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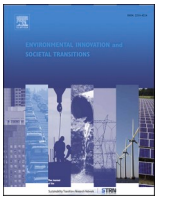

Research article

# Varieties of disagreement in transformative policy missions: A Q study on the decarbonization of Swedish industry

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ABSTRACT

Governments increasingly launch transformative policy missions to address complex societal challenges such as climate change. While the literature on mission-oriented innovation policy highlights the role of stakeholder contestation and emphasizes the need to promote alignment, it often overlooks the nature of underlying disagreements. This paper distinguishes between factual and normative disagreement across problems, solutions, and interventions, and applies Q methodology to identify and analyze four distinct stakeholder narratives in the mission to decarbonize Swedish industry. The narratives reveal different varieties of disagreement, ranging from factual concerns about technological feasibility and policy effectiveness to normative critiques of directionality and legitimacy. Our findings demonstrate that missions involve not only alignment, but also *disjointment* – persistent divergences of opinion rooted in fundamentally conflicting values and beliefs. Recognizing disjointment underscores the need for mission-oriented policymaking to balance efforts to foster alignment with strategies that address enduring conflict through mediation, recognition, redistribution, and compensation.

## 1. Introduction

A growing literature on transformative innovation policy (Haddad et al., 2022) views innovation as a means for tackling social and environmental challenges, rather than (merely) enhancing national competitiveness and economic growth (Weber and Rohracher, 2012; Diercks et al., 2018; Kuhlmann and Rip, 2018; Schot and Steinmueller, 2018). A central feature of this scholarship is the acknowledgment of normative directionality – the idea that a desirable direction of change should guide policymaking (Schlaile et al., 2017; Andersson et al., 2021). The goals defining this direction may emerge through bottom-up participatory processes involving a wide range of stakeholders but are also, to varying degrees, shaped top-down by governments and other influential actors (Parks, 2022). The latter perspective is associated with the seminal work of Mariana Mazzucato (2015a, 2015b, 2016, 2018a), which has made "missions" a common framing of transformative innovation policy among both researchers and policymakers (European Commission, 2018; Larrue, 2021; Mazzucato, 2018b, 2019).

In contrast to the scientific and technological missions of the twentieth century, today's *transformative policy missions* address

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complex societal challenges such as climate change and inequality (Janssen et al., 2021; Wittmann et al., 2021). They take the form of government initiatives promoting far-reaching change in socio-technical systems, employing a broad portfolio of interlinked policies and projects to reach well-defined goals in relation to a specific focal challenge (Mazzucato, 2018a, 2016; Larrue, 2021; Wittmann et al., 2021). Salient examples include recent government efforts to address climate change, where more than 100 countries have committed to achieving net zero emissions by mid-century (ECIU, 2025), with many also directing research and innovation towards decarbonization through comprehensive policy packages such as the EU's Fit for 55 framework (European Council, 2022).[1]

The literature on transformative policy missions has been criticized for treating complex societal challenges as manageable problems with clear solutions, while downplaying multiple interlinked goals, diverse potential solutions, and conflicting stakeholder interests (Brown, 2021; Kirchherr et al., 2023). In much of the literature, the formulation and interpretation of missions are taken for granted as they are "handed down" by policymakers (Kattel and Mazzucato, 2018; Mazzucato, 2016, 2018a). More recent conceptual work adopts a bottom-up perspective, highlighting that stakeholders are likely to hold divergent views on problems and solutions depending on their perspectives, incentives, available resources, vested interests, values, and beliefs (Wanzenböck et al., 2020). Such divergence may result in contestation between actors positioned in different socio-technical configurations who seek to reshape institutions in line with their preferences (Lowes et al., 2020; Holmgren et al., 2022; Madsen et al., 2022) and may hinder the mobilization of stakeholders to the collaborative efforts required to transform established socio-technical systems (Klerx et al., 2025). Consequently, it has been argued that policymakers should promote alignment processes leading to a shared understanding of problems and solutions (Elzinga et al., 2023; Janssen et al., 2023). These processes involve the convergence of problem framings and solution preferences, often driven by state-led initiatives providing guidance, legitimacy, and arenas for reflexive learning and negotiation (Wanzenböck et al., 2020; Janssen et al., 2023). However, with a few exceptions (e.g., Wiarda et al., 2023), the literature has paid less attention to explaining the nature of underlying differences in opinions, values, and beliefs. Without a conceptual and empirical understanding of the dimensions in which such disagreement manifests, policy efforts to promote alignment rest on weak foundations (Wiarda et al., 2024).

The purpose of this paper is therefore to conceptualize, identify, and analyze varieties of stakeholder disagreement in transformative policy missions. We thus step away from the notion of contestation – a broad and often vaguely defined term encompassing resistance, critique, and conflict over the institutional landscape (e.g., Wanzenböck et al., 2020; Madsen et al., 2022; Janssen et al., 2023; Wiarda et al., 2023) – and focus instead on underlying differences in opinions, values and beliefs. To move toward greater conceptual clarity, we separate different *types* of disagreement, distinguishing between factual and normative dimensions (Hume, 1739; Weber, 1949; Jasanoff, 2004; Putnam, 2004). We also extend the problem–solution space associated with missions (Wanzenböck et al., 2020; Wiarda et al., 2023) by adding policy interventions as a third *topic* of disagreement (Bergek et al., 2023). These additions to existing theory are integrated in an analytical framework that helps identify how opinions differ between stakeholders – a crucial step in the design and implementation of mission-oriented policymaking.

Our empirical research examines the decarbonization of Swedish industry. Since 2016, Sweden has a climate policy framework stipulating by law that domestic net emissions shall be zero by 2045 and that negative emissions shall be realized thereafter (Swedish Government, 2016). This goal is particularly challenging for the industry sector, where emissions are concentrated among a few firms and production plants supplying basic materials (e.g., steel and cement) and refining imported fossil fuels (Energy Transitions Commission, 2018; Swedish Environmental Protection Agency, 2025). At the same time, however, the combustion of forest residues in Swedish industries offers opportunities from a decarbonization perspective. Firms producing pulp and paper emit large amounts of biogenic carbon (Andersson and Hellsmark, 2024), which can be captured and stored (i.e., bio-CCS) to remove carbon from the atmosphere.[2] According to the Swedish climate policy framework, this measure can account for up to 15% of the required emissions reductions until 2045 (Swedish Government, 2016).

The Swedish climate goals are supported through various national policy instruments (Swedish Climate Policy Council, 2023). Following the introduction of the climate policy framework, the longstanding carbon tax, first implemented in the 1990's, has been complemented with a major public funding program to support research, development and demonstration (Swedish Government, 2017), credit guarantees to investments in low-carbon technology (Swedish Environmental Protection Agency, 2022), as well as a funding mechanism for bio-CCS based on reverse auctions and various measures to facilitate carbon transport and storage (Swedish Energy Agency, 2021). The government has also initiated dialogue among firms and other actors through the collaborative platform Fossil Free Sweden, which has published several interrelated roadmaps towards industrial decarbonization (Fossil Free Sweden, 2021). These policy interventions complement the growing decarbonization pressure from European climate policy (e.g., the EU ETS, Fit for 55, CBAM, Innovation Fund) (Cornago, 2022), resulting in extensive low-carbon innovation activities (Andersson and Hellsmark, 2024).

The decarbonization of Swedish industry thus exemplifies a transformative policy mission; it is a government initiative addressing an urgent societal problem, anchored in a concrete and time-bound goal, supported by a range of policy instruments, and characterized by extensive innovation activities aligned with the overarching mission. Our analysis of stakeholder disagreement within this mission applied Q methodology – an established approach for studying human subjectivity (Brown, 1980; Watts and Stenner, 2012). Drawing on 25 interviews in which participants sorted statements according to a systematic procedure, we combined quantitative and qualitative analysis to identify and articulate four distinct stakeholder narratives reflecting different views on challenges associated with the

[1] See OECD (2022) for more examples.

[2] The potential contribution of biogenic emissions to climate change is accounted for within the land-use sector (LULUCF). Note also that the combustion of forest residues is widespread in the production of heat and power in the energy sector.

mission. Comparing and analyzing the narratives abductively (Dubois and Gadde, 2002) then enabled us to derive theoretical insights and reveal varieties of disagreement in relation to our analytical framework.

Our findings challenge the focus on alignment in the literature on transformative policy missions by demonstrating the prevalence of normative disagreement, which is unlikely to be resolved by initiatives that promote reflexive learning, dialogue and coordination. In the discussion, we introduce the concept of *disjointment* to describe a persistent divergence of opinion rooted in fundamentally conflicting values and beliefs. Together with our analytical framework, this concept helps explain why some missions gain broad support while others face resistance, offering enhanced theoretical understanding and actionable insights for policymakers.

After this introduction, the paper proceeds to introduce our analytical framework (Section 2) and describe our Q methodological research design (Section 3). Thereafter, we present our empirical results, while highlighting different varieties of disagreement (Section 4). In the end, we discuss methodological, theoretical and policy implications of our findings and offer concluding remarks (Section 5).

## 2. Towards a framework of disagreement in transformative policy missions

The overarching promise of a new generation of transformative policy missions is relatively well-defined. According to Mazzucato (2016, 2018a), they should address grand challenges by being bold, measurable, cross-disciplinary, and open to multiple solutions. Adding to this understanding, Larrue (2021) argues that missions should be defined as a "coordinated package of policy and regulatory measures tailored specifically to mobilize science, technology and innovation in order to address well-defined objectives related to a societal challenge, in a defined timeframe" (p. 8). In addition, Wittmann et al. (2021) highlight that the ambition to achieve transformative change in relation to a societal problem differs from historical missions oriented toward scientific and technological breakthroughs. The authors agree that many types of policies can be classified under the umbrella of missions, from overarching programs to theme-specific initiatives (Mazzucato, 2018a; Larrue, 2021; Wittmann et al., 2021). Indeed, it would be challenging to develop "one-size-fits-all" criteria or find a mission that "ticks all the boxes", not least due to the context-specific influences of existing legislation in different countries (Janssen et al., 2023).

A defining feature of transformative policy missions is that innovation is seen not as a goal, but as a means for solving societal problems (Mazzucato, 2018a; Schot and Steinmueller, 2018). This new perspective on innovation policy – sometimes referred to as the "third frame" (Schot and Steinmueller, 2018) – marks a significant shift from previous paradigms by calling for more active and explicit government intervention (Kanger et al., 2020), emphasizing policies that address system failures related to directionality and reflexivity (Weber and Rohracher, 2012), and advocating the phase-out of unsustainable technologies and practices (Kivimaa and Kern, 2016). While traditional science, technology, and innovation policy has not been replaced, the third frame has gained momentum and is increasingly used to address climate change and other grand challenges (European Commission, 2020; Hill et al., 2022; OECD, 2022).

Although the theoretical understanding of transformative policy missions is still under development, a salient idea is that they are needed to mobilize resources and actors necessary for addressing important societal challenges. However, if missions are imposed in a top-down manner and build momentum without securing legitimacy among key stakeholders, they are likely to fuel resistance, criticism, and conflict (Janssen et al., 2021; Klerkx et al., 2025). The main cause of such contestation is that missions set ambitious and specific goals related to "wicked problems" – a term used widely in policy and planning literature to describe problems that have many causes, are difficult to define clearly, require a combination of indefinite solutions, and where attempted interventions may generate unforeseen consequences (Rittel and Webber, 1973). This means that problems and solutions can be interpreted and appraised differently, while multiple development pathways are often feasible (Andersson et al., 2021). This creates a broad space for different viewpoints as transformative change tends to produce short-term winners and losers. For example, while most EU member states support the 2050 carbon neutrality goal, debates persist over intermediary targets, technological solutions, and policy interventions to reach this goal (Hassler, 2023; Nilsson et al., 2004; Kander et al., 2015).

Building on these concerns, recent literature has begun exploring contestation in transformative policy missions, along with emerging strategies to navigate diverging opinions. For example, Wanzenböck et al. (2020) explain that stakeholders can disagree about the mission per se (e.g., the definition and importance of a problem) and about appropriate solutions to the societal problem in focus (e.g., the feasibility and potential of different technologies). Meanwhile, Janssen et al. (2023) highlight that missions may be contested from multiple levels, ranging from the strategic position of government ministries to the operational level of scientists, companies and citizens. In addition, as pointed out by Bergek et al. (2023), the subject of debates is not only the problems and solutions associated with missions, but also what constitutes appropriate policy intervention.

This echoes foundational insights from evolutionary and institutional economics, which emphasize how firms compete not only through technological variety (Nelson and Winter, 1982; Abernathy and Utterback, 1978), but also over the framing of problems and the shaping of institutional structures (North, 1990). These dynamics have been further elaborated in the innovation systems literature, which highlights the collective, path-dependent, and institutionally embedded nature of innovation (Carlsson and Stankiewicz, 1991; Lundvall, 1992). More recent contributions to the sustainability transitions literature extend this view by conceptualizing contestation as emerging from structural tensions between competing socio-technical configurations, value systems, and governance arrangements (Madsen et al., 2022; Markard et al., 2021; Heiberg et al., 2022). This research suggests that contestation in missions concerns deep normative and institutional commitments that shape which futures are considered legitimate and desirable. In this sense, it is not simply a matter of different viewpoints among isolated stakeholders, but rather one that appears between organized actor groups embedded in different socio-technical configurations. These groups often mobilize around specific solutions, narratives, and policy preferences, making contestation both structural and strategic in nature.

A key distinction between contestation in transformative policy missions and in evolutionary processes is that directionality is defined ex ante, rather than emerging incrementally ex post. This makes it particularly important to examine the ways in which stakeholders disagree about problems, solutions, and interventions. Indeed, diverging perspectives shape how missions evolve, not only when disagreement leads to outright contestation about the institutional landscape, but also when it relates to more subtle differences in opinions, values and beliefs. This is why we here focus on the underlying disagreement, rather than contestation as such.

Furthermore, it is crucial to distinguish factual and normative dimensions. This idea dates back to Hume (1739), who identified the logical dichotomy between factual beliefs (what is) and normative values (what ought to be). Later scholars such as Weber (1949) maintained that factual and normative statements are distinct, but showed that values guide the selection and interpretation of facts. More recently, scholars have emphasized that beliefs and values are interdependent (Putnam, 2004; Jasanoff, 2004), while arguing that economic theory overlooks ethical and normative dimensions, thereby failing to capture the complexity of human behavior and diverse motivations (Sen, 1987; Flyvbjerg, 2001; Putnam, 2004).

In the context of transformative policy missions, normative disagreement is not just a reflection of plural perspectives but a divergence that may result in structured political struggles between competing socio-technical configurations and institutional interests (Madsen et al., 2022). This contestation plays out both through overt debates and through subtle power dynamics over problem framings, the prioritization of solutions, and the legitimacy of interventions, in the end shaping which narratives gain traction, who is included or excluded from decision-making, and how missions unfold over time. When normative disagreement is spatially embedded (Uyarra et al., 2025), it can be amplified by regional marginalization and political alienation (Dijkstra et al., 2020), particularly in economically lagging regions. In such contexts, entrenched normative disagreement may fuel resistance to mission goals (Yazar & Haarstad, 2023).

Without distinguishing factual and normative disagreement as interdependent yet distinct phenomena, policy responses to stakeholder conflicts are likely to rely on tools such as experimentation, information, dialogue, and coordination. These are better suited to address factual disagreement and may even deepen misalignment, exclude key actors, and undermine legitimacy in situations characterized by diverging values (Zack, 2001; Olsson & Jerneck, 2018). Indeed, normative disagreement challenges the very framing and legitimacy of missions, requiring fundamentally different policy responses, including mechanisms for redistribution and compensation.

This contrasts a common assumption in the literature on transformative policy missions, namely that governments should address diverging perspectives by fostering alignment and broad compromise. Janssen et al. (2021) emphasize that aligning interests and including multiple perspectives is key to providing directionality, while Kivimaa (2022) highlights co-creation of visions as crucial for inclusive missions. Since missions are beyond the control of any single actor, shared narratives and new collaborations are often seen as necessary. However, this focus on alignment may be overstated, as some scholars argue that deep-rooted differences in values and philosophies make consensus unrealistic (Ferraro et al., 2015; Ritala, 2023). Others call for the deliberate destabilization of unsustainable industries, suggesting that certain conflicts cannot, and should not, be reconciled (Kivimaa and Kern, 2016; Kuokkanen et al., 2018).

Against this theoretical background, we build on existing literature (Andersson & Hellsmark, 2024; Bugge et al., 2021; Wanzenböck et al., 2020) and results from our empirical research (Section 4) to introduce an analytical framework that distinguishes the *topic* and *type* of disagreement (Table 1). Topic differentiates problems, solutions, and interventions, while type separates factual and normative dimensions. For instance, disagreement related to problems can be factual and relate to questions such as whether industrial emissions are increasing rapidly enough to justify urgent action or whether intermediate climate targets effectively drive innovation. However, it can also be normative, reflecting different views on which societal goals should take precedence, such as prioritizing climate mitigation versus economic growth, energy security, or social equity. Along the same lines, disagreement about solutions is factual when actors question the technical feasibility, scalability, or cost-effectiveness of certain technologies, such as whether hydrogen-based steel production can be deployed in time to meet climate goals. It can also be normative and focus on broader societal implications, such as whether solutions reinforce existing industrial power structures or produce unintended environmental or social harms (e.g., increased land use or resource extraction). Interventions, finally, can generate factual disagreement regarding which policy instruments (e.g., subsidies, carbon pricing, procurement) are most effective at overcoming barriers to innovation, but they may also spark normative debates about the appropriate role of the state in industrial transformation, such as whether public funds should support incumbent firms or instead prioritize equity, regional cohesion, or democratic participation.

While our analytical framework necessarily simplifies the complexity of real-world disagreement, it offers a more precise conceptualization than existing theory. We add interventions as a third dimension to the problem–solution space associated with missions (Wanzenböck et al., 2020; Wiarda et al., 2023) to highlight disagreement about how policymakers should promote solutions rather than about the solutions themselves (Bergek et al., 2023). While acknowledging the interdependence of beliefs and values

**Table 1**
Varieties of disagreement in transformative policy missions. Based on Andersson and Hellsmark (2024), Bugge et al. (2021) and Wanzenböck et al. (2020), but further developed for the purposes of this paper.

| | | Type of disagreement | |
|---|---|---|---|
| | | Factual | Normative |
| **Topic of disagreement** | *Problems* | How can problems be understood? | How should problems be understood? |
| | *Solutions* | How can goals be reached? | How should goals be reached? |
| | *Interventions* | How can solutions be promoted? | How should solutions be promoted? |

(Putnam, 2004; Jasanoff, 2004), we also make the important distinction between factual and normative disagreement (Hume, 1739; Weber, 1949). These additions help to identify how opinions differ between stakeholders, which is crucial for the design and implementation of mission-oriented policymaking. The following sections demonstrate the value of our analytical framework as a heuristic for analyzing transformative policy missions.

## 3. Methodology

Our empirical research is based on Q methodology, which was introduced in 1935 as a systematic way to study human subjectivity in psychology (Brown, 1980; Stephenson, 1953). Since then, it has spread to other disciplines and been applied to research on a wide variety of topics, including health care and medicine (Akhtar-Danesh et al., 2008; Eccleston et al., 1997), ecological economics (Barry and Proops, 1999), political science (Brewer et al., 2000; Dryzek and Berejikian, 1993), human geography (Eden et al., 2005; Robbins et al., 2000), environmental management and planning (Ellis et al., 2007; Webler et al., 2001), project management (Gilbert et al., 2017), tourism management (Tan et al., 2014), and sustainability transitions (Bauer, 2018; Cairns and Stirling, 2014). Q studies employ a data reduction technique that enables the representation of subjective positions held by a group of individuals in terms of a smaller number of contrasting narratives – that is, storylines that actors use to navigate complex issues (Roe, 1994). These are identified through a standardized research process in which purposively sampled participants sort statements according to a systematic procedure (Brown, 1980; Watts and Stenner, 2012). The resulting data are then analyzed statistically, producing quantitative factors that explain variation across participants. In the end, these factors are interpreted qualitatively and articulated as narratives that represent distinct perspectives.

We chose Q methodology in response to calls for greater methodological diversity in sustainability transitions research (van den Bergh, 2021). While qualitative studies using thematic content analysis have provided valuable insights into attitudes and perspectives relevant to socio-technical change, they are often criticized for a lack of precision and analytical transparency (Svanberg et al., 2025). Q methodology combines the rigor and replicability of quantitative analysis with the interpretative flexibility and richness offered by qualitative approaches. This makes it a useful tool for sustainability transitions research, as shown by previous Q studies on narratives related to, for example, electrification (Phan et al., 2025), the construction industry (Wiarda et al., 2023), the bioeconomy (Bauer, 2018), carbon capture and storage (Setiawan and Cuppen, 2013), geoengineering (Cairns and Stirling, 2014), hydrogen technology (Baxter and Hacking, 2015) and photovoltaics (Chang et al., 2019; Späth, 2018). Recent comparative applications, such as Steen et al. (2024) on decarbonization challenges in Sweden and Norway, also demonstrate Q methodology's potential to uncover context-dependent patterns of stakeholder disagreement across national policy environments.

### 3.1. Developing a list of statements (q-sample)

In this study, the list of statements used in the interviews (q-sample) consists of possible challenges in the decarbonization of Swedish industry. To construct the q-sample, we began by collecting many statements that capture a wide range of viewpoints, using a combination of inductive and deductive approaches. First, we conducted three expert interviews focused on generating statements.[3] Second, we added statements based on a review of empirically-oriented scientific literature (e.g., Åhman et al., 2017; Bataille et al., 2018; Kushnir et al., 2020), policy reports (e.g., Energy Transitions Commission, 2018; Material Economics, 2021; Swedish Energy Agency, 2017), industry roadmaps developed within the Fossil Free Sweden initiative (Fossil Free Sweden, 2021) and newspaper articles. Third, we added statements by drawing on insights from theoretical literature on innovation and sustainability transitions (e.g., Bergek et al., 2008; Geels, 2002; Hekkert et al., 2007). This resulted in a first list of 207 statements.

A preliminary q-sample was constructed to reflect the initial statements, while considering the practical constraints of the interview process and analysis. This involved grouping statements into distinct themes (e.g., infrastructure, policy, technology) to merge overlaps and select a diverse subset. The q-sample and interview instructions were reviewed by colleagues,[4] resulting in changes to both. Subsequently, the preliminary q-sample was used in three test interviews with experts. Based on their feedback, the q-sample was revised for clarity, ultimately consisting of 56 statements such as "There is too little experimentation with new solutions", "The climate transition will harm Swedish exports", and "There is a lack of collaboration among public and private actors" (see Table A.1 in the Appendix for a complete list of statements). Since the study is focused on Swedes, the q-sample was initially formulated in Swedish to prevent language-related misunderstandings. Interviews and narratives were also developed in Swedish. The statements and narratives were translated for this paper.

### 3.2. Identifying participants (p-sample)

The study participants (p-sample) included stakeholders knowledgeable about decarbonization, such as employees from industrial companies or policymakers, researchers, and opinion-builders. Drawing on previous studies, we selected participants who can meaningfully evaluate statements about challenges, while aiming to create a p-sample that captures diverse viewpoints. In addition, we adopted a snowballing approach, where participants in early interviews we are asked to identify other potential participants with

[3] The expert interviews were conducted with Philip Johnsson (Professor at Chalmers University of Technology), Max Åhman (Associate Professor at Lund University) and Thore Berntsson (Professor Emeritus at Chalmers University of Technology) in June 2021.

[4] These colleagues were not involved in other parts of the study and do not have expert knowledge on the decarbonization of Swedish industry.

diverging opinions.

The final p-sample consisted of 25 individuals (see Table A.2 in the Appendix),[5] representing three NGOs working with both environmental protection and labor rights; five government agencies focused on energy, the environment and indigenous people; twelve firms from different industry sectors; four universities and research institutes engaging with both technological development and policy and innovation studies; and one firm from the financial sector.[6]

### 3.3. Conducting interviews

Q interviews were conducted via video conference and supported by Q Method Software (Lutfallah and Buchanan, 2019), which provides an online interface for administering and analyzing Q sorts. This enabled us to offer guidance during the sorting procedure and end the interviews with open questions to obtain complementary qualitative data. After a brief introduction, participants were asked to share their screen and access the online interface. To provide an overview of the q-sample and facilitate the sorting procedure (Watts and Stenner, 2012), participants begun by pre-sorting each statement into the categories "Less important challenge", "Quite important challenge", and "Very important challenge". They then conducted the main sorting where each statement was ranked on a scale from "Less important challenge" (-5) to "Very important challenge" (+5) according to a forced distribution matrix (Fig. 1). Lastly, they were asked open questions focused on the rationale behind their sorts and their views on action required to address key challenges. The interviews were recorded, and key reflections were transcribed. This enabled the authors to develop a shared understanding of qualitative impressions and data. Each interview lasted about one hour.

### 3.4. Analyzing and interpreting data

Q methodology applies statistical methods to analyze correlations between participants' sorts, which allows for extracting and characterizing factors that represent shared viewpoints.[7] Following Watts and Stenner (2012, 2005), we conducted Centroid Factor Analysis based on Spearman correlations and used the Kaiser-Guttman criterion (Guttman, 1954; Kaiser, 1960) to obtain four factors with eigenvalues above 1.00 and at least two significantly loading sorts (Table 2).[8] Factors were rotated using the Varimax method to enhance interpretability.

The extracted factors together explained 41% of the study variance, which is consistent with expectations in Q methodology (Watts & Stenner, 2012). However, Factor 3 and 4 explained relatively little variance, and Factor 1 and 3 showed an unusually high correlation (0.60). While this raised statistical concerns, we retained all factors as they capture distinct narratives relevant to our research (Brown, 1980; Stephenson, 1953). Of the 25 sorts, 21 loaded significantly onto one factor, while four represented deviating perspectives (see Table A.3 in the Appendix). Factor 3 was bipolar, with one participant negatively loading, but splitting it into two interpretations was not justified due to the limited number of negative loadings and Kaiser-Guttman's two-participant criterion.[9]

To interpret the factors, we calculated weighted z-scores and statement rankings (see Table A.1 in the Appendix), which revealed the meaning of the factors by describing idealized sorts that perfectly adhere to the perspectives represented by each factor. These quantitative results were interpreted qualitatively to articulate the perspectives represented by each factor as a narrative. To support this analytical step, we constructed crib sheets that highlight key differences between factors in a systematic way (Watts and Stenner, 2012). Based on the idealized sorts associated with each factor, the crib sheets highlight statements ranked as least and most important challenge (+5 and -5 in the forced distribution matrix, see Fig. 1) as well as those ranked notably higher or lower compared to other factors. This enabled us to attend to important statements in the middle of the distribution when interpreting the quantitative results. In addition, we used the participants' reasoning throughout the sorting procedure and answers to open questions during interviews to further understand their reasons for ranking statements in a particular way. This structured approach enabled us to develop rich and reliable narratives that capture the meaning of each factor. Lastly, the narratives were compared and analyzed abductively (Dubois and Gadde, 2002); empirical results obtained through Q methodology gave theoretical insight and inspired our analytical framework, which in turn enabled further empirical analysis in an iterative process.

## 4. Disagreement in the decarbonization of Swedish industry

The Q methodology described in the previous section enabled us to identify and articulate narratives that represent shared

[5] The p-sample was accordingly roughly half the q-sample, which is in line with general Q methodological recommendations (Watts and Stenner, 2012).

[6] Most stakeholders contacted for the study were willing to participate, except for a few individuals associated with a particularly critical perspective. In Section 5, we discuss what this implies for our findings.

[7] Q methodology can thus be seen as an inverted form of the traditional R technique, which is concerned with correlations among specific traits rather than entire individuals (Brown, 1980).

[8] The eigenvalue describes how much of the total variance of all Q sorts a factor explains. Since factors with eigenvalues less than 1 explain less variance than a single Q sort, they may not represent a shared perspective among the participants.

[9] The participant's loading of -0.38154 was significant at $p<0.05$ and captured a majority of common variance. Yet, it remained close to the significance limit and was in fact the lowest among the significant loadings observed in our data, which are additional reasons for not splitting the factor.

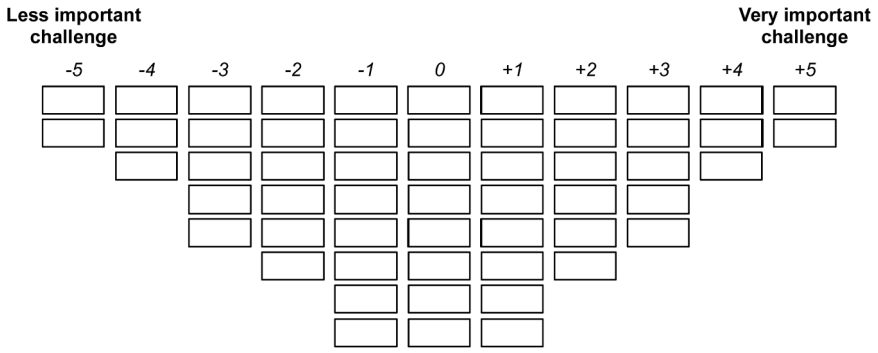


**Fig. 1.** Forced distribution matrix in which participants were asked to place, and thus rank, 56 statements that describe potential challenges in the Swedish transition to zero emissions in industry.

**Table 2**
Summary of extracted and rotated factors.

| | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
|---|---|---|---|---|
| Eigenvalue | 5.92 | 1.63 | 1.20 | 1.13 |
| Defining Q sorts | 7 | 4 | 7 | 3 |
| Explained study variance | 24% | 7% | 5% | 5% |
| Standard error of factor z-scores | 0.19 | 0.24 | 0.19 | 0.28 |
| Factor correlations (F1/F2/F3/F4) | 1/0.09/0.60/0.33 | 0.09/1/0.12/0.01 | 0.60/0.12/1/0.40 | 0.33/0.01/0.40/1 |

viewpoints among stakeholders to the decarbonization of Swedish industry. Below, we treat these narratives as empirical lenses that reveal where and how factual and normative disagreement manifests across problems, solutions, and interventions. We begin by describing the narratives, then analyze the viewpoints they represent, and lastly identify varieties of disagreement in relation to the analytical framework introduced in Section 2.

### *4.1. Four contrasting narratives*

The analysis resulted in four narratives – one for each identified factor (Table 2). Below, we elaborate on the narratives' characteristics, while providing references to quantitative results (i.e., statement rankings) and qualitative interview data (i.e., participant IDs).

#### *4.1.1. Narrative 1 – weak networks and collaboration*

Narrative 1 (based on Factor 1 in Table 2) is quite positive about the potential for reaching zero emissions by implementing new production technologies (S21, -4; S12, -4; S10, -3; S51, -2) and embraces the new competitive path this opens up for domestic firms (S23, -5; S40, -5; P19; P18). Challenges are rather found in the weak interaction and engagement among non-industry actors such as policymakers, customers, investors, and universities, as well as the somewhat unsupportive environment, plagued by lacking material infrastructure. The narrative emphasizes that the electricity system is unfit to support the mission (S44, +5; S41, +5) and highlights the lack of circular flows needed to provide renewable feedstock to industrial processes (S42, +3). There is a concern that high-level policymaking fails to introduce sufficient incentives for decarbonization (S34, +4) and thereby establish clear "rules of the game" (P18). It is also argued that policymakers should take a more active role in inspiring, guiding, and coordinating actors (S32, +2; S35, +3; S56, +3). In addition, the narrative highlights how poor links between universities and industry result in low availability of knowledge and competence (S16, +4; S18, +1; P6; P18; P19; P21), while raising to a certain unprogressiveness among customers and investors (S1, +1; S2 +2; S27, +1).

What Narrative 1 points to is accordingly weaknesses related to the systemic nature of innovation. New technologies enable decarbonization, bringing a competitive advantage to domestic firms, but industrial actors struggle to reap opportunities due to an unsupportive environment and weak networks. The narrative urges policymakers to address infrastructural problems and establish the "rules of the game", while firms are encouraged to be more proactive and collaborative to better understand and address mutual needs in the transition (P19; P18; P21; P17; P6).

Seven participants have views that are most in line with Narrative 1 (i.e., their Q sorts load significantly onto Factor 1). Four of them (P14; P17; P18; P19) are business representatives from a utility provider, chemical company, machinery manufacturer, and decarbonization-focused project developer. These organizations are all deeply engaged in innovation activities driven by the zero emissions goal, which may explain the positive attitude towards the mission and the emphasis on systemic aspects that influence what industry actors can achieve. The remaining participants are two policy representatives (P6; P7) with an active role in promoting decarbonization and one energy policy researcher (P21) with long experience from leading roles in the public sector. Here as well,

there is an inside-out perspective on the mission, which is well in line with the narrative.

#### 4.1.2. Narrative 2 – no clear technological solution

Narrative 2 (based on Factor 2 in Table 2) highlights challenges related to the increasing need for renewable electricity (S41, +5), including the failure of policymakers to address this problem (S36, +5; P9). However, the distinguishing viewpoint is that the mission does not have a clear technological solution. There is a concern that society places an excessive belief in a limited set of immature technologies (S13, 1; S51, +2). Some of these, such as solutions based on hydrogen and biomass, have a smaller potential to reduce emissions than most actors think (S14, +4; S10, +2). And while the long-term potential of electrification and carbon capture is acknowledged (S11, -1; S12, -1), their large-scale implementation is beyond reach due to the lack of infrastructure and the uncertain access to technical components (S41, +5; S44, +4; S45, +2; S46, +3; P9). Furthermore, the narrative highlights that these technologies come with grave uncertainties (S17, +1, S52, +3) and refrains from ruling out that the mission may threaten the competitive position of domestic firms (S23, -3). Perhaps as a result, it also expresses some scepticism towards the goal of reaching zero emissions by 2045 (S21, +2), at least with the current solutions being pursued. In fact, the slow progress is not seen as particularly problematic and the urgency of reducing emissions further is somewhat downplayed, especially since domestic firms already have a smaller climate footprint than their international competitors (S29, -5; S22, +4; S54, 0; P9; P20).

What characterizes Narrative 2 is accordingly a pronounced scepticism, particularly towards technological possibilities but also in relation to the zero emissions goal as such. Industrial actors are mobilizing to accomplish the mission and increasingly willing to invest in low-carbon solutions (P23), but there are simply no technologies that make it possible to reach zero emissions in time. This is aggravated by the failure of policymakers to ensure that renewable electricity, power grids, and other infrastructure is in place to support to the mission.

Four participants have views that are most in line with Narrative 2 (i.e., their Q sorts load significantly onto Factor 2). Three of them (P9, P10, P20) represent firms in the metals, cement, and mining industries. The common denominator for these actors is that they pursue solutions quite far from implementation, where success is largely dependent on factors they cannot control (i.e., infrastructure development, electricity provision, and environmental permits). Nevertheless, the participants express a somewhat surprising perspective, given that they are all involved in projects aiming to advance the same technologies which are seen as insufficient. The remaining participant (P23) adhering to the narrative represents a bank involved in financing the development and implementation of low-carbon technologies. Here, the emphasis is rather on a recent shift in the financial sector where other values, such as clean air and an improved local environment, has started to impact investment decisions. However, from the perspective of this participant, there is a lack of projects ready to receive substantial funding, which is also in line with a sceptical stance against current technological possibilities.

#### 4.1.3. Narrative 3 – lack of support from national policymakers

Narrative 3 (based on Factor 3 in Table 2) also highlights challenges related to the provision of renewable electricity (S36, +5; S44, +3), but reaching net zero emission by 2045 is seen as realistic (S21, -5). The mission may increase the competitiveness of industry (S23, -5) and key technologies are perceived as viable possibilities (S10, -3; S11, -2; S12, -4; S14, -2). What is emphasized is rather problems related to political leadership, policy regulation, and public investments. Since firms act on global and highly competitive markets (S7, +2), they need support to successfully decarbonize. The mission may also have negative consequences for some stakeholders, and these should be compensated through policy to ensure an equitable development and avoid a backlash in public support for climate goals (S40, +3; P5; P22). In this context, the narrative highlights the lack of political direction and points to the need for strategic coordination, strengthened market incentives, and a more active use of public procurement to create demand for low-carbon products (S32, +4; P5). It points to policy regulations hindering the implementation of new technologies, particularly the slow environmental permitting process (S36, +5) which fails to account sufficiently for climate goals (S37, +3). And it sees a need for more public funding in the form of investment subsidies, credit guarantees, as well as support to research, development, and demonstration activities (S38, +2; S39, +3). However, less emphasis is put on the lack of global regulations (S34, +1) since an international market for low-carbon products is materializing already today. In addition, the narrative questions the current focus on reducing emissions by implementing new production technologies and highlights the need to reduce demand and develop circular solutions (S9, +4; S42, +4).

Narrative 3 thus revolves around the role of national policymaking. Although the mission is associated with possibility and opportunity, political decisionmakers fail to provide sufficient guidance and support to actors striving to develop and implement new solutions. The passive stance of policymakers hinders the implementation of low-carbon technologies ready to be scaled-up. This may not only result in failure to decarbonize in time, but also means that domestic firms will not be able to reap the benefits of doing so.

Six participants from a wide range of organizations have views that are most in line with Narrative 3 (i.e., their Q sorts load significantly onto Factor 3). Two of them (P5, P22) are researchers active in collaborative innovation projects, another two (P24, P25) represent industrial firms producing heat, power, and fuels, one works for a government agency (P12), and the last (P3) represents a left-wing policy think-tank. Given the political views of the last participant, it is easy to assume why this person highlights problems

related to policymaking. But for the remaining five participants, it is difficult to discern a pattern that could explain the dominance of this narrative. It should also be noted that one participant (P8) seemingly has views that are most in line with the opposite views of Narrative 3 (i.e., their Q sort has a weak but significant negative loading onto Factor 3).[10]

#### 4.1.4. Narrative 4 – trade-offs and negative consequences

What is most salient about Narrative 4 (based on Factor 4 in Table 2) is that the potential negative consequences of the mission are emphasized as the main challenge. There is a grave concern that the current direction will be detrimental to cultural values and local ecosystems, implying difficult trade-offs between climate goals and other objectives related to the local and global environment (e.g., biodiversity) (S24, +5; S25, +5). Efforts to achieve zero emissions are seen as overly focused on the development and diffusion of new production technologies based on renewable energy and biomass, while failing to address the need for circularity and promote more radical system-level change (S9, +4; S42, +4). There is also a sense that consumption culture, anthropogenic values, fact resistance, and growth-oriented economic governance constitute important barriers to achieving sustainability in a broader sense (P2; P13). At the same time, however, concerns about negative consequences of the mission do not seem to apply to the competitiveness of Swedish industry (S23, -5), even though it is emphasized that the increasing need for renewable electricity, biomass, and mined materials may result in land-use conflicts and harm rural businesses and lifestyles (S41, +4; P2; P16).

Narrative 4 thus represents a stance that questions the directionality of decarbonization. Society may be on track towards solving the climate crisis but does so without addressing fundamental problems in the current socio-economic system. As a result, other social and environmental problems are created or aggravated. The challenge is accordingly to shape decarbonization in a way that strikes a better balance between multi-dimensional sustainability objectives. This in turn requires radical social and cultural change beyond the development and diffusion of low-carbon production technologies.

Three participants have views that are most in line with Narrative 4 (i.e., their Q sorts load significantly onto Factor 4). One of them (P2) represents a policy organization for Sweden's indigenous population, whose culture is strongly intertwined with ancient reindeer herding practices, while another (P13) represents an environmental NGO. The interests promoted by these organizations (i.e., business and culture dependent on local ecosystems and broad environmental objectives) are strongly in line with the narrative. In contrast, the third participant (P16) represents a regional government administration. While regional governments do emphasize a broad view on sustainability, a slightly different perspective highlighting other types of problems could have been expected.

### 4.2. Comparative analysis and varieties of disagreement

While the narratives offer contrasting perspectives, they have two common traits. First, the need for large amounts of renewable electricity is seen as a major challenge in all four narratives (S41). Even though the technological solutions in focus of decarbonization are certainly reliant on large-scale electrification, the overwhelming agreement also suggests that the participants may have been influenced by the public debate. During the period when interviews were conducted, problems in the Swedish electricity system (e.g., power supply, transmission capacity, and increasing prices) were a salient topic, both in relation to the demand created by low-carbon technologies and increasing prices due to the Russian invasion of Ukraine in February 2022. Second, none of the narratives see decarbonization as something that will undermine the competitive position of Swedish industry (S23). In fact, Narrative 1 and 2 go even further, emphasizing that the mission is an opportunity rather than a threat to domestic firms. These common traits can be seen as parts of a meta-narrative (Roe, 1994) that most actors adhere to, even though their perspectives differ in other dimensions.

What makes the narratives different is the type of challenges that are put forth as most important. Narrative 1 raises challenges related to networks and collaboration, but also highlights the lack of infrastructure and the unsupportive institutional environment. Weaknesses at the system-level (Bergek et al., 2008; Edquist, 1997) thus take center stage, while the capacity to address problems is mainly found in the broader context (e.g., global carbon pricing and new "rules of the game") (Bergek et al., 2015). In contrast, Narrative 2 emphasizes challenges related to technology, together with the availability of related knowledge and competence, while Narrative 3 focuses on the lack of policy support and the role of policymakers as key actors with the capacity to address problems. Both Narrative 2 and 3 thus emphasize weaknesses of specific elements (i.e., technology and policy), albeit in slightly different ways (i.e., source of problems vs. source of solutions). Lastly, Narrative 4 is particularly concerned with trade-offs that result in negative consequences given the current pathway to zero emissions and thereby highlights a possible directionality failure (Weber and Rohracher, 2012).

In relation to the analytical framework introduced in Section 2, our results do not show any significant disagreement related to the problems associated with the mission. On the contrary, the narratives, as well as the individual participants, all acknowledge the need to decarbonize. However, in relation to the other narratives, Narrative 2 downplays the urgency of decarbonization (S21, +2) and highlights the need for a global rather than national perspective (S22, +4). This represents a slightly deviating view on how the societal problem is translated to concrete goals, which could potentially lead to more explicit disagreement in the future.

As expected, the main disagreement is instead found in relation to solutions. Narrative 1 and 3 consider the dominant solution pathway, understood as the general direction along which decarbonization is unfolding, to be both realistic and desirable. This

[10] As described and motivated in Section 4, we refrain from elaborating on an interpretation of this perspective, which can be seen as the polar opposite of the one described here (Watts and Stenner, 2012). Notably, this opposite narrative would likely consider current policy interventions problematic in that they shape developments too much and in the wrong direction, while emphasizing the capacity of industry to achieve decarbonization on their own terms (P8).

represents a generally positive attitude, even though the two narratives highlight challenges that must be overcome. In contrast, Narrative 4 adopts a critical attitude that considers the dominant solution pathway undesirable. The main problem is not that solutions fail to develop and diffuse, but rather that they bring other social and environmental problems. Implicit in this line of thinking is the need for a radical transformation of socio-technical systems rather than merely replacing production technologies. This viewpoint reflects tensions arising from perceived trade-offs between climate action and other social or environmental objectives, indicating that the divergence between Narrative 4 and the other narratives is grounded in normative disagreement. Narrative 2 also dismisses the dominant solution pathway, but for different reasons. Technological solutions are not considered undesirable but unrealistic, since they are perceived as immature and insufficient. This is a skeptical attitude, which highlights factual disagreement about the potential and development phase of different technologies, rather than different underlying normative positions. Although none of the narratives are genuinely negative in considering the current direction to be both undesirable and unrealistic, this viewpoint may exist and pose a significant challenge for the success of missions in other contexts. In Fig. 2, we illustrate disagreements related to solutions by positioning the narratives in a conceptual space constructed by two axes that describe whether the dominant solution pathway is perceived as (i) realistic or unrealistic and (ii) desirable or undesirable.

There is also some disagreement related to interventions needed to accelerate developments along a given solution pathway, where Narrative 1 and 3 call for different types of policymaking. Narrative 1 highlights the importance of European and global regulations (S34, +4; S35, +3), while Narrative 3 rather emphasizes the need for guidance and support from Swedish policymakers (S36, +5; S37, +3; S39, +3). The disagreement is primarily based on diverging factual beliefs, but since Narrative 3 focuses much more on the need for active policymaking at the national level, there may also be different normative ideas about the role of government at play. In addition, it should be noted that Narrative 3 and 4 are not associated with any clear views on interventions, since their emphasis is on skepticism and criticism, respectively, towards solutions. The identified varieties of disagreement between the narratives are illustrated in Fig. 3. In the next section, we proceed to discuss the implications of these findings.

## 5. Discussion and policy implications

The narratives identified and analyzed in the previous section highlight contrasting perspectives on the decarbonization of Swedish industry and reveal different varieties of disagreement (Fig. 3). These include disagreement about whether the dominant solution pathway is realistic, reflecting different factual beliefs about the potential and maturity of key technologies. Another variety of disagreement concerns the desirability of the dominant solution pathway, where the narratives adopt contrasting positions based on differing normative values. In addition, there is factual disagreement about how policy interventions can accelerate developments along the dominant solution pathway.

Our research case thus demonstrates some, but not all, varieties of disagreement outlined in the analytical framework introduced in Section 2. We did not identify any explicit disagreement about the problem that defines the mission, although slightly divergent positions can be observed and may evolve into more salient divergence over time. This is somewhat expected given that the mission enjoys broad support by politicians, businesses, and citizens. Nonetheless, public debate in Sweden includes critical voices – including

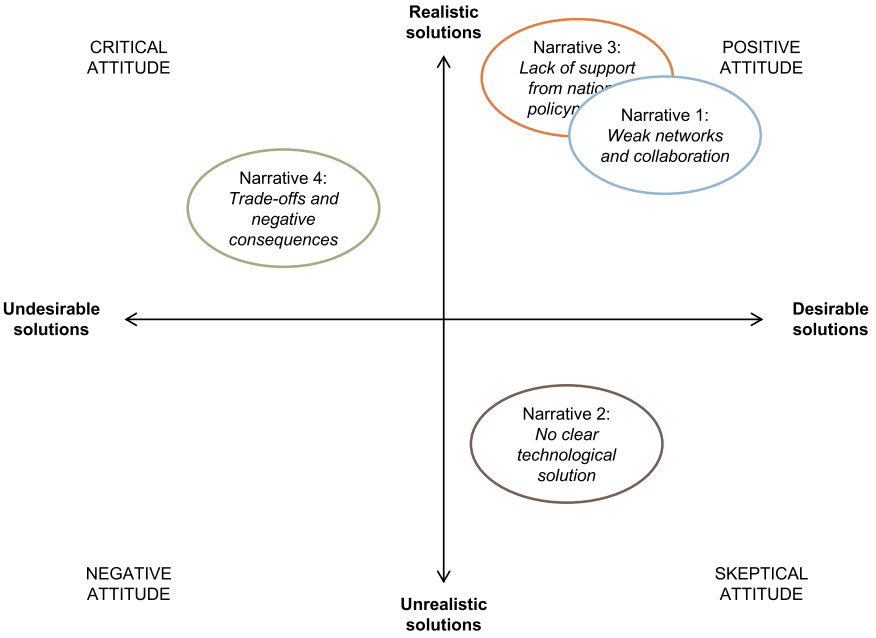


**Fig. 2.** An illustrative overview of disagreements between the narratives about solutions. Based on qualitative interpretation of factors as well as on their average z-scores for statements associated with the two axes (Realistic/Unrealistic, S21; Desirable/Undesirable, S23-S26, S28).

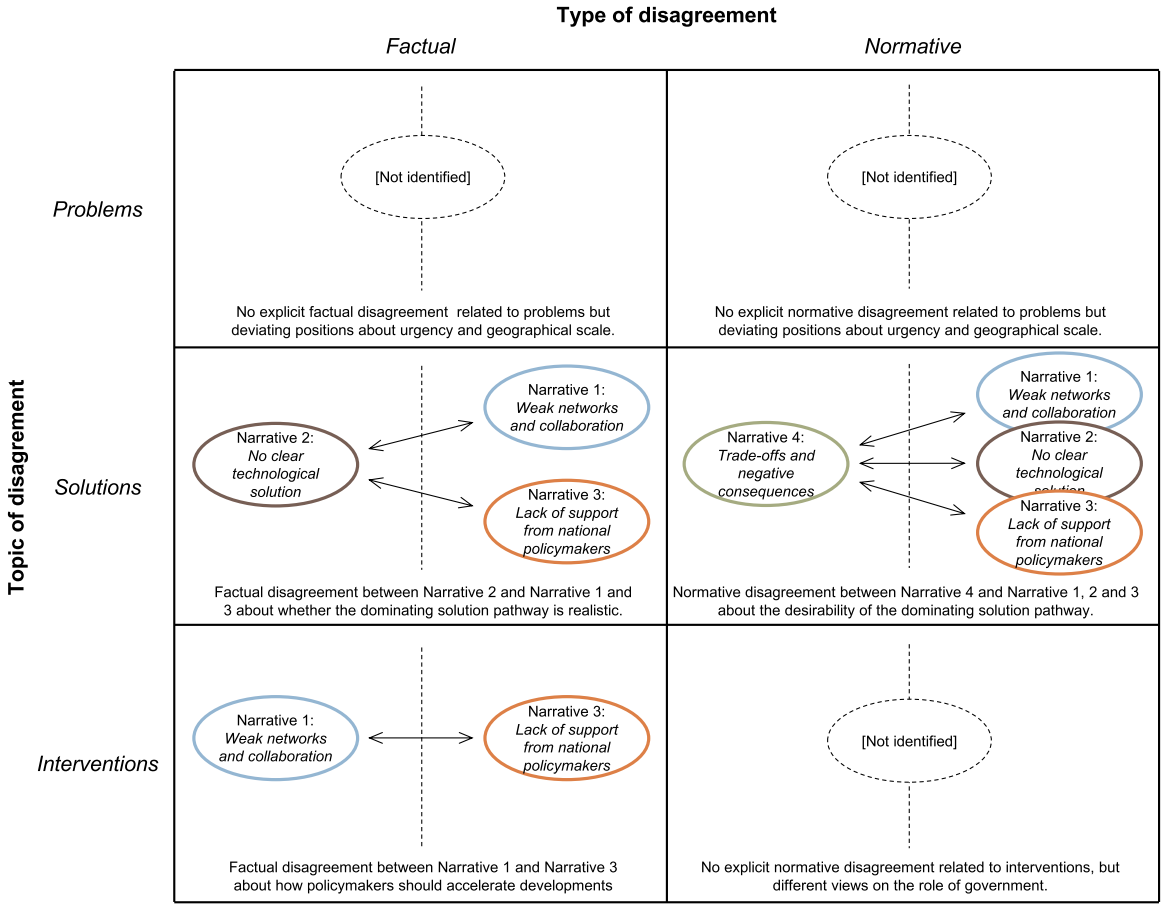


**Fig. 3.** An illustrative overview of the identified varieties of disagreement between the narratives.

researchers and commentators – who question both the urgency of climate action and the prevailing focus on promoting hydrogen-based steel production through large-scale state subsidies (Gärdebo and Sandström, 2024; Sundén, 2024). While we attempted to include individuals representing such perspectives in our p-sample, particularly those associated with market-liberal think tanks advocating minimal government intervention, we did not receive any response to our invitations. This limits the extent to which this critique is reflected in the empirical material. However, the institutional affiliation of these perspectives provides a basis for interpreting their criticism as normatively grounded. Accordingly, we argue that a broader or differently composed sample, potentially including actors more critical of state-led transitions, might have surfaced additional normative disagreements – particularly those challenging the legitimacy of the mission's defining problem. This underscores the need for future research to explore such perspectives more systematically.

Disagreement related to problems is also likely to be more salient in contexts where missions address broadly defined societal challenges (e.g., unsustainability) characterized by even higher levels of uncertainty, complexity, and interpretive flexibility (Rohracher et al., 2023). In early-stage or less mature missions, the framing of the problem and the desirability of specific goals may be more open to debate and contestation. As missions evolve and goals become institutionalized, stakeholder disagreement may increasingly shift toward questions of how to achieve those goals through technological solutions and policy interventions. This suggests a possible temporal progression in the topic of disagreement – beginning with problem framings, moving towards solution pathways, and finally focusing on implementation mechanisms. However, such a progression is neither linear nor guaranteed and can be disrupted by shifts in political agendas, technological developments, or emerging societal concerns.

By conceptualizing, identifying and analyzing varieties of disagreement, this paper contributes to an emerging stream of transitions literature acknowledging that conflicting values are an important part of the policy process (Markard et al., 2021; Holmgren et al., 2022; Lowes et al., 2020; Kuokkanen et al., 2018). While this body of work often uses contestation as an overarching concept, our contribution lies in the conceptualization of the underlying disagreement, including the crucial distinction between factual and normative dimensions. Without this distinction, references to contestation risk overstating the extent of fundamental conflict within missions. In our research case, stakeholders generally agree on the need for industrial decarbonization and share a broad commitment to the mission's goals. Much of the disagreement we observe concerns factual issues – such as technological maturity, infrastructure constraints, or policy design – rather than deeply conflicting values.

At the same time, failing to analytically distinguish normative from factual disagreement risks obscuring what is genuinely contested and downplay the significance of value-based opposition that cannot be resolved through consensus alone. In this sense, our findings contrast recent conceptual work on transformative policy missions (Janssen et al., 2023; Wanzenböck et al., 2020) and broader theorizing on sustainability transitions (Bach et al., 2021; Heiberg et al., 2022; Verbong and Geels, 2010), which emphasize the gradual convergence of opinions through *alignment* (Table 3). Although reflexive learning about the urgency of problems, the feasibility of solutions, and the effectiveness of interventions may reduce both factual and normative disagreement, our observation of normative disagreement regarding the desirability of dominant solutions highlights deeper conflicts that are likely to resist alignment.

In response, we suggest that the concept of *disjointment* holds promise for future research on transformative policy missions (Table 3). Defined as a persistent divergence of opinions rooted in fundamentally conflicting values and beliefs related to visions, priorities, legitimacy claims, and economic interests, disjointment entrenches both factual and normative disagreement. It characterizes situations where stakeholders are not merely misinformed, misaligned, or involved in temporary conflict, but rather hold radically different views on what constitutes an urgent problem, desirable solution, or legitimate policy intervention. Such situations are also resistant to resolution through experimentation, information, dialogue, or coordination – approaches that are often suggested policy responses to contestation (Janssen et al., 2023; Klerx et al., 2025).

While our empirical case is marked primarily by factual disagreement, the presence of difficult-to-resolve normative disagreement illustrates the potential of disjointment to shape transition trajectories, particularly in more contested missions. For example, resistance to certain industrial pathways and the marginalization of broader behavioral and environmental concerns indicate that even seemingly aligned missions may conceal deep normative conflicts. However, we do not claim to have fully established the dynamics of disjointment in this study. Instead, we propose it as a promising heuristic concept that complements existing accounts of alignment and helps explain patterns of inertia, backlash, and fragmentation in mission-oriented innovation.

Disjointment also fills an important conceptual gap in literature on mission-oriented innovation policy, which tends to emphasize alignment and convergence (e.g., Wanzenböck et al., 2020; Janssen et al., 2023). While these processes are vital, they risk understating the persistence of normative disagreement. Recognizing disjointment draws attention to power dynamics, exclusion, and the limitations of consensus-driven approaches, while inviting a broader view of mission governance – one that is attentive to political pluralism, institutional path dependencies, and the potential need for mediation, recognition, redistribution, and compensation.

To support this broader perspective, we identify three interrelated demands on mission-oriented policymaking. First, policymakers must dare to "keep it complex" (Stirling, 2010) and acknowledge that missions can generate a plurality of futures, each with distinct implications for different actors and environments (Andersson et al., 2021; Hojcková et al., 2018). This calls for policies that foster collective sense-making and encourage experimentation – not only with technologies, but also with institutional and governance arrangements. While broad knowledge development is often seen as a way to reduce equivocality and enable stakeholders to take more informed positions (Wanzenböck et al., 2020), this assumption warrants caution. As Zack (2001) points out, equivocality frequently stems from competing interpretive frameworks, not just informational gaps. Similarly, Frishammar et al. (2019) highlight how mission contexts are shaped by strategic ambiguity and bounded rationality, meaning that additional knowledge can sometimes intensify rather than resolve disagreement. Consequently, research plays a critical role in problematizing dominant assumptions, fostering reflexivity, and promoting double-loop learning (Argyris, 1990; Olsson & Jerneck, 2018).

Second, stakeholder engagement is essential not only to foster alignment, but also to surface and confront disjointment. Policymakers can facilitate dialogue but must remain vigilant against the risks of technocratic or elite-driven consensus-building. As the case of Fossil Free Sweden illustrates, alignment efforts often converge around established technological trajectories, marginalizing alternative visions that emphasize behavioral change, sufficiency, or circularity (Brodén Gyberg & Lövbrand, 2022; Marquardt & Nasiritousi, 2022). Effective governance must therefore go beyond aggregating inputs and actively engage with normative trade-offs, ensuring that the perspectives of underrepresented actors are recognized and incorporated into decision-making.

Third, addressing disjointment requires going beyond a focus on alignment, which alone may be insufficient – or even counterproductive. In such situations, introducing new facts can intensify rather than alleviate tensions, especially when actors interpret evidence through conflicting normative or institutional lenses (Zack, 2001; Olsson & Jerneck, 2018). Policymakers must therefore acknowledge that missions inherently create asymmetries, producing winners and losers whose positions may not be reconciled through dialogue alone. Addressing these imbalances requires deliberate mechanisms for mediation, recognition, redistribution, and compensation (Meadowcroft, 2011; Schein, 1993; Carley & Konisky, 2020). Transparent, participatory, and reflexive decision-making processes are vital – not only for managing disjointment, but also for sustaining the democratic legitimacy of mission-oriented policies (Heffron & McCauley, 2018).

Although our study highlights the merits of Q methodology, certain limitations in our empirical research must be acknowledged. Developing a comprehensive q-sample is challenging, as some perspectives may be underrepresented. To mitigate this, we included open-ended interview questions to capture missing viewpoints, though few participants raised issues beyond the q-sample. Additionally, the p-sample does not fully represent all stakeholders, as some individuals – particularly those with more critical perspectives – declined participation. While our findings capture key narratives, they are shaped by the participant group included in the study. These limitations underscore the need for further methodological development to identify excluded actors or framings. For example, future studies could adopt comparative approaches (c.f., Steen et al., 2024) or apply mixed-method designs by combining Q methodology with discourse analysis, participatory workshops, or media content analysis.

Finally, our theoretical contribution paves the way for further research on conflict and contestation in transformative policy missions. Future work should explore the evolution and interdependence of factual and normative disagreement, analyze how their dynamics drive alignment and disjointment, and derive specific implications for the design of mission-oriented policy-mixes. Studying cases in different sectoral and geographical contexts, preferably where normative disagreement is more openly expressed or

**Table 3**
Alignment and disjointment in transformative policy missions.

| | Description | Policy response |
|---|---|---|
| **Alignment** | A gradual convergence of opinions driven by reflexive learning (e.g., about the urgency of problems, feasibility of solutions and effectiveness of interventions), which aligns values and beliefs and thereby reduces factual and normative disagreement. | Experimentation, information, dialogue and coordination. |
| **Disjointment** | A persistent divergence of opinions rooted in fundamentally conflicting values and beliefs (e.g., related to visions, priorities, legitimacy claims and economic interests), which entrenches factual and normative disagreement. | Mediation, recognition, redistribution and compensation. |

institutionally significant, could further test and refine the findings of this paper, ultimately helping policymakers navigate the complex and often contested terrain of transformative change.

## Declaration of generative AI and AI-assisted technologies in the manuscript preparation process

During the preparation of this work, the authors used ChatGPT-5 to assist with language refinement and proofreading. All content generated with the help of this tool was reviewed and edited by the authors, who take full responsibility for the content of the published article.

## CRediT authorship contribution statement

**Johnn Andersson:** Writing – review & editing, Writing – original draft, Visualization, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Hans Hellsmark:** Writing – review & editing, Writing – original draft, Visualization, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Conceptualization. **Elizaveta Johansson:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Conceptualization.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## Appendix

**Table A.1**
The 56 statements in the q-sample (translated to English) with their respective z-scores and rankings for each factor.

| ID | Statement | Factor 1 | | Factor 2 | | Factor 3 | | Factor 4 | |
|---|---|---|---|---|---|---|---|---|---|
| | | Z-score | Ranking | Z-score | Ranking | Z-score | Ranking | Z-score | Ranking |
| S1 | Climate demands on the capital market are too low | 0.86602 | 2 | -0.43389 | -1 | 0.41033 | 1 | 0.70806 | 2 |
| S2 | Financial actors are not willing to make high risk investments | 0.43883 | 1 | -0.28849 | -1 | 0.46383 | 1 | -0.85062 | -2 |
| S3 | Incumbent industry actors focus on energy and materials efficiency rather than system transformation | -0.39096 | -1 | -0.2626 | -1 | -0.54603 | -1 | 1.34112 | 3 |
| S4 | Capital intensive production with long investment cycles creates a lock-in to old technology | 1.19487 | 3 | 0.12601 | 0 | 0.01126 | 0 | 0.9666 | 3 |
| S5 | It is difficult for new actors to enter the process industry | 0.0048 | 0 | -0.03399 | 0 | -0.10065 | -1 | -0.92918 | -3 |
| S6 | Incumbent industry actors have insufficient capabilities to innovative | 0.1721 | 0 | -0.77659 | -2 | -0.57389 | -1 | -0.0392 | 0 |
| S7 | The process industry supplies a global and highly competitive market | -0.06461 | 0 | 0.44398 | 1 | 0.66345 | 2 | 0.44952 | 1 |
| S8 | The climate impact of non-fossil emissions receives too little attention | -1.27065 | -3 | 0.41921 | 1 | 0.0249 | 0 | 0.7774 | 2 |

(*continued on next page*)

**Table A.1** (*continued*)

| ID | Statement | Factor 1 | | Factor 2 | | Factor 3 | | Factor 4 | |
|---|---|---|---|---|---|---|---|---|---|
| | | Z-score | Ranking | Z-score | Ranking | Z-score | Ranking | Z-score | Ranking |
| S9 | Too little effort is made to reduce the need for virgin materials (i.e. reuse and reduced consumption) | 0.81468 | 2 | 0.7238 | 2 | 1.52283 | 4 | 1.85643 | 4 |
| S10 | There is an excessive belief in the potential to reduce climate impacts through increased use of biomass | -1.22155 | -3 | 0.86047 | 2 | -1.09567 | -3 | 0.51886 | 2 |
| S11 | There is an excessive belief in the potential to reduce climate impacts through CCS/CCU technology | -0.09434 | 0 | -0.27923 | -1 | -1.01727 | -2 | 0.18354 | 1 |
| S12 | There is an excessive belief in the potential to reduce climate impacts through electrification | -1.52351 | -4 | -0.06992 | -1 | -1.12882 | -4 | -0.15162 | -1 |
| S13 | The climate transition is oriented towards too few technological alternatives | -0.35477 | -1 | 0.24524 | 1 | -0.86366 | -2 | -1.15564 | -3 |
| S14 | There is an excessive belief in the potential to reduce climate impacts through increased use of hydrogen | -1.50058 | -3 | 1.50489 | 4 | -0.89778 | -2 | -1.08258 | -3 |
| S15 | There is too little experimentation with new solutions | 0.82988 | 2 | -1.07584 | -3 | 0.27962 | 1 | 0.4121 | 1 |
| S16 | It is difficult to recruit the right competence | 1.58825 | 4 | 0.41645 | 1 | 0.21328 | 1 | -0.5208 | -1 |
| S17 | It is difficult to assess emissions reductions from new solutions | -1.14097 | -3 | 0.45455 | 1 | -1.06078 | -3 | -1.3037 | -4 |
| S18 | Knowledge about new business models is lacking | 0.40512 | 1 | -0.36592 | -1 | 0.04698 | 0 | -0.11242 | 0 |
| S19 | Knowledge from research and development projects is not diffused among actors in the climate transitions | -0.19607 | 0 | -1.72157 | -4 | -1.02867 | -2 | -0.18176 | -1 |
| S20 | Swedish universities and research institutes fail to support the process industry with technical knowledge | -0.42293 | -1 | 1.03701 | 3 | -1.09762 | -3 | -0.7437 | -2 |
| S21 | Reaching zero emissions until 2045 is not a realistic goal | -1.65887 | -4 | 0.64515 | 2 | -2.37113 | -5 | -0.81482 | -2 |
| S22 | The goal's focus on national emissions hinders Swedish companies to create global climate benefits | -1.26758 | -3 | 1.31235 | 4 | -1.51293 | -4 | -2.0474 | -5 |
| S23 | The climate transition will harm Swedish exports | -2.08259 | -5 | -1.39028 | -3 | -1.98662 | -5 | -2.15982 | -5 |
| S24 | The climate transition threatens local ecosystems and cultural values | -1.50418 | -4 | -1.00375 | -3 | -1.12572 | -3 | 2.1224 | 5 |
| S25 | The climate transition is in conflict with other environmental goals (e.g. biodiversity) | -0.65689 | -2 | 0.0913 | 0 | 0.58252 | 1 | 2.19546 | 5 |
| S26 | The climate transition leads to materials and fuels with higher prices | -0.4214 | -1 | 0.77523 | 2 | 0.15084 | 0 | 0.77934 | 2 |
| S27 | There is no demand for materials and fuels with low climate impact among the process industry's customers | 0.40456 | 1 | -1.06291 | -3 | -0.41829 | -1 | -1.00952 | -3 |
| S28 | The climate transition leads to more expensive products that are not demanded by consumers | -0.75488 | -2 | -1.47018 | -4 | -1.00089 | -2 | 0.44596 | 1 |
| S29 | Climate change is not taken seriously enough | 0.50059 | 1 | -2.02742 | -5 | 0.69085 | 2 | 0.25676 | 1 |
| S30 | Visions, strategies and plans within the climate transition do not lead to concrete activity | 1.19412 | 3 | -1.93089 | -5 | -0.01066 | -1 | 0.41016 | 1 |
| S31 | Climate investments are driven by the current societal discourse, rather than long-term analyses | 0.24061 | 1 | 0.39651 | 1 | -0.8143 | -1 | 0.81676 | 2 |
| S32 | There is a lack of political direction, overview and coordination | 1.08672 | 2 | -0.96501 | -2 | 1.65994 | 4 | 0.29952 | 1 |
| S33 | Climate demands are too low in public procurement processes | -0.12915 | 0 | -0.82178 | -2 | 0.97753 | 2 | 0.85418 | 2 |
| S34 | There is a lack of a global price on carbon emissions | 1.55439 | 4 | 1.11322 | 3 | 0.32277 | 1 | 0.29968 | 1 |
| S35 | There is a lack of long-term policy instruments at the EU level (i.e. emissions allowances, carbon tolls, investment programs) | 1.11146 | 3 | 0.29052 | 1 | 0.29756 | 1 | 0.1142 | 0 |
| S36 | The environmental permitting process is too slow | 0.18791 | 0 | 2.16934 | 5 | 1.79851 | 5 | -0.55466 | -1 |
| S37 | The environmental permitting process does not account sufficiently for climate goals | 0.33341 | 1 | -0.00145 | 0 | 1.22621 | 3 | -0.22662 | -1 |
| S38 | Government investments and credit guarantees are insufficient | -0.51856 | -2 | -0.94101 | -2 | 0.62518 | 2 | -0.59386 | -1 |
| S39 | Public support to research and development of new technology is insufficient | -0.75766 | -2 | -0.66987 | -1 | 1.06727 | 3 | -0.93096 | -3 |
| S40 | Too little support is given to Swedish firms and stakeholder groups that may be disadvantaged by the climate transition. | -1.85038 | -5 | -0.8771 | -2 | 1.2518 | 3 | -0.7829 | -2 |
| S41 | The climate transition requires large amounts of electricity with competitive pricing | 2.13353 | 5 | 2.1721 | 5 | 2.20359 | 5 | 1.3787 | 4 |
| S42 | There is a lack of circular flows that give the process industry access to recycled raw material | 1.23709 | 3 | 0.21329 | 0 | 1.62088 | 4 | 1.71402 | 4 |

(*continued on next page*)

**Table A.1** (*continued*)

| ID | Statement | Factor 1 | | Factor 2 | | Factor 3 | | Factor 4 | |
|---|---|---|---|---|---|---|---|---|---|
| | | Z-score | Ranking | Z-score | Ranking | Z-score | Ranking | Z-score | Ranking |
| S43 | The possibility of increasing the production of biomass from Swedish forests is contested | 0.72099 | 2 | 0.43511 | 1 | 0.50934 | 1 | 1.0753 | 3 |
| S44 | The expansion of the electricity grid is too slow | 1.82703 | 5 | 1.86083 | 4 | 1.08181 | 3 | 0.0392 | 0 |
| S45 | The supply of important components in new technology is uncertain | -0.47669 | -1 | 0.58115 | 2 | -0.55195 | -1 | -0.67242 | -1 |
| S46 | There is a lack of infrastructure for carbon transport and storage | -0.04887 | 0 | 0.96307 | 3 | 0.12126 | 0 | -1.6353 | -4 |
| S47 | It is difficult to establish partnerships among industrial companies, suppliers and customers | -0.30376 | -1 | -0.68302 | -2 | -1.25012 | -4 | -1.6016 | -4 |
| S48 | There is a lack of collaboration among Swedish and international actors | 0.36094 | 1 | -0.03666 | 0 | -1.04623 | -3 | -0.77934 | -2 |
| S49 | There is a lack of collaboration among public and private actors | 0.34323 | 1 | -0.40533 | -1 | 0.7576 | 2 | 0.00178 | 0 |
| S50 | Important actors, such as customers, suppliers and specialists, are missing in innovation projects | -0.59089 | -2 | -0.98106 | -3 | -0.1081 | -1 | -0.03564 | 0 |
| S51 | Key technologies are immature | -0.96802 | -2 | 0.60713 | 2 | 0.15909 | 0 | -0.52064 | -1 |
| S52 | It is difficult to understand the consequences of new technologies | -0.28553 | -1 | 0.91245 | 3 | -1.01638 | -2 | 0 | 0 |
| S53 | The political debate about the future energy mix hinders increased electricity production in Sweden | 1.11586 | 3 | 0.24063 | 0 | 0.6792 | 2 | -0.73998 | -2 |
| S54 | The climate transition is progressing too slowly in the process industry | 1.33632 | 4 | 0.17794 | 0 | 1.03681 | 3 | 1.26628 | 3 |
| S55 | Geopolitical instability and ongoing war in Europe reduce the outlook for the climate transition | -0.39012 | -1 | 1.24496 | 3 | -0.00681 | 0 | 0.97032 | 3 |
| S56 | There is a lack of visionary leadership | 0.84365 | 2 | -1.85816 | -4 | 0.17392 | 0 | -0.07694 | 0 |

**Table A.2**
P-sample and performed Q interviews with interviewer indicated by author initials.

| ID | Type of actor | Interviewer | Date |
|---|---|---|---|
| P1 | NGO | EJ | 2022-05-23 |
| P2 | Policy | JA | 2022-05-16 |
| P3 | NGO | JA | 2022-04-01 |
| P4 | Industry | EJ | 2022-04-08 |
| P5 | Research | EJ | 2022-03-23 |
| P6 | Policy | JA | 2022-04-11 |
| P7 | Policy | HH | 2022-05-10 |
| P8 | Research | HH | 2022-04-12 |
| P9 | Industry | JA | 2022-05-03 |
| P10 | Industry | EJ | 2022-04-06 |
| P11 | Industry | EJ | 2022-04-07 |
| P12 | Policy | EJ | 2022-04-26 |
| P13 | NGO | EJ | 2022-04-05 |
| P14 | Industry | JA | 2022-03-24 |
| P15 | Industry | EJ | 2022-03-22 |
| P16 | Policy | HH | 2022-06-23 |
| P17 | Industry | JA | 2022-05-16 |
| P18 | Industry | EJ | 2022-04-28 |
| P19 | Industry | EJ | 2022-03-30 |
| P20 | Industry | EJ | 2022-05-10 |
| P21 | Research | JA | 2022-04-11 |
| P22 | Research | HH | 2022-05-04 |
| P23 | Finance | JA | 2022-03-28 |
| P24 | Industry | HH | 2022-05-05 |
| P25 | Industry | HH | 2022-04-12 |

**Table A.3**
Factor loadings of participants' Q sorts. Significant loadings ($p < 0.05$) are highlighted in boldface.

| Participant ID | Factor loadings | | | |
|---|---|---|---|---|
| | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
| P1 | 0.33394 | -0.39375 | 0.01728 | 0.50846 |
| P2 | -0.15191 | 0.02579 | 0.0569 | **0.51261** |
| P3 | 0.2445 | 0.13204 | **0.68668** | 0.14661 |
| P4 | 0.05886 | 0.39212 | 0.3027 | 0.4615 |
| P5 | 0.25021 | 0.27924 | **0.64061** | 0.28884 |
| P6 | **0.45773** | 0.09822 | 0.13919 | 0.38872 |

(*continued on next page*)

**Table A.3** (*continued*)

| Participant ID | Factor loadings | | | |
|---|---|---|---|---|
| | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
| P7 | **0.60626** | 0.15772 | 0.12373 | 0.19444 |
| P8 | -0.03242 | 0.16959 | **-0.38154** | 0.05802 |
| P9 | -0.11576 | **0.42231** | -0.23352 | -0.12445 |
| P10 | 0.03709 | **0.45565** | 0.0303 | -0.04331 |
| P11 | 0.21427 | 0.41114 | -0.00751 | 0.41143 |
| P12 | 0.30169 | 0.10703 | **0.42193** | 0.15607 |
| P13 | 0.27447 | -0.21907 | 0.27595 | **0.56698** |
| P14 | **0.42765** | -0.04089 | 0.10289 | 0.04237 |
| P15 | 0.34495 | 0.04601 | 0.29761 | 0.33835 |
| P16 | 0.27432 | 0.23098 | 0.11005 | **0.44865** |
| P17 | **0.7305** | -0.09522 | 0.24966 | 0.11599 |
| P18 | **0.63759** | 0.09735 | 0.16567 | -0.03272 |
| P19 | **0.5209** | 0.1176 | 0.17132 | 0.19859 |
| P20 | -0.00204 | **0.38389** | 0.12559 | 0.04285 |
| P21 | **0.57231** | -0.09559 | 0.38833 | -0.151 |
| P22 | 0.2741 | -0.20582 | **0.63529** | 0.21193 |
| P23 | 0.18603 | **0.49174** | -0.01269 | 0.25408 |
| P24 | 0.12688 | 0.30206 | **0.41416** | 0.12525 |
| P25 | 0.40236 | 0.15499 | **0.58806** | 0.09247 |

## Data availability

Data will be made available on request.

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