Towards transformative actions through perceptions research: Q-methodology as a tool for identifying ideological dimensions of planning problems

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Abstract
Addressing complex planning problems requires being able to respond to a diverse spectrum of perceptions and ideas. However, capturing nuanced perspectives to develop transformative actions remains difficult in research and planning processes. This paper explores Q-methodology as a tool to analyse ideological dimensions in planning problems. By combining qualitative and quantitative analytical techniques, Q-methodology is a useful tool for studying subjectivity, revealing consensus and divergence among perspectives. Here, I reflect on five diverse applications of Q-methodology—to inform or analyse stormwater and flood risk policy, ease water conflict tensions, and assess co-creation's role in shifting perceptions of transdisciplinarity in climate change adaptation. While acknowledging that there are limitations, these studies illustrate the method's capacity to uncover narratives, foster dialogue, and study transformative processes.

Keywords: Q-methodology, subjectivities research, narratives analysis, communicative planning

1. Introduction

Urban planning presents various "wicked" problems that are complex, multifaceted, and pervasive throughout social systems (Rittel and Webber, 1973). These problems are challenging to manage because they involve several interrelated and co-evolving processes, each with its own counterbalancing forces, making a single best solution impossible. Collaborative planning emerged as a postmodern framework for addressing wicked problems by engaging with diverse viewpoints and fostering inclusive decision-making (Innes and Booher, 2016). Despite planning being largely government-led, postmodern theories advocate for bottom-up approaches that centre inhabitant and user perspectives, recognising that scientific analyses offer only a partial understanding, often overlooking the social, cultural, and ideological forces shaping decisions (Allmendinger, 2002; Innes and Booher, 2010; Irving, 1993). Since its emergence as a dominant postmodern theory, collaborative planning has evolved to address the complexities of power, communication, and governance, challenging modernist assumptions of order and predictability in planning processes (Healey, 2003, 1997). As a result, communicative planning scholarship promotes leveraging communication and collaboration not just as mechanisms for problem-solving, but as essential tools for identifying challenges, negotiating competing interests, and fostering collective capacity to navigate the uncertainties of urban design in dynamic socio-political contexts.

Capturing nuanced viewpoints in planning is a significant challenge due to the inherent complexity of subjective experiences and power dynamics that shape decision-making processes. Similarly, studying wicked problems has multiple modes of entry and requires drawing wieldy boundaries around an inherently complex system (Holling, 2001; Hou et al., 2022). Studying wicked urban planning problems and deciding necessary research priorities is, by definition, reductive even when attempting to cast the widest possible net. Because of the complex nature of wicked problems, mixed-methods approaches offer a means to look at multiple aspects of a problem (Mertens, 2015). One mixed-method technique increasingly used to study wicked problems subjectively is Q-methodology (QM). It uses data reduction techniques to condense multi-dimensional subjectivities into a practical set of perspectives regarding a particular subject. William Stephenson is credited with founding this research method within psychology (Stephenson, 1936, 1935), and it has since been incorporated as a valuable tool in many human research disciplines (Ramlo, 2016a).

In this paper, I reflect on the use of QM as a tool in collaborative urban design. The methodology offers a means to identify multi-dimensional subjective views of various planning problems. This paper is structured as follows. In section 2, I give an overview of QM and how the studies are designed, implemented, and analysed. In section 3, I give a summary of the five QM studies from which this reflection is based. In section 4, I provide insights in the positive aspects of using the QM in planning applications and some of the limitations. Finally, I close the paper with brief concluding remarks.

2. Understanding Q-Methodology

The Q-method (QM) recognises that an individual's subjectivity is better understood in a sociocultural context with respect to the perspective of others. William Stephen developed the methodology out of the idea of an inverted factor analysis (Stephenson, 1953, 1935). Indeed, QM inverts the traditional factor analysis by having m subjects react to n tests rather than performing m tests on n subjects. In other words, QM enables individuals to define themselves through the relative ranking of a set of ideas, and is thus a useful tool for studying subjectivity on a topic of interest (Brown, 1980; Robbins and Krueger, 2000; Stephenson, 1953). The method distinguishes itself from pure quantitative methods as a technique to make discoveries rather than test theories (Stephenson, 1953; Watts and Stenner, 2005). QM is also distinct from purely qualitative methods in that it uses quantitative techniques to articulate these discoveries. Although the method developed in the field of psychology, it has expanded into many different academic and professional fields over the decades (Ramlo, 2016a), for example, human geography (Eden et al., 2005; Robbins and Krueger, 2000), environmental sustainability and conservation (Sneegas et al., 2021; Webler et al., 2009; Zabala et al., 2018), healthcare research and education (Churruca et al., 2021; Hensel et al., 2022)the methodological variations, and the major implications to inform best practices. Design: Scoping review design using the Preferred Reporting Items for Systematic Reviews Extension for Scoping Reviews. Data sources: Academic Search Complete, CINAHL Complete, Education Research Complete, Embase, ERIC, Proquest Nursing and Allied Health, PubMed, PsycInfo, SocINDEX, and the Web of Science Core Collection. Review methods: A comprehensive search of English language journal articles was conducted for Q methodology studies published between 2015 and 2020 that used undergraduate nursing students or nursing faculty as participants. Data were extracted using a modified version of the Assessment Review Instrument for Q Methodology. Results: Eighteen studies from five countries met inclusion criteria. The majority were single-site studies and used nursing students as participants. The number of stimuli for sorting in the Q sample ranged from 21 to 60. Study aims fell into three broad domains: attitudes about patient populations or settings (N = 7, and educational research (Lundberg et al., 2020).

Generally, a QM study proceeds in four major phases: developing a concourse, Q-sampling and Q-set finalisation, collecting Q-sorts and interviewing participants, and data analysis and interpretation. In addition to systematic literature reviews (Dieteren et al., 2023; Sneegas et al., 2021), several primers offer detailed theory and instructions for carrying out a QM study (Brown, 1993; McKeown and Thomas, 2013; Watts and Stenner, 2005). For reference, Table 1 provides a guide to terminology used in QM studies and their meanings.

Table 1. Terminology specific to a QM study.

Term	Meaning
Concourse	A collection of stimuli, usually statements, often numbering in the hundreds, that pertain to a specific topic of interest. The concept of a concourse is that it is the collection of all ideas possible, and therefore can never truly be complete.
Q-sampling	The process of selecting the stimuli that will comprise the Q-set.
Q-set or Q-sample	The final set of stimuli (e.g., statements that are not provable) used for the QM study.
P-set	The set of participants participating in the QM study.
Q-sort	The sorted set of stimuli ranked by each participant according to the pre-defined semi-normal grid.

Phase 1: Building the Concourse. A concourse is created to represent the body of thoughts on the subject of inquiry. While QM studies typically use statements, other stimuli like images, poems, and words can also be used. The concourse, drawn from sources such as interviews, forums, literature or media, provides subjective stimuli for an eventual Q-set selection. Though in theory never exhaustive (Stephenson, 1986), ideas are added to the concourse until the 'point of saturation' when no new ideas are emerging.

Phase 2: Q-Sampling and Q-Set Selection. Once saturated, Q-sampling selects a subset of statements, the Q-set, from the concourse often guided by a structured framework (Brown et al., 2019). To enhance clarity, pilot tests help refine the Q-set, reducing and refining the statements as needed. Statements should be ideas that cannot be readily tested. In environmental sustainability research studies, Sneegas et al. (2021) found the number of statements in the Q-set range from 9 to 69, with a mode of 36. Across other disciplines, the average number may be higher (Dieteren et al., 2023). The appropriate number depends on the ability to capture the breadth of the concourse while considering interview time constraints and participant fatigue.

Phase 3: Participant Selection and Q-Sorts. Study participants are then asked to rank the Q-set based on a pre-defined grid. QM studies focus on identifying the perspectives present among a group rather the central tendencies of a population. Therefore, there are no hard and fast rules on sample sizes, which vary in most studies between 20 and 50 participants (Dieteren et al., 2023). Principally, the number of participants should reflect the amount needed to address the research question at hand (McKeown and Thomas, 2013). Each participant creates a Q-sort—participant-ranked statements based on the pre-defined grid—which are collectively analysed and often complemented by semi-structured interviews for deeper interpretation. While traditionally in-person, use of online Q-sort platforms have expanded in the wake of the COVID-19 pandemic.

Phase 4: Data Analysis and Interpretation. Collected Q-sorts undergo factor analysis. There is an active debate among QM researchers regarding the most appropriate analytical tools and choices at this step (Akhtar-Danesh, 2017, 2016). For instance, QM traditionally used centroid factor analysis and manual rotation, which were largely necessitated by computational constraints in its early development; however, modern studies favour Principal Component Analysis (PCA) and varimax rotation as the prevalent techniques for analysis (Dieteren et al., 2023; Zabala et al., 2018). Nevertheless, since these analytical tools are generally designed for large datasets and QM studies use smaller datasets, careful interpretation is crucial to choosing an analytical path that reflects viewpoints collected. The process reduces the full collection of Q-sorts down to a handful of key perspectives, reconstructed Q-sorts based on the weight of participant correlations to factors. After analysis and interpretation, many researchers suggest this as the starting point of a deeper conversation with the participants, informed by the findings.

3. Example Studies Illustrating the Application of Q-Methodology in Planning

This reflection paper pulls from 5 diverse QM studies employed to different ends related to contemporary planning issues. A summary of the studies is provided in Table 2. Among all studies, a forced grid was used for data collection with ranking statements on a scale from most disagree (-) to most agree (+), and analysed using PCA and varimax rotation to identify the factors. Online interviews were conducted using Q-Tip without a pre-sort step (https://qtip.geography.wisc.edu/) or EQ Web Sort (Banasick, 2023) with a pre-sort step. Data were analysed using Ken-Q Analysis (https://shawnbanasick.github.io/ken-q-analysis/).

Table 2. Summary of various applications of the Q-method

Study: Context and research objective	Study design	Study application	Q-sort design
Study 1 (Honolulu study): Honolulu, Hawaii. A study on stormwater management priorities amid community-government tensions over a US Army Corps flood project	Concourse built from comments taken from media, public forums, and semi-structured interviews. Participants included stakeholders and experts from the community, academia, and government	Online only (Q-Tip) Q-set: 25 P-set: 18 Factors: 4 (3 with one bipolar split into two)	±4: 1 ±3: 2 ±2: 3 ±1: 4 0: 5

Study 2 (Maui study): Lahaina, Maui fire (Hawaii). A study exploring agreement and disagreement on water management strategies after the Lahaina Fire	Concourse built from post-fire press articles. Participants were part of a closed advisory group that guides water management strategies for Hawaii	Online only (Q-Tip) Q-set: 22 P-set: 12 Factors: 3	±4: 1 ±3: 2 ±2: 3 ±1: 3 0: 4
Study 3 (GAM study): Grenoble-Alpes Métropole (GAM), France. A study to understand tensions in flood risk management	Concourse built from semi-structured interviews. Participants were part of a public advisory committee on flood risk management, including managers, experts, and elected officials	Majority in-person (online: EQ Web Sort) Q-set: 32 P-set: 55 Factors: 3	±5: 2 ±4: 2 ±3: 3 ±2: 3 ±1: 4 0: 4
Study 4 (TAA study): Trentino-Alto Adige (TAA), Italy. A comparison study with Study 3 to understand how the EU's principle of subsidiarity plays out in flood risk management	Same study design as Study 3. Participants were flood risk managers or experts. Comparative stats analysed ranking differences among 26 similar GAM and TAA participants	Majority in-person (online: EQ Web Sort) Q-set: 32 P-set: 31 Factors: N/A	Same as study 3
Study 5 (TD-assess study): International. A study to assess the changes in ideas about transdisciplinarity in climate services for climate action	Concourse drawn from semi-structured interviews with international climate service experts. Young professionals from various countries attended a two-week transdisciplinarity school in Arusha, Tanzania, completing a Q-sort before and after the program	Online only (EQ Web Sort) Q-set: 23 P-set: 25 (16 before, 9 after, 7 repeats) Factors: 4 (3 including one bipolar split into two)	±3: 2 ±2: 3 ±1: 4 0: 5

The first application, the Honolulu study conducted in 2020, explored the expectations of stormwater management prompted by a flood risk management project framed in the press as a community-versus-government issue. The QM revealed tensions existed over the role of the government in planning and financing stormwater management, whereas everyone was in agreement to move towards green infrastructure and away from grey solutions. Further details can be found in Arik (2022).

The Maui study was conducted among a non-public stakeholder group in the wake of the Lahaina fire in 2023 which decimated the entire town. Decisions about water releases made during the unfolding disaster prompted a battle that played out over national newspaper outlets—a unusual occurrence for Hawaii-related issues. The conflict stemmed from a decades-long struggle to secure in-stream water rights for indigenous Hawaiian practices, against a deep-rooted legacy of colonial-era water diversion. The purpose of using the QM was to start a conversation between some of the parties at the heart of this conflict—as a means to acknowledge with data the differences of opinion and move quickly to productive conversation.

The GAM study and TAA study are twin studies conducted in 2022 and 2023, in two similar urban settings in France and Italy to understand how flood risk management decisions are made. They both used the same study de-

sign with statements and interviews conducted in French and Italian respectively. Further details about the GAM study can be found in Arik et al. (2023). For the GAM study, an additional judgmental rotation was employed based on one participant who had a leading role in flood risk management. The study was conducted among affiliates of a democratically structured flood risk management steering committee. However, QM revealed that this structure tended to suppress marginal issues—those significantly affecting local communities but not severe enough to become watershed-level priorities. The TAA revealed somewhat of an opposite problem that voices of change were often externalised from flood risk management decision, and that flood risk management decisions remained insular. To compare the GAM and TAA data, comparative statistics were used on the raw Q-sort ranking data. In this case, the PCA was not applied for the comparison.

The TD-assess study explored how participants in a two-week climate services school that took place in 2024 shifted their views on transdisciplinarity in climate action (Vigna et al., forthcoming). To measure this change, they were asked to complete a Q-sort before and after the program. Participants were young professionals from diverse disciplines, working or studying worldwide, but primarily based in Europe or Africa. Unlike the other studies described, which included one-on-one interviews, the TD-assess study gathered perspectives through commentaries in a post-sort survey. The QM revealed a growing recognition of the value of transdisciplinary collaboration.

4. Reflections on the Use of the Q-method in Planning

The QM is a valuable tool for analysing discourse, systematically categorising subjectivities to reveal patterns of agreement and divergence. By bringing clarity to complex planning issues, it helps uncover underlying perspectives that shape decisions and guide deeper discussions. While its effectiveness depends on thoughtful design and interpretation, QM offers a structured approach to fostering more inclusive and informed decision-making in planning. Here, I elaborate on some of its strengths and limitations based on the applications described in the previous section.

4.1. Strengths and Impacts

Understanding the Roots of Conflict. The QM offers a structured approach to analysing discourse, helping to uncover the underlying factors driving disagreements in planning and policy decisions. By identifying viewpoints present among participants, it highlights sources of friction—whether stemming from miscommunication, competing priorities, or deeply held values. This ability to clarify tensions provides a useful lens for understanding how conflicts emerge and where opportunities for dialogue exist. Mapping diverse perspectives can help planners recognise not only points of consensus but also areas of divergence that require negotiation. The Honolulu study illustrates this dynamic, showing that even though stakeholders broadly supported green infrastructure, disagreements about governmental roles in planning and funding fragmented overall alignment. This suggests that consensus on solutions sets alone does not guarantee cooperation—governance structures and expectations around responsibility play a critical role in shaping stakeholder engagement.

The Maui study further demonstrates how structured discourse analysis can facilitate dialogue in deeply rooted conflicts. The Lahaina fire brought long-standing tensions over water rights into national focus, underscoring the historical struggle between indigenous Hawaiian practices and colonial-era water diversion policies. By framing perspectives in a structured way, QM served as a tool to initiate conversations among a critical stakeholder group, offering data-driven recognition of differing viewpoints to move discussions toward more productive outcomes. These studies highlight that understanding stakeholder perspectives is not just about identifying agreement and disagreement, but about recognising the governance, historical context, and discourse structures that shape how conflicts evolve, where QM can help define how they may be navigated.

Amplifying Underrepresented Voices. Dominant narratives in planning often shape decision-making processes in ways that overshadow minority perspectives, limiting the inclusion of diverse viewpoints. Unlike survey instruments that aim to measure consensus or central tendencies, QM provides a structured approach to identifying distinct perspectives among participants, making it particularly useful in highlighting overlooked priorities. The

GAM and TAA studies demonstrate how flood risk management decisions are shaped not only by technical assessments but also by institutional structures. In the GAM study, conducted within a democratically structured steering committee, QM revealed that while decisions reflected majority preferences, they tended to suppress marginal concerns—issues significant at the community level but too localised to influence watershed-scale priorities. Conversely, the TAA study exposed a different issue: voices advocating for change were largely externalised from decision-making, reinforcing an insular approach to flood risk governance. These findings illustrate that participatory structures do not always guarantee inclusivity, emphasising the need for tools that can expose both dominant and marginalised viewpoints.

By systematically categorising viewpoints, QM helps uncover underlying patterns that might otherwise be concealed within governance processes. The comparative analysis between the GAM and TAA studies highlights how flood risk decisions are shaped not just by technical assessments but also by institutional dynamics that determine whose voices are amplified and whose are excluded. In GAM, a structured democratic process inadvertently side-lined concerns that did not meet broader strategic priorities, while in TAA, exclusionary decision-making reinforced internal confidence at the cost of external perspectives. Together, these studies reveal that different governance structures produce distinct challenges in integrating diverse viewpoints into planning processes. QM's ability to illuminate such discursive patterns makes it a useful tool for analysing how decision-making frameworks operate, and how they may be adapted to foster more inclusive engagement.

Facilitating Collaborative Solutions. In complex policy and planning contexts, productive dialogue is often hindered by competing interests, conflicting priorities, and the sheer diversity of perspectives involved. QM helps structure these discussions by reducing the dimensionality of viewpoints, revealing nuanced patterns in stakeholder perceptions rather than treating opinions as isolated and competing. By clustering perspectives, identifying consensus, and highlighting points of divergence, QM enables planners to navigate discourse with greater clarity, offering a structured framework for untangling dense debates and facilitating more effective negotiation. This was evident in the Maui study, where QM findings were used to initiate dialogue, allowing acknowledgement of differences without dwelling on them in a discussion. Similarly, the TD-assess study demonstrated QM's ability to track shifts in participants' perceptions of transdisciplinarity, illustrating how structured discourse analysis can reveal changing attitudes within collaborative settings. These examples highlight QM's potential to bring coherence to complex discussions, ensuring that planning processes account for both areas of alignment and persistent tensions.

4.2. Challenges and Considerations

Dependence on a Well-Designed Q-Set. The effectiveness of QM relies heavily on a carefully constructed Q-set that accurately captures the breadth of perspectives relevant to the study. A poorly designed Q-set can limit the insights derived from the method, restricting the ability to identify meaningful clusters of viewpoints. For example, in the GAM and TAA studies, the statement set attempted to incorporate ideas that were not necessarily central to all participants, leading to many consensus statements around neutral positions that were not very insightful because they reflected a non-positionality. Moreover, since the study was initially designed for GAM and later deployed in TAA, certain statements did not align as well with the TAA context, illustrating the challenges of adapting a Q-set across different governance structures. This underscores the importance of tailoring statement selection to the specific decision-making environment to ensure meaningful insights, which can limit its usefulness to the context. Finding the right balance between participation and the validity of the Q-set can also be tricky. In the case of the TD-assess study, we faced challenges related to participation rates, prompting us to reduce in the number of statements in an effort to increase engagement in the study for future iterations of the program, but preventing us from using the first dataset to compare to future studies. These examples highlight the need for careful Q-set construction, keeping in mind the participants, and ensuring that statements will be effective in capturing the nuances of the participant perspectives while remaining relevant to the study's context.

Complexity in Explanation and Lack of Visualisation Tools. The method itself and its findings can be challenging to communicate effectively due to its complexity and lack of conventional numerical summaries, making

interpretation less intuitive for broader audiences. To date, visualisation tools to communicate QM finding are underdeveloped as well. In the Honolulu and GAM studies, findings were shared openly through reports with opportunity for reactions, with no feedback given. Similarly, a presentation was given to the stakeholder group in the GAM study with no substantive follow-up. This highlights the importance of carefully considering how its results are presented to enhance engagement in planning processes. In contrast, the Maui study demonstrated a more effective approach—using QM as a tool to initiate dialogue among key stakeholders, helping structure conversations around conflicting perspectives because it was conceived as a tool to enhance the discussion. These examples suggest that QM's effectiveness depends not only on its methodological rigor and the ability to communicate the method and findings effectively, but also on its integration in planning processes to foster meaningful discussion.

Context-Specific Nature and Limited Generalisability. The QM is highly context-dependent, meaning its findings often cannot be directly transferred across different studies or planning environments. This is evident in the Honolulu and GAM/TAA studies, which both focus on flood risk management yet show minimal overlap due to their distinct governance structures and local dynamics. While Honolulu study of identifying priorities in stormwater management which revealed underlying tensions, the GAM/TAA studies deployed a Q-set to test potential tensions as hypotheses and revealed governance dynamics. Similarly, the TAA study particularly underscored the importance of designing the Q-set to fit its specific context, as transferring statements from GAM resulted in misalignment of certain statements in the Q-set with local context. Meanwhile, the TD-assess study took a different approach by designing its Q-set with broader applicability in mind—allowing its framework to be potentially redeployed to measure shifts in transdisciplinary collaboration in climate services and adaptation planning. These examples emphasise the need for careful Q-set construction tailored to the study's objectives while considering ahead of time whether the potential for adaptability across similar research domains is a goal or not.

5. Concluding Remarks

Addressing complex planning problems requires approaches that can engage with a diverse spectrum of perceptions and ideas. However, translating subjective viewpoints into actionable strategies remains a fundamental challenge in research and policy-making. Q-methodology can be a valuable tool for analysing ideological dimensions in planning, offering a structured way to assess areas of consensus and divergence. By combining qualitative and quantitative techniques, QM facilitates the study of subjectivity in decision-making contexts, uncovering narratives that influence planning outcomes. This paper examined five distinct applications of QM—from informing stormwater and flood risk policy to navigating water conflicts and assessing co-creation's role in shifting perspectives on transdisciplinarity in climate adaptation. While QM is not a universal solution, its use in these cases demonstrates its ability to highlight discursive patterns, foster dialogue, and provide a structured approach to understanding differing viewpoints.

At the same time, employing QM in planning comes with important considerations. The method's effectiveness relies on a well-designed Q-set and thoughtful implementation, requiring careful framing to ensure meaningful insights. Additionally, its context-specific nature means that findings from one study may not be broadly generalisable, limiting direct application across different cases. Furthermore, QM's complexity can make it challenging to communicate results to diverse audiences, especially given the lack of visualisation tools. Despite these limitations, QM remains a useful mixed-method approach to studying subjective perspectives in planning. When used appropriately, it can offer decision-makers a clearer view of ideological tensions, highlight voices that might otherwise go unheard, and contribute to more informed and inclusive planning processes.

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