy announced the introduction of a national lockdown for the entire country. While no event of this magnitude had occurred in the UK by that time, this date marks an important milestone for introducing the idea of regulating the pandemic on a policy level. The second time point marks the time of the introduction of the second national lockdown in the UK, which determined the policy solution that would be implemented, ending the debate about other potential policy solutions at the time. For the second time point, we selected the period from October 14, 2020, when the debate about measures was reactivated by the government's introduction of a regional three-tier system, to November 5, 2020, when the second national lockdown was introduced.

To examine the evolution of actors' beliefs in a nascent policy subsystem, we conducted a media content analysis of three national UK broadsheet newspapers: *The Guardian*, *The Independent*, and *The Telegraph*. We selected these newspapers for analysis because they publish consistently and maintain a steady political orientation, characteristics associated with "high-quality" newspapers (Barranco and Wisler 1999). We chose newspapers with a consistent political stance to cover the full political spectrum: The Guardian representing the left, The Independent representing the center, and The Telegraph representing the right.

To access the newspaper articles, we used the *LexisNexis* database, which contains online versions of newspaper articles published in the UK (LexisNexis 2023). The collected articles encompassed both online and print versions of the newspapers. The Independent only publishes online articles, while The Guardian has both online and print versions, and The Telegraph exclusively publishes print versions of their articles. With technological advancements changing the way news is reported, having access to online versions of the articles is crucial for analyzing actors in dynamic environments where situations can rapidly change in a short time.

News reporting comes with inherent biases (Schmid-Petri 2017). Newspaper editors often interview specific groups of mediagenic actors such as ministers, party and union leaders, and experts, and they seek to amplify conflict. Furthermore, actors may self-censor and make fewer statements if they represent industry interests for strategic reasons or due to uncertainty regarding their perceived popularity of the stated solutions. Yet, newspapers still act as a platform for a variety of actors to share their ideas on how to solve problems with the general public and other actors. Other arenas of the debate each come with their own biases. Newspapers, as a public forum, are especially vital

for non-governmental actors who often have limited access to discussions in internal governmental committees.

In each newspaper article, we looked for instances where COVID-19 was the primary focus of the article. Since the implementation of a national lockdown was a key criterion for selecting data collection periods, we used the search term "national lockdown" OR "stay at home" for both periods if they appeared anywhere in the text. We excluded letters, editorials, and commentaries from the search as we were focused on actors' statements. After the initial search, we selected 415 articles for coding. This search strategy kept the number of false positive newspaper article hits low and the manual annotation effort manageable and made the two time points as comparable as possible while anchoring them both around the focal topic of lockdowns, which marked time periods of acute problem pressure.

We removed all duplicate statements, specifically instances where the same statement was repeatedly made by the same actor within a single article. In the first COVID-19 policy debate, 523 statements from 113 organizations (e.g., companies, parties, associations) were coded in 129 articles. In the second debate, from October 14 to November 5, 2020, 1631 statements from 248 actors were coded in 286 articles. Statements containing concepts that encompass two levels of beliefs (policy core beliefs and secondary aspects) were coded iteratively by analyzing actors' statements in the selected media during the observation period. No distinction was made between different levels of beliefs, that is, policy core beliefs and secondary aspects were coded together. These types of beliefs were coded together because the advocacy coalition framework acknowledges the theoretical and analytical overlap between the two belief categories. First, Sabatier (1998, 103–104) argues that "policy core beliefs are the fundamental 'glue' of coalitions because they represent basic normative and empirical commitments" while secondary aspects "comprise a large set of narrower (i.e., less than subsystem-wide) beliefs concerning [...] policy preferences regarding desirable regulations". From this distinction, it seems both the subsystem-wide core beliefs, which structure coalitions, and the more narrow secondary aspects are relevant because both express what policy solutions different types of actors, both those with vested interests and those interested in the entire subsystem, contribute to the policy debate. Second, Sabatier (1998, 117) argues that "policy preferences [...] would normally be considered among the secondary aspects of a system, [but] they share the crucial characteristics of the policy core: they are broad in scope (affecting virtually all members of the subsystem), involve very salient beliefs, and have been the source of long-term conflict. Thus they could be added to the policy core." Hence, policy core policy preferences span both levels of beliefs, and it would be futile to focus on only one level. Due to this overlap and the importance of both levels for coalition formation, we chose to make no distinction between the two levels and code both together to define the discourse network. Approximately 50 policy solutions were identified in the first debate and 75 in the second, totaling 91.

A great majority of policy proposals (beliefs) found in the first debate were also observed in the second debate. The statements were manually coded in the software *Discourse Network Analyzer* (Leifeld 2024). For each statement, the organization, policy belief, and a binary agreement variable indicating support or opposition to the belief by the actor were recorded. This produced a comprehensive national-level media dataset that covered actors' self-reported beliefs during the two national debates.

3 | Methodology: Discourse Network Analysis and Advocacy Coalitions

To analyze how actors develop their beliefs over time in the three phases, we use the discourse network analysis method (DNA). DNA measures both cross-sectional and temporal interdependence between actors and their public statements (Leifeld 2017). The method not only measures which actors jointly agree or disagree with proposed policy solutions; it also traces the development of actors' relationships over time. For instance, it tracks changes in ties between actors as their beliefs about policy solutions evolve and as they begin to concur or differ with other proposed solutions in a debate. Interdependence between actors is gauged by either agreement or disagreement with a policy solution voiced during the debate.

In DNA, statements are the basic unit of analysis. Statements are public claims made during a policy debate. Each statement encompasses four variables: the *actor* who speaks; the *concept* that summarizes the policy belief the actor refers to; the actor's *agreement or disagreement* with the concept; and a timestamp (Leifeld 2017). Actors can be government entities, political parties, non-governmental organizations, or prominent individuals. Concepts are claims about preferred policy instruments, that is, beliefs about which solutions constitute useful policy solutions. DNA also contains the binary variable of agreement or disagreement to denote the sentiment regarding a proposed policy solution. Lastly, the timestamp variable logs the specific day of an actor's statement, facilitating the observation of evolving policy discourse over time (Leifeld and Haunss 2012; Leifeld 2017).

After coding the debate content using these variables in text documents, such as newspaper articles, the actors are re-interpreted as nodes in a network and connected through ties representing shared agreement or disagreement over concepts. Here, we use the "subtract" method, which subtracts any two actors' disagreements over concepts (the "conflict network") from the number of their agreements over concepts (the "congruence network"), and then removes any negative ties, which would indicate more disagreement than agreement between actors, and retains only the net agreement ties between actors (Leifeld 2017). Doing so generates positive values where there is more agreement than disagreement between actors. The tie weights are normalized using average activity normalization, which divides each value by the average number of concepts both incident actors refer to overall. This step ensures that highly active membership organizations do not appear as hubs and obfuscate the cluster structure of the network. Clusters in this network represent advocacy coalitions or their precursors, clusters of actors around shared solution concepts.

The Girvan–Newman edge betweenness community detection algorithm is used to find clusters (Girvan and Newman 2002). It offers several advantages: First, it is easy to understand as it repeatedly removes the most central edge and assesses which

resulting clusters form. Second, the method is readily implemented in the software visone, which we use to generate the network diagrams. Third, it generates a full hierarchy of nested clusters and allows us to see how sub-coalitions are related to parent coalitions, allowing us to examine the differentiation into multiple groups of solution-oriented or vested-interest actors at any point in time. In determining the final cluster structure, we considered cluster solutions at different levels of granularity and retained the structure that was most in line with supporting heatmaps and other exploratory evidence in the process of data analysis that together inductively generated a coherent theory. Solutions with less granularity exhibited too little cluster structure to make theoretical sense, and solutions with higher granularity displayed too many clusters to be interpretable theoretically. This process is in general keeping with exploratory multivariate data analysis (e.g., factor analysis, weighted network analysis), where the signal needs to be separated from the noise by setting thresholds, selecting the right number of factors, or similar. Comparability across time points was evaluated alongside the selection of the right granularity. Fourth, by repeatedly cutting the network into components, the method requires low connectivity between clusters, or coalitions, but not necessarily a strong internal cohesion of the identified clusters, which allows for the detection of internally somewhat ideologically heterogeneous coalitions as long as they are distinct from each other.

While the disadvantage of using DNA is that coordination and other material relations between actors cannot be measured, DNA's strength is that it provides a longitudinal view of the development of the subsystem that cannot be achieved using repeated surveys. Surveys and interviews would be less suitable for tracing longitudinal subsystem developments because repeated elite interviews are subject to panel attrition due to the burden on interviewees (Leeper 2019). Retrospective interviews, meanwhile, would suffer from recall bias, memory problems, and low accuracy (Coughlin 1990; Finney 1981; Geweke and Martin 2002; Janson 1990; Van Der Vaart et al. 1995).

4 | Inductive Theory Building: Three Stages of Nascent Subsystem Maturation

A subsystem is born when a new problem in need of policy solutions enters the political agenda. A political agenda can be imagined as a priority list of items or issues that receive political attention (Walgrave and Van Aelst 2016). Political actors who have an interest in addressing the problem through policy may be opposed by those who would like to keep the status quo or see the problem addressed in different ways.

Among those who display an interest in the problem, we posit that two types of actors can be analytically distinguished and that their distinction matters in the first two stages: *vested interests* and *solution-oriented actors*. Vested interests are those actors who have narrowly defined constituencies that do not span the general population. For example, a teacher's union represents only teachers and will consequently seek to adopt policies benefiting teachers, even if these policies do not have the best interests of pupils, the economy, or retailers at heart. An industry association representing the airline industry will seek protectionism of their particular industry and will prioritize such policies over policies protecting passengers, teachers, consumers, or other population segments. In contrast, solution-oriented actors represent a wider constituency spanning different parts of the population. For example, political parties, government agencies, and the civil service will try to adopt policies with a wider appeal to different segments of society, even in the case of niche parties and specialized agencies. Scientific bodies and the National Health Service will serve a dual role and represent their specific members (scientists, doctors, nurses) but also the general public as the addressees and principals of their work (i.e., society, patients) and can therefore be mainly classed as solution-oriented actors, not vested interests. The two categories display some overlap and can be thought of as opposite ends of a spectrum. The distinction is introduced here because the two extremes of this dimension can be expected to have different incentives to act. While vested interests will seek to create particularistic coalitions first and foremost and secede from larger actor coalitions in the advocacy coalitions they form, the remaining solution-oriented actors can be expected to form broad issue networks in searching for solutions that benefit large segments of society. We expect this to be the case across a range of nascent subsystems. For instance, when a new energy technology like fracking becomes available, a large part of actors will initiate a search for information and act as agents of the general public while a few vested interests will immediately seek to protect their narrowly defined constituency, such as local residents or specific energy industry branches that might be threatened by the new technology. Vested interest actors will advocate for a more specialized subset of policies immediately to protect their principals or constituency. In later stages, the different vested interests will split into separate sub-coalitions and then join forces with some of the solution-oriented actors once they have scrutinized the problem sufficiently to have formed core policy preferences as explained below.

The process from the emergence of the problem to the existence of stable advocacy coalitions can be analytically subdivided into three stages. While characterized by stochasticity, empirical research should be able to detect these phases in nascent subsystems if our observations extend to other cases, with the caveat that many problems may have existed for a long time and cannot be easily traced back to these initial stages. The three initial stages of policy subsystem maturation are summarized in Figure 1 and can be characterized as follows.

4.1 | The Problem Discovery Phase

As a new problem emerges, policy actors are pressured to find a solution. Because new problems often have little history of policy solutions or output (Sabatier and Jenkins-Smith 1993), actors are limited in applying similar solutions from previous policy processes. They need to discover new ways to deal with the problem.

Instead of making fully informed decisions, actors try to make sense of the situation caused by the possibly sudden emergence of a crisis (Cohen et al. 1972; Rubin and de Vries 2020). To find

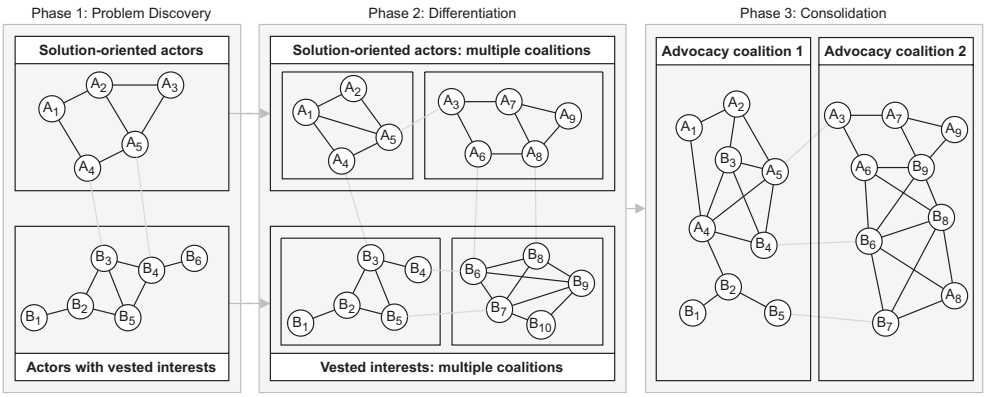

FIGURE 1 | Three stages of nascent policy subsystem. The ties between actors (nodes) represent belief agreement ties.

a solution, they engage in a policy debate where they share their ideas on how to solve the problem. A policy debate is a public space where the actors make public claims about their preferred solutions.

Expanding on the Multiple Streams Framework (Kingdon and Stano 1984), which emphasizes the importance of linking a specific problem with a viable solution during a critical policy window, participation in the policy debate is important because it offers an opportunity for actors to acquire public support, to change the way other actors perceive the new problem, and lastly, to ensure that their preferred solution becomes part of a parliamentary agenda where policy decisions are made (Leifeld 2017). When more actors participate in a debate, the debate becomes attractive to the media and the broader public, which elevates the discussion onto the collective political agenda (Sabatier and Weible 2007) and which in turn draws new actors into the debate. If a debated issue is placed highly on the political agenda of influential actors, such as government departments and epistemic communities, it is more likely that proposed solutions eventually turn into policy outcomes.

In the context of a newly emerging crisis, executive political bodies, such as government agencies and departments, play an important role in setting the political agenda as the public expects a reaction from the government (Boin et al. 2016). Meanwhile, epistemic communities, often led by scientists, narrow the discussion with the goal of reaching technical policy solutions (Dunlop and Radaelli 2013). The relationship between executive political bodies and epistemic communities is influenced by the level of available information. When more information is available, political actors can better calculate trade-offs, which can change the role of epistemic communities from educators to legitimizers of decisions. While political actors are strictly defined by their institutional roles, epistemic communities include a variety of expert actors, including governmental bodies, research institutes, and international organizations (Dunlop and Radaelli 2013). The scope of actors engaged in an epistemic community might expand when there is limited information about a new problem, requiring expertise from various scientific domains, and it might contract when more information becomes available. But participation in a policy debate may include actors other than political entities with an institutional mandate and actors based in epistemic communities. Non-governmental organizations, like workers' unions or business representatives, can also take an active role in influencing the debate, championing their economic, social, or political interests.

Actors who participate in the first stage of a policy debate can be partitioned into two broad groups: *solution-oriented actors* and *vested-interest actors*. The first group, comprising both governmental and non-governmental entities, includes public bodies, such as governmental agencies, universities, and hospitals, as well as private actors like charities, trusts, and other non-governmental organizations. This group aims to solve problems that threaten society, and its composition may depend on the nature of the problem.

For the solution-oriented actors, proposing solutions that align with public interests is part of their functional role, which mandates them to advocate for the interests of the wider public. This explains why they often have a central role in a policy debate, as they are expected to protect and promote public interests. The centrality of institutional actors in a policy debate is a result of their formal institutional role (Kammerer and Ingold 2021) and the public's expectation that governments are the primary responsible entities for addressing new problems (Boin et al. 2016). Non-governmental organizations, such as universities or charities, may participate in the debate when their expertise aligns with the promotion of public interests, creating a synergy with societal needs on the topic and forming the "nerves of government" in perceiving and solving crises (Deutsch 1963).

In nascent subsystems, a scarcity of reliable information combined with a high level of uncertainty hampers actors' capacity to fully comprehend the problem they confront. Consequently, they often tackle the issue based on overarching assumptions rooted in their fundamental values. Sabatier and Weible (2007, 194) describe these overarching assumptions as deep core beliefs. However, in the problem discovery phase, the uncertainty and scarcity of reliable information are so pronounced that actors cannot establish a clear correspondence between their deep-core beliefs and expressed preferences with regard to possible solutions to the problem yet. When a new, pressing crisis emerges, actors first and foremost collectively focus on discovering *any* new solutions. It is only later, in the second stage, that they filter these solutions through the lens of their deep core beliefs, once a sufficiently large set of candidate solutions has been produced in the debate. The urgency of finding suitable

candidate policies not only expands the list of potential solutions but can also mitigate deeply rooted ideological differences.

Despite the prevalence of uncertainty and low level of information, not all actors are unsure about how to approach a new problem; some can define their interests in advance. The second group, vested-interest actors, primarily aims to protect their specific, collective interests on behalf of a well-defined constituency. Even in the face of uncertainty and information gaps, they readily discern how new issues might affect their unique interests. Representatives from workers' unions, business chambers, particular industry sectors, and similar entities often populate this group of actors, driven by members who expect safeguarding of their collective stakes, such as protection from job loss, health hazards, financial losses, or other ills potentially caused by policy change in addressing the crisis. And while there may be times when these interests align with broader public concerns, their main priority remains the protection of their group's collective interests. Should a clash arise between public and collective interests, the latter take precedence.

The differential, yet both institutionally mandated, logics of the two groups of actors lead to a particular subsystem structure. The alignment of beliefs can be illustrated as an actor congruence network in which ties between actors represent mutual agreement on proposed policy solutions (Leifeld 2017). The majority of actors are loosely connected through shared discussion and support of any policy solutions that emerge during the initial stage of the debate. These solution-oriented actors support each newly discovered candidate solution initially and thereby show volatile but discernible overlap in their policy preferences. These actors form one large, central cluster in the discourse network underlying the subsystem that supports numerous general solutions representing public interests. The vested interests make up a second group in the periphery of the discourse network. They form their own cluster, potentially with smaller sub-clusters by industry or constituency, displaying general opposition to any interventions that could have negative consequences for their constituencies, uniting them in skepticism of regulation and in mutual support for specific solutions that safeguard their unique interests.

This alignment resembles the distinction between policy containers (those who want to preserve the policy status quo) and expanders (those who seek to change it) described by Tosun and Schaub (2017), Schaub and Metz (2020), Leifeld et al. (2022), and others. But it differs from this distinction because policy containers and expanders may both be found among either actor type, vested interests and solution-oriented actors. For example, in the COVID-19 case, it is conceivable that retail unions wish to protect retail employees with lockdowns (an expansion of policy) and that an airline industry association seeks to protect jobs by containing such policies, and yet both actors are in the group of vested interests. Both would be initially united in calling for alternative policies that protect both of their industries, such as social distancing (making them both policy containers initially) before adopting more specific stances related to their respective constituencies as they become available through discovery by the second stage, potentially making one of them an expander and the other one a container. Hence, the distinction between solution-oriented and vested-interest actors cuts across the distinction of expanders and containers and is sometimes, but not always, congruent with it.

A distinct spatial separation of the two groups in the network signifies the formation of the problem discovery phase. This phase is illustrated on the left in Figure 1.

4.2 | The Problem Discovery Phase: Empirical Evidence

Figure 2 shows the actor congruence network that is the result of analyzing actors' policy solution proposals during the first debate. To distinguish between different organizations in actors' networks for both periods, actors (nodes) were assigned to five groups (colors): (1) private sector actors (e. g., business organizations, financial institutions, business associations, etc.) are colored in green; (2) civil society organizations and institutions (e. g., charities, education unions, religious organizations) in magenta; (3) medical experts colored red; (4) governmental actors (ministries, governmental bodies, devolved governments, and other political actors, such as parties) in navy blue; (5) other organizations, such as foreign governments, in white color.

At the center of the network, we see the most prominent cluster (cluster 1), representing the solution-oriented group. Within this cluster are governmental actors like the Prime Minister and the Government, along with representatives of regional governments. It also includes health experts such as the Scientific Advisory Group for Emergencies (SAGE), World Health Organization (WHO), European Centre for Disease Prevention and Control (ECDC), and National Health Service (NHS). Universities and other governmental and non-governmental actors, such as the National Association of Schoolmasters Union of Women Teachers (NASUWT), Associations of School and College Leaders, and the Mayor of London, are also present in this cluster.

The predominant presence of governmental actors and health experts aligns with theoretical findings which suggest that governmental actors are expected to act in times of high uncertainty and lack of information. Furthermore, health experts and universities provide crucial information and guidelines when knowledge about the pandemic is limited.

The prevalence of top executive figures, alongside governmental and expert actors, can also be attributed to the mediagenic nature of these individuals. Since the coded statements were sourced from newspapers, the documented participation of specific actors in public discussions is significantly shaped by the editorial policies of these publications. During crises, journalists tend to seek insights or report remarks from individuals who are anticipated to make critical decisions or who possess the legal authority and credibility to act. While mediagenic actors introduce a level of bias in debate analysis, it is crucial to remember that media outlets are businesses that present news based on what the general public deems significantly important. In the context of the COVID-19 policy discussion, two crucial topics were London's transportation system and the feasibility of face-to-face classes, as both would impact a large population if public transport was reserved for emergencies or if schools shut down.

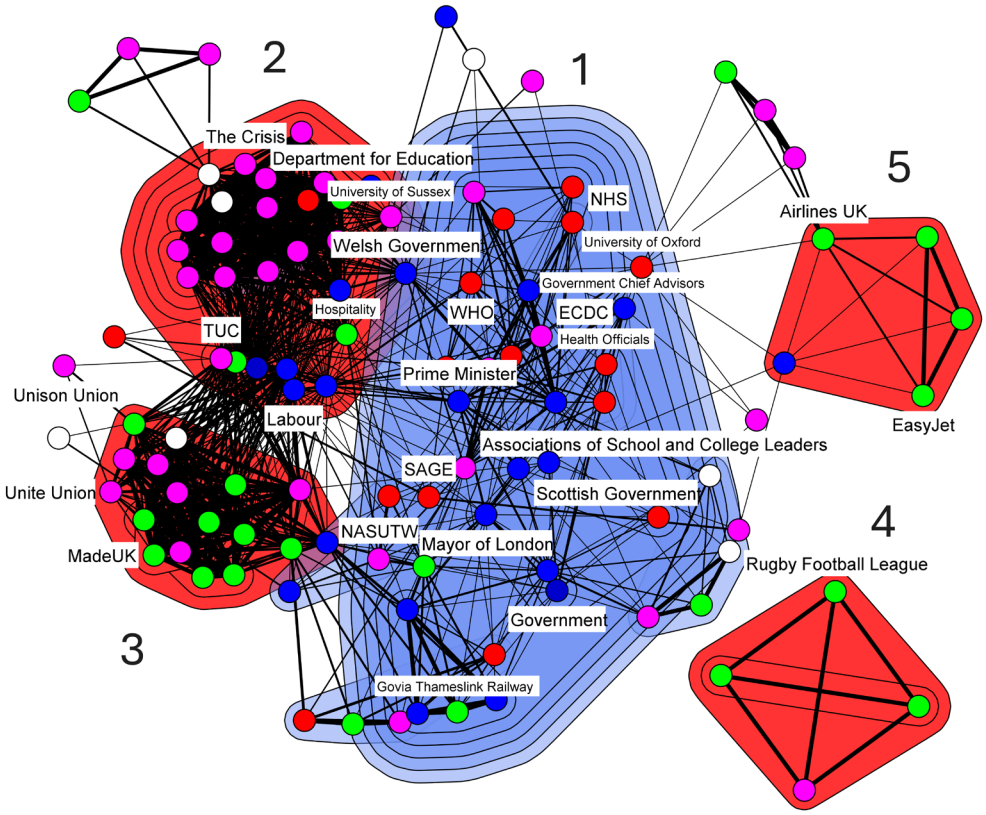

FIGURE 2 | Actor congruence network for the first period (March 9–22, 2020) with threshold $w < 0.111$. Solution-oriented clusters are painted in blue, vested-interest clusters in red. Minor adjustments have been made to the original layout prescribed by the graph drawing algorithm. These modifications were necessary to increase the readability and clarity of the labels in the figure.

The heightened public interest in these areas explains the involvement of educational union representatives like NASUWT and the Association for College Leaders, and the representative from London's local authority, the Mayor of London.

Several vested-interest clusters are found in the periphery of the network, most notably several overlapping clusters on the left in Figure 2. The upper part of this overlapping cluster structure is predominantly made up of charities (cluster 2). Organizations such as charities have a keen interest in safeguarding those most vulnerable to the effects of social distancing measures, like low-income workers at risk of redundancy if eateries shut down, the homeless, and other marginalized groups dependent on food banks. The bottom region is populated by business representatives and workers' unions, such as MakeUK and Unite Union (cluster 3). Unlike charities, their main emphasis is on advocating for financial support for businesses, which they believe is essential if closures are mandated by the measures.

In addition to these major overlapping clusters of vested interests advocating for broader financial protection for businesses and vulnerable individuals, there are smaller clusters on the network's periphery calling for specialized industry support (clusters 4 and 5). These peripheral clusters consist of representatives from the airline and entertainment industries, including Airlines UK, EasyJet (cluster 5), and the Rugby Football League (cluster 4). They stand apart from the other two clusters by not solely advocating for the protection of workers' rights and wages. Instead, they explicitly call for tailored support for their industry—financial aid for the airline and entertainment sectors and opposition to the closure of public events.

Other intermediate clusters situated between the five dominant clusters consist of actors with interests that align with both solution-oriented and vested interest clusters. For instance, political parties aim to represent the broader public interest while concurrently backing specific groups like unions in their efforts to urge the government for enhanced financial support. Prominent UK unions, including the Traders Union Congress (TUC) and Unison Union, advocate for both augmented financial aid for businesses and safeguarding low-wage workers, which also aligns with the positions of the Labour Party under their outgoing party leader Jeremy Corbyn. A range of actors around the Department for Education, situated in the periphery of the vested-interest cluster on the left, advocate for stricter measures and school closures to protect children and educators.

The structure we see in this early stage of the nascent subsystem is one where both government and non-governmental actors puzzle over how to prevent the gravest damage to society, while the periphery of the network is characterized by interest groups trying to protect industry and workers from the fallout of their proposed solutions.

We also analyzed qualitatively and using additional multivariate techniques (not included here) what solutions actors endorsed or rejected and how this led to the different clusters. The results support the cluster structure and the positions taken

by solution-oriented and vested-interest actors. In particular, solution-oriented actors including primary governmental actors such as the Prime Minister and health officials champion a range of solutions, from encouraging citizens to curtail travel to promoting stay-at-home directives, for example, "Non-essential travel should be avoided.", "People should stay home to help NHS". Occasional instances where disagreement with stricter measures appears in the cluster of solutions supported by the government can be attributed to the government's role as a representative of a heterogeneous public body, necessitating a balance between diverse, often contradictory interests, for example, "Public event should not be suspended" or disagreement with closure of schools. Additionally, the swift rise in infection rates over a brief period forced the government to markedly shift its rhetoric, transitioning the discourse from a relaxed approach to the pandemic to the adoption of more stringent measures as the date of the first national lockdown neared. Vested-interest actors like the TUC union, Labour Party, and the hospitality sector (lower part of cluster 2) predominantly endorse solutions to shield their members who are impacted by the economic fallout of the COVID-19 pandemic (aligning with "The government should protect those affected by the measures." and "The government should increase financial support for those affected by the pandemic."). In the upper part of cluster 2, we find the education sector represented, with many actors advocating for school closures and stricter measures in order to protect children and educators. Their beliefs include "Schools should be closed." and "Current measures are not enough.". This group will become more present during the second phase. In line with this group trying to protect the education sector, there exists a group of solution-oriented actor (like the NHS, University of Oxford, regional governments in the upper part of cluster 1) that aligns with these beliefs and opposes the discourse and solutions proposed by the primary governmental actors.

4.3 | The Differentiation Phase

As the debate progresses, an increasing number of actors contribute to public discussion, introducing diverse strategies to tackle the issue effectively. The influx of proposed solutions allows actors to reflect not only on their own ideas but also on those of others, considering the best approach to address the issue. With more information available, actors are capable of understanding the pros and cons of each proposition better. Certain solutions begin to stand out as either overly broad or not fitting the criteria of some participants.

When the set of suggested solutions reaches its saturation point and fewer new candidate policies are added, actors reflect more on the different alternatives and begin prioritizing some solutions over others. Some solutions may appear too simplistic or unsuitable. For example, actors who were previously interested in protecting people from the impacts of an economic crisis by any available policy means may now advocate for specific solutions, such as proposing subsidies or lower taxation, as they find general calls for economic help inadequate.

As general solutions prove inadequate to address the specific ramifications of a policy problem, actors begin to propose particular policy solutions Sabatier and Weible (2007) describe as policy core beliefs. Policy core beliefs operationalize deep core beliefs, allowing actors to prioritize among various policy-related values (Sabatier and Weible 2007, 195). The efficacy of a proposed solution and its beneficiaries may become more significant than the solution's mere potential benefits. In doing so, actors still seek solutions, but they begin aligning the solutions they support with their more general belief anchors now that a sufficiently large menu of solutions to choose from has become available. The evolution and growth of the debate enable actors to make better judgments about which solutions align more closely with their deep and policy core beliefs. Consequently, the range of acceptable solutions narrows, and actors begin to concentrate on a limited set of policy alternatives.

The transition to policy core beliefs based on actors' capability to evaluate the efficacy of a proposed solution requires that actors have become well-informed and knowledgeable about the policy problem. This change occurs through a process of policy learning in which actors draw lessons on the viability of a policy, social construction of the problem, and political feasibility of a proposed solution (Dunlop and Radaelli 2013, 600).

As the debate unfolds, even though the exact process of information acquisition is not directly visible, it is likely that actors are exposed to new insights. The new insights can originate from external changes and developments related to the debated issue (see also Bandelow and Kundolf 2011) or, internally, from their political opponents who may introduce more innovative and effective solutions to address the issue at hand. If the time horizon of the crisis permits, first experiments with solutions, perhaps of a localized nature, may have been implemented and provided initial insights into their feasibility and efficacy.

As actors focus on proposing solutions from the menu of policy alternatives, divisions emerge within previously homogeneous groups that supported a range of seemingly similar solutions. Actors begin to differentiate based on the specific solutions they advocate for, leading to the formation of subgroups that align with similar policy core beliefs.

The emergence of new divisions can be observed in both the solution-oriented and vested-interest groups. While their proposals remain closely tied to public interests, actors in the solution-oriented group now have differing views on how to achieve those interests. For instance, one government department might argue that the repercussions of an economic crisis can be mitigated by introducing new taxes, while another department may advocate for direct financial aid for those affected. Yet another solution-oriented actor, perhaps a research institute, may propose labor market measures to address the crisis. Each of the entities in this example proposes solutions aligning with their aim of alleviating the consequences of the economic crisis, but they differ significantly in their policy core beliefs and regarding which specific approach aligns more closely with their policy values and, ultimately, deep core beliefs. Different deep core beliefs therefore introduce divisions between actors of the same type who were previously aligned in their quest to solve a shared problem.

The same process is evident in the vested-interest group of actors. For example, general demands by workers' unions for

financial support, articulated early in the debate, have since evolved to more detailed requests, suggesting that financial aid should align with the unique needs of their sector. The hospitality sector might advocate for wage subsidies, as lower-income workers could be more adversely affected by an economic downturn, whereas airline industries might seek government subsidies for passenger fees to boost ticket sales. In both scenarios, the actors aim to safeguard their specific interests by proposing precise solutions that more effectively serve those interests. While the dynamics of this differentiation might fluctuate based on the particular policy issue being discussed, the overarching process delineated in the stage model should be broadly relevant. For instance, debates surrounding climate change might span a more extended period and encompass a varied range of participants, but the fundamental progression from proposing general to specific solutions rooted in policy core beliefs persists. Therefore, our three-stage model provides a framework for understanding the evolution of policy debates and policy subsystems in their early stages.

The manner in which actors interpret a problem is also reflected in the configuration of the actor congruence network during the differentiation phase. The large cluster of solution-oriented actors, who once backed a single or a handful of shared solutions, now becomes fragmented into multiple smaller clusters. Each of these clusters now advocates for specific solutions, which they find more representative of public interests and in line with their general beliefs. Depending on the institutional setup, even within government, different departments or agencies may no longer unanimously support the same solutions and may stop acting as one united entity. Instead, they gravitate toward distinct clusters that align with the specific policy interests of their respective departments, such as finance, labor and economy, environment, health, etc. or their underlying deep-core beliefs, such as market-based solutions or promoting equality and fairness.

Clusters populated by vested-interest actors in the periphery of the network are increasingly further divided into smaller clusters due to the further diversification of their specific interests. Following the rationale that each industry might advocate for a particular solution tailored to its needs, it seems that the differentiation phase could lead to a continuous proliferation of increasingly specific solutions, which might exacerbate internal and external divisions among groups of actors.

However, the endless expansion of new solutions is limited by resources, such as time and money, that actors have at their disposal to advocate for their specific solutions. To optimize the use of limited resources and increase the likelihood of success, in the next phase of the debate, actors begin to consolidate their policy core beliefs by aligning them with other compatible policy solutions.

Actors' alignment of ambiguous initial information with their remaining belief system is an instance of policy learning. While this article is not trying to provide a general theory of policy learning, it contributes to our understanding of the motivation for policy learning when the informational landscape changes in nascent subsystems. Actors need to gain knowledge to modify their behavior, requiring an update in their beliefs before teaming up with other actors in the third stage described below. This belief updating due to information saturation can be described as policy learning. It also illustrates how policy learning can produce structural change in a policy subsystem through differentiation.

4.4 | The Differentiation Phase: Empirical Evidence

As depicted in Figure 3, the saturation of the set of proposed solutions led to increased divisions among actors concerning which of the solutions were deemed appropriate. The increased polarization between actors also reflected in the Girvan-Newman modularity score, which has increased in the second period. The previously unified, large cluster of solution-oriented actors has now split into several distinct clusters and led to a fragmented subsystem.

In the large blue cluster at the top of the network (cluster 1), we see government actors advocating for the continuation of a limited approach to implementing restrictive social distancing measures after their relaxation following the first lockdown. Within this cluster, there are also some scientific actors, such as the WHO and the University of Exeter, who support the policy solutions proposed by the government and legitimize their decisions.

Now, a distinct cluster of health experts is evident (cluster 2). This cluster represents a group of various health entities who believe the government has adopted a "too liberal" approach to measure implementation, overlooking scientific findings. This group encompasses diverse health participants, including SAGE, Independent SAGE, and political entities (opposition parties like Labour and regional governments).

The charity cluster from the first phase (city councils and charity actors concerned about the well-being of vulnerable groups) and the workers' cluster (comprised of workers and business representatives demanding increased financial support) were previously in an overlapping cluster and are now dispersed among several clusters (cluster 3 and cluster 4). Many of them are split between a group of actors advocating a continuation of the financial support from the first lockdown (cluster 3) and those apprehensive about the impact of further increases on public finances (cluster 4).

Finally, there are two new clusters representing actors rallying around the recently emphasized need to justify policing and coercive measures. The cluster on the left primarily involves police organizations and advocates for coercive measures (cluster 5). Conversely, the cluster on the right displays strong advocacy from religious organizations and sections of the Conservative Party, such as the Tory 1922 Committee, highlighting concerns for civil liberties and the risks coercive measures pose to them (cluster 6).

Qualitative and additional multivariate analyses (not displayed here) show not only a pronounced differentiation in the supported solutions, but also polarization patterns centered on two main issues: whether the government should provide additional

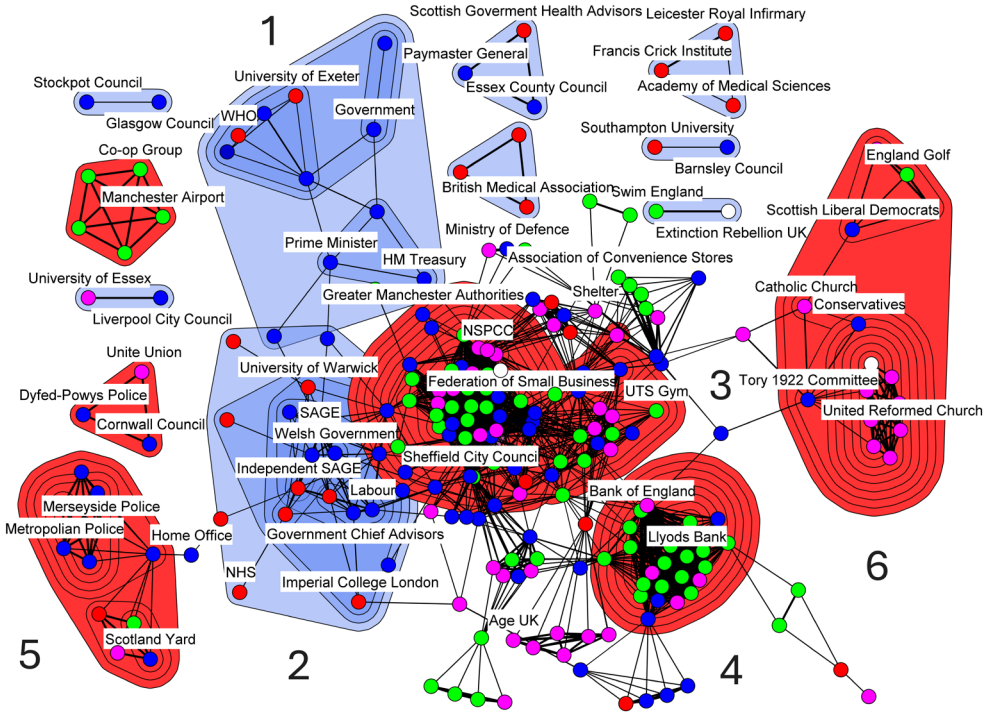

FIGURE 3 | Actor congruence network for the second period (October 14 to November 5, 2020) with threshold $w < 0.4$. Solution-oriented clusters are painted in blue and vested-interest clusters in red. Minor adjustments have been made to the original layout prescribed by the graph drawing algorithm. These modifications were necessary to increase the readability and clarity of the labels in the figure.

financial support and if stricter measures should be implemented, given the outcomes of the first period's lockdown.

Overall, in this differentiation phase, we see a stronger fragmentation of the subsystem with many distinct underlying beliefs. They are beginning to form political fault lines that will later lead to polarized belief systems after aggregation into larger coalitions.

4.5 | The Consolidation Phase

The differentiation into smaller clusters within the solution-oriented group of actors and within the vested-interest group of actors, respectively, has led to a fragmentation of the political landscape. Actors recognize, however, that they need to team up with other, ideologically compatible actors to achieve policy goals. They have an incentive to align their narrow, preferred policy mix with compatible other policies to form a complete belief system. They also anticipate that other actors in opposing camps may do the same. This ultimately results in an "arms race" during which multiple small clusters align their interests around shared median deep core beliefs until two stable coalitions have been formed in opposition to each other. These new advocacy coalitions now comprise both solution-oriented and vested-interest actors whose interests naturally align around shared belief systems. This is the beginning of a mature subsystem with entrenched advocacy coalitions that may remain stable for years unless the crisis is completely resolved and never reappears.

For example, while tax breaks for major companies, perhaps advocated by a large industry association, and tax breaks for small enterprises, perhaps advocated by the government department for business and trade, might differ in specifics, they share a common aim—shielding businesses from economic downturns—and an underlying deep core belief—the efficacy of trickle-down economics. Rather than pushing for distinct tax alterations, the two actors might get behind shared policy proposals, anticipating the ripple effects of such tax reforms would favor both kinds of companies. By aligning beliefs with compatible other beliefs, actors can more effectively pursue their objectives. Through this alignment and consolidation into broader, coherent belief systems and, effectively, advocacy coalitions, actors can assert their policy beliefs more effectively vis-à-vis other coalitions that have been consolidating at the same time in a similar way.

Because participation in a policy debate requires resources such as time or money, actors realize that it is more efficient to advocate for similar solutions instead of introducing new ones. Aligning with compatible beliefs enables participants to achieve their objectives more efficiently. By forming broader coalitions and synchronizing their policy stances with those they align closely with, they can amplify their collective voices more effectively. This iterative process of gravitating toward the most beneficial solution, fueled by concerns about rivals consolidating faster, culminates in two or possibly more advocacy coalitions that have been described as characteristic of a mature policy subsystem (Sabatier and Weible 2007).

Docking policy and deep core beliefs onto other compatible solutions is important for establishing future collaborations between actors, as building contacts with other actors is a costly investment in terms of both time and money (Ingold 2011). The literature has described coordination as

a precursor for developing shared beliefs and forming coalitions in nascent subsystems (Ingold et al. 2017; Wiedemann and Ingold 2024), but the reverse pathway is also theoretically plausible and should be investigated in future research. Since the resources spent on contact-making cannot be utilized for other activities, actors might assess the compatibility of their beliefs with those of potential allies before establishing any collaborations.

The consolidation phase of a nascent policy subsystem provides observable cues that indicate the transition from a nascent to a mature policy subsystem. The duration of this phase can vary depending on factors specific to each policy debate.

4.6 | The Consolidation Phase in the UK's COVID-19 Case

Toward the end of the second time point in our empirical analysis, we observed polarization patterns among the differentiated clusters. The empirical analysis does not cover more recent time points, but the consolidation into aggregate coalitions along the political fault lines of personal liberty versus protection from harm through coercive measures and financial subsidies for affected individuals and industries versus financial consolidation might have led to an aggregation of the smaller clusters into larger coalitions. These same conflict lines were later visible during debates around mass vaccinations and bailouts for firms affected by economic turmoil caused by the pandemic.

This aggregation into stable advocacy coalitions around these recurring conflict lines can be connected to mechanisms in the advocacy coalition framework. The progression from a differentiated, fragmented subsystem to stable advocacy coalitions with consistent belief systems can be attributed to the inherent policy trade-offs of lockdown. The "winners" and "losers" from these trade-offs (Cairney 2021) would form two distinct groups: the winners championing the continuation of the current policy solutions and the losers pushing for their cessation. Precursors of this trajectory are evident in our analysis. The discourse during the second lockdown gravitated toward the financial feasibility of government measures to assist individuals and businesses (debating more versus less public expenditure) and deliberations over the necessity of another lockdown (weighing the need for a national lockdown due to rising infection rates against the dire repercussions of lockdown on the economy and individual well-being). This underlying conflict dimension has also been observed in other countries. For instance, a study on the stringency of policy measures in five African countries was titled "We would rather die from COVID-19 than from hunger" (Birner et al. 2021), alluding to the value conflict around personal liberties and economic wellbeing.

The introduction of social distancing measures might also give way to divisive debates on whether COVID-19 vaccinations should be mandatory. These discussions draw in diverse actors with varying perspectives on the repercussions of mandatory vaccinations, as observed in the period following the vaccine rollout (Bardosh et al. 2022; Cheng 2022; Loomba et al. 2021).

To summarize, as the policy system matures, beliefs and preferences may change, be updated, or become irrelevant due to the availability of more information, shifts in the motivation of actors ("winners" and "losers"), or changes in the dominant narrative of the debate (e. g., the introduction of vaccines). Due to the evolutionary nature of the maturation process, it is challenging to conclude that the network structure of the COVID-19 debate would remain unchanged after the introduction of mandated vaccines in the policy debate. However, comparing our case to the trends observed in similar research on nascent policy subsystems (Fidelman et al. 2014), the observed increased polarization between the advocacy coalitions suggests that the nascent policy subsystem will transform into an adversarial policy subsystem. The discussion about mandatory vaccination may deepen the conflict and collapse the network into two opposing coalitions: those in favor of and those against mandatory vaccination.

The increased polarization and the rising number of involved actors and concepts resemble patterns observed in a mature policy subsystem. However, the lifespan of the analyzed nascent policy subsystem may be affected by future external events. Even though the COVID-19 policy debate has ceased as the virus has been brought under control with the help of vaccines, the subsystem may be revived and adapt to new issues, such as the emergence of a similar pandemic. Given the observed impact of COVID-19 on the formation of advocacy coalitions and the content of the policy debate, it is likely that, even if the issue itself ceases to exist, it will continue to influence future policy debates on similar topics, as seen in other cases (Dean 2022).

5 | Conclusion

We analyzed the trajectory of the belief systems and coalition structure in a nascent policy subsystem, the policy response to COVID-19 in the UK, and abstracted from the case by developing a theoretical model on subsystem maturation. The three-stage model distinguishes between problem discovery, differentiation, and consolidation as distinct processes that follow in a temporal order and predate the phases of long stability described in the advocacy coalition framework.

The case studied here is a clear instance of a nascent subsystem because nobody knew how to deal with the COVID-19 pandemic when it first emerged. However, this crisis also affected all parts of society and required fast solutions, which is not typical of nascent subsystems (e.g., Beverwijk et al. 2008). It is unclear how it generalizes to more narrowly confined subsystems in societal niches or subsystems with a longer time available for maturation. While the pandemic was a societal threat, nascent subsystems may also form around policy problems without a significant threat, such as distributive rather than regulative policy issues. More work is needed to understand if distributive policy subsystems mature in similar ways. Future research should theorize about what the possible distribution of nascent subsystems looks like and how nascent subsystems can differ in their structure and mechanisms.

While it is likely that all nascent policy subsystems share structural properties that allow their development to be observed through our model, future research will need to develop a

typology of nascent policy subsystems. This should particularly consider their duration and distinguish between those that emerged from existing policy subsystems and those that are entirely novel.

In some cases, such as COVID-19, we observed rapid development of the debate and transition between stages, which is not necessarily true for issues such as fracking (Ingold et al. 2017). This implies the need for investigating the role of time, as it can influence stage development and also raises questions about the model's applicability if the debate on a specific policy ceases to exist.

The appearance and co-existence of policy core beliefs and secondary aspects recorded in the data and described stages reflect the differences in functional roles between solution-oriented actors and vested interest actors, as described in the theory section. We do not exclude the possibility that in some cases, actors could immediately fall into coalitions as they already sort into them based on their pre-existing deep core beliefs. However, this is unlikely in cases that are entirely new and pose a grave situation, like the case analyzed in this paper and presumably a range of other nascent subsystems, as argued in the case selection section.

Our analysis did not distinguish between policy core beliefs and secondary aspects in forming discourse networks. Especially where there is a notable delay between the appearance of policy core beliefs and secondary aspects, perhaps in less fast-paced nascent subsystems, future research should explore the possibility of aggregating these two belief categories in a different way.

The three-stage model was developed by examining a single case. This adds some face validity to the model and is likely more useful than a model developed without empirical underpinnings. However, future research needs to apply this model to other cases and evaluate if it fits these other cases as well. The inductive theory development logic applied here in this research means that overfitting the theory to the data could be a possible concern. Therefore, comparative research needs to establish more clearly if and how the present case stands out and whether the three-stage process is observable in the average nascent subsystem.

In building the model, we emphasized that there is a strong relationship between actors' interests and beliefs. As this research focuses on how that relationship shapes the development of nascent policy subsystems, further research will need to explore other factors influencing beliefs, as not every belief is based exclusively on actors' interests.

It may need to be updated by considering complementary empirical cases and data. The model was developed inductively from the data and has not been independently tested because "hypotheses that are generated inductively from one data set can only be tested with a different data set" (Gould 2010; Ross 2003). Future research needs to test and refine the mechanisms we theorized about. The model represents our most likely interpretation of the data. The quantitative analogue of such reasoning would be the development of a statistical model by choosing variables that fit the initial sample well. There is no guarantee that the model will fit future samples well, and there may be regression to the mean in terms of model fit. Moreover, while this model constitutes, in our view, the most likely and sensible interpretation of the data, the fit of the model is not perfect. In particular, while there is a differentiation from the first to the second phase, it seems to be less pronounced in the group of vested interests because they are already somewhat fragmented during the first phase. Due to constraints in the data collection, we were also unable to observe at a higher granularity how exactly the differentiated clusters from the second stage aggregate into stable coalitions, even though there is growing evidence elsewhere that stable advocacy coalitions indeed resulted from this rewiring process (Perez 2021; Tang et al. 2023).

The theoretical components we described all mirror belief updating due to new information and competitive group pressures, that is, policy learning and collective action. Complementary research has looked into the ways coalitions are structured by more manifest relationships between organizations, such as coordination and collaborative ties and shared policy forum memberships as venues for information exchange (Ingold et al. 2017; Wiedemann and Ingold 2024).

While our theory can work without such theoretical underpinnings and fully in the spirit of the original formulation of the advocacy coalition framework along the lines of policy beliefs (Sabatier and Jenkins-Smith 1993, 1999; Sabatier and Weible 2007), future research should consider the potentially multi-directional, co-evolutionary flows of causality between coordination, shared policy forums, and the development of belief systems over time. This will be a challenging task because, on the one hand, survey research applied to coordination and policy forums does not permit a high temporal resolution of measurement like news media sources do, while on the other hand, news media sources do not contain any information on coordination and policy forums. The solution might lie in participatory action research or other ethnographic methods involving participant observation for data collection coupled with causal inference methods. On a theoretical level, one could try to incorporate both in formal models, such as agent-based models of nascent subsystems and advocacy coalitions. In our view, a formalization of the ACF, including nascent subsystems and especially mechanisms of policy learning (Dunlop and Radaelli 2013), are long overdue if significant progress is to be made in understanding how the different hypothesized mechanisms in and between advocacy coalitions structure subsystem development and decision making.

Despite potential challenges in applying the three-stage model to other cases of nascent policy subsystems, we are confident that this paper and the presented model will open new research avenues, enhancing the understanding of how nascent policy subsystems mature. Useful applications of DNA to nascent subsystems already exist (Lemke et al. 2023). They could be enhanced in future research by combining DNA with related methods such as the Advocacy Coalition Index (Satoh et al. 2023). In conclusion, this research establishes a theoretical foundation to explain the maturation process in a nascent policy subsystem, which we hope will be expanded, applied, and refined beyond the COVID-19 case.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data used in this article are available from the first author upon request.

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Appendix A

List of Coded Concepts

All non-essential contacts should be avoided.

Another national lockdown would be devastating.

Ban of mass gathering will lower the pressure on the emergency services.

Breach of civil liberties is justified with COVID-19.

Closure of public events is not supported by scientific evidence.

Closure of public gatherings is a blow to the industry.

Closure of schools is not justified by science.

Coercion to control adherence to the measures is allowed.

Current financial measures are not enough.

Current financial measures are not sustainable in the long run.

Current measures are not enough.

Current measures are supported by science.

Fall of R is not the result of stricter measures.

Financial help came too late.

Fines for breaching the isolation are counterproductive.

Herd immunity is not part of the government strategy.

If people continue to ignore current measures, stricter ones will be enforced.

If the situation gets worse, a lockdown is a viable option.

If there is no agreement with local governments, stricter measures could be imposed involuntarily.

It is important not to enact strong measures too early.

It is important that measures are supported by wider society.

It is important to continue with mass testing.

It is important to deploy stricter measures.

It is important to ensure the stability of the economy.

It is important to offer help for well-being.

It is necessary to implement a short-term lockdown.

Local approach for measures is better than the national one.

Local government is unaware of the severity of the situation.

Local measures are necessary to avoid a national lockdown.

Lockdown can succeed only if people voluntarily abide by it.

Lockdown will not happen.

Measures are implemented according to the situation.

Measures are imposed to save lives and protect the most vulnerable.

Measures should be applied fairly.

More power should be given to local authorities.

National lockdown is the last resort.

National lockdown is the only thing certain to work.

National lockdown should be implemented to relieve pressure off theNHS.

National lockdown should be implemented.

Non-essential travel should be avoided.

Parliament should debate the restrictions.

Partisanship should be left aside.

People over 70 should stay at home.

People should stay at home.

People should stay home to help NHS.

People should work from home.

Public events should not be suspended.

Public exams should be canceled.

Regional lockdown would not be effective.

Regional measures are not a result of consent but imposition.

Schools should be closed.

Short-term lockdown is a better alternative for decreasing economic costs of measures.

Short-term lockdown is supported by science.

Short-term lockdown needs to be used to develop long-term strategies.

Short-term lockdown would help business to have a profitable Christmas period.

Short-term lockdown would help slow down the infections.

Short-term lockdown would save lives.

Stricter measures are ineffective.

Stricter measures are not necessary yet.

Stricter measures could be counterproductive.

Stricter measures would hurt the economy.

Students should not go home for Christmas.

The NHS Track and Trace has failed.

The NHS Track and Trace needs to be improved.

The UK is a step behind in imposing measures compared to the other European countries.

The classes should be moved from face-to-face to online.

The government enacted measures on faulty scientific projections.

The government failed to properly communicate the measures.

The government is complacent to act on pandemic.

The government is not doing enough to protect the medical staff.

The government needs to communicate the measures better.

The government needs to scientifically explain the measures.

The government should apply a local approach for imposing measures.

The government should assess the economic impact of the lockdown.

The government should be sensible in imposing measures to the travel sector.

The government should clearly explain the pandemic situation.

The government should explain the different approach in comparison to other countries.

The government should help the airline industry.

The government should increase financial support for those affected by the pandemic.

The government should order pubs to close.

The government should protect those affected by the measures.

The government, not scientists, must take the decisions.

The politicization of measures is damaging public health.

The public cannot be trusted with adherence to the measures.

Those people who do not abide by the rules should be punished.

Travels from COVID hotspots should be banned.

Weaker measures are helping to develop herd immunity.

Weaker measures create a false sense of security.

Without stricter measures, the NHS will be overwhelmed.