Does Quadratic Voting for Survey Research Improve Policy-Making and Decision Outcomes?

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Abstract

This pilot study explores the feasibility of using *Quadratic Voting for Survey Research* (QVSR) as an alternative to the traditional Likert scale in a municipal decision-making context. By observing decision-makers' behavior and voting outcomes, the study provides descriptive evidence on how these two survey methodologies perform in practice. While standard democratic processes often overlook the intensity of citizen preferences, QVSR allows individuals to express preference strength using a limited credit system. In contrast, the Likert scale, though widely used, may be susceptible to response biases and assumptions about sincerity. Previous studies have demonstrated the theoretical and experimental promise of QVSR; this pilot extends that work by assessing its feasibility and practical implementation in a real-world policy environment. Conducted in the Gabba Ward municipality in Brisbane, Australia, the study randomly assigned citizens and policymakers to QVSR or Likert conditions and describes patterns in the alignment between citizen responses and councilor voting. The results are exploratory and intended to inform future, larger-scale evaluations of QVSR's potential to support more nuanced and representative forms of democratic engagement.

1. Introduction

1.1 Motivation

Democratic and survey systems often fail to capture the intensity of citizens' preferences. Standard one-person-one-vote rules give the same weight to those deeply affected by a proposal and those largely indifferent, producing what Lalley and Weyl (2018) describe as *populist tyrannies*—outcomes that reflect numerical majorities rather than welfare-weighted preferences.

The Likert scale, a widely used tool for measuring attitudes, exhibits a similar shortcoming. By asking respondents to choose among discrete options (e.g., from *strongly agree* to *strongly disagree*), it captures the *direction* of opinions but not their *strength*. Responses tend to cluster at the extremes and may reflect social desirability rather than true conviction.

Quadratic Voting (QV) offers a mechanism-design alternative that allows individuals to express preference intensity using a limited budget of credits, where the cost of additional votes rises quadratically (Lalley & Weyl 2018). This pricing rule makes strong expression costly, encouraging participants to weigh their views carefully and reveal which issues matter most. As Mullainathan and Shafir (2013) argue, scarcity focuses attention on what individuals value most,

prompting more deliberate decision-making. In this sense, QV not only measures intensity but also instills reflection.

This pilot examines whether applying QV to survey research—Quadratic Voting for Survey Research (QVSR)—can improve how policymakers understand citizens' priorities and whether it enhances satisfaction with collective decisions. By integrating QVSR into a real-world e-governance context, we explore whether eliciting preference intensity yields decisions more closely aligned with citizens' welfare.

1.2 Related Literature

Law and economics has long grappled with the challenge of aggregating individual preferences into collective choices that are both fair and welfare-enhancing. Classic public-choice theory emphasizes that while majority rule is procedurally egalitarian, it fails to account for differences in preference intensity (Mueller 2003; Farber & Frickey 1991). Institutional legitimacy, in this view, depends not only on process but also on whether outcomes maximize social welfare (Posner 1998; Cooter & Ulen 2016).

Within this framework, Quadratic Voting was proposed as a mechanism-design solution to the problem of preference aggregation (Lalley & Weyl 2018). By pricing additional votes quadratically, QV allows individuals to express intensity while limiting domination by any single actor. Laboratory and simulation studies find that QV produces more efficient and welfare-maximizing outcomes than simple majority voting (Goeree & Zhang 2017; Casella & Sanchez 2019).

Empirical work supports these theoretical claims. Field studies show that QV-based mechanisms can lead to more minority victories and better reflection of societal welfare (Quarfoot et al. 2017). In attitudinal research, QV-inspired survey formats outperform Likert scales in distinguishing issues respondents care about most and in reducing noise from extreme-response behavior (Cavaillé, Chen & Van der Straeten 2019, 2025).

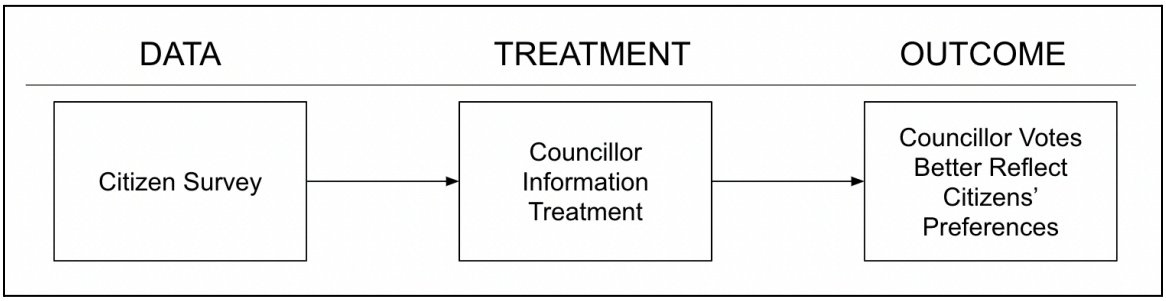
Our pilot seeks to build on this literature by moving from experimental and hypothetical contexts to practical e-governance. Using a QVSR platform in the Gabba Ward municipality in Brisbane (Bassetti et al. 2023), we explore the feasibility of incorporating preference intensity into survey-based policymaking and describe whether doing so appears to be associated with closer alignment between citizen priorities and councilor decisions, which may, in turn, relate to perceptions of political legitimacy.

2. Research Strategy

2.1 Theory of Change

The causal theory we are investigating is that reports of citizen surveys that represent those citizens' preferences more accurately will cause politicians to vote in accordance with citizens' preferences. The diagram below illustrates the theory of change we propose, where the

correlation between councilors' votes and citizens' preferences is dependent on the random assignment to information delivered using Likert scales or QV as the independent variable.



Note that there are many potential pitfalls that could invalidate the narrative proposed by the infographic 1. It is possible, for instance, that the councillors are skeptical of survey results. In that case, even though we have provided them with better information about citizens' preferences, the representatives do not trust that information enough to let it persuade their decision-making. It is also possible that councillors' votes are tied to the decision of their party's leadership. If that's the case, then it is plausible that a new independent survey report would not have a significant impact on votes.

2.2 Sampling

This study involves policy makers and citizens from the Gabba Ward municipality in Brisbane and collects data in three waves. We use two samples for this study:

1. In order to recruit citizens for the experiment, we integrated our existing Civicbase web application into the Online Community Voting Portal, which had 1456 registered users and ~500 active users. Through this, we expected to engage a sample size of more than 500 citizens to produce citizen preference data as it pertains to relevant issues for councilors voting.
2. There are 27 councilors, which includes the Lord Mayor and Councilor Jonathan Sri (study sponsor). We expect to observe 26 councilors' behavior in voting for survey items at committee meetings that are open to public observation. Each councilor voted on 10 items.

2.2 Assignment to Treatment

The citizen participants were randomly assigned to the treatment group (QVSR) or the control group (Likert). The treatment group took a QVSR survey, and the control group took a Likert survey. A summary of data was collected from each group and council members of standing committees were randomly assigned to receive one of them.

3. Data Collection

3.1 Variables

Councilor Level Variables	- Name - Gender - Age - Years in Parliament - Political Party - Past votes on issues - Committees
Treatment Variables	- Policy questions voted on - Vote (for/against/abstain) - Treatment received (QVSR/Likert) - Treatment intensity (maybe?)

Councilor Survey	- Satisfaction variables:
	  - Would you use QVSR again? (yes/no/abstain)?
	  - Are you satisfied with the overall outcome? (yes/no/abstain)?
	  - Do you think the survey data helped you make a decision? (ye/no/abstain)?

Citizen Survey Variables	- Date of Submission - Suburb - Treatment received (QVSR/Likert) - Survey questions - Votes (number of credits allocated or strongly disagree/disagree/neutral/agree/strongly agree) - Email (identifier) - Order of questions (because order randomly changes)

We hypothesized that councilors who receive QVSR data will be more likely to vote in accordance with the overall preference than councilors who receive Likert data, since it shows preference intensity.

3.2 Assignment to Treatment and Balance Checks

Randomization was implemented at the suburb level. Each suburb was randomly assigned to one of the two survey technologies—Quadratic Voting for Survey Research (QVSR) or the Likert scale. All citizens within a given suburb received the same version of the survey. The aggregated results from each suburb's assigned survey type were then summarized and transmitted to the corresponding councilor.

This design ensured that differences in responses or satisfaction could be attributed to the survey methodology rather than local contextual factors. To verify that randomization achieved balance, we compared observable characteristics (such as gender and political affiliation) between treatment and control groups. None of these differences were statistically significant ($p > 0.10$), confirming that randomization produced comparable groups prior to treatment. Full balance statistics are presented in Table 1.

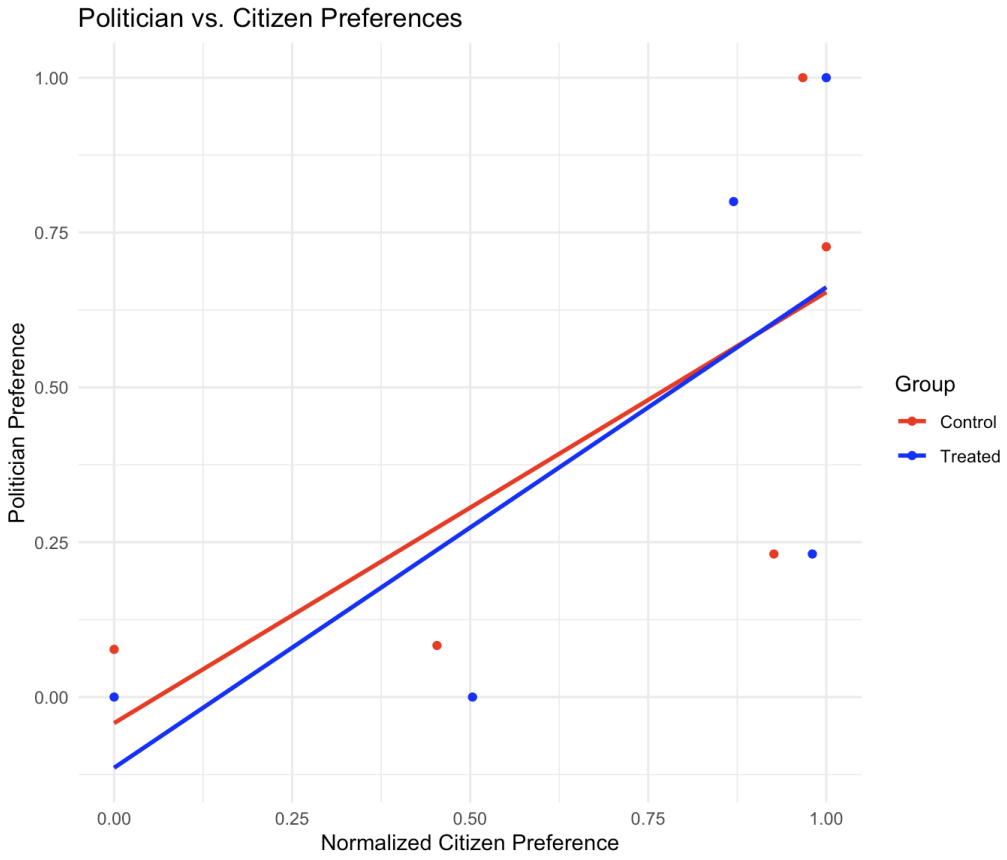
Table 1

	(1)
	QVSR Treatment
female	-0.103
	(0.218)
liberal	-0.0690
	(0.276)
N	25
adj. R-sq	-0.073

4 Results

After collecting the data on the votes of councilors for each of the policies and the citizen survey data, we plot the results in the scatterplot below. We show the alignment between citizen preferences and councilor votes, by information condition. Each dot is a policy-topic × unit observation. The x-axis is the citizen-preference score for that topic (0–1). The y-axis is the councilors' voting outcome/preference on that topic (0–1). Points are colored by the information

treatment delivered to councilors (QVSR vs. Likert). Lines show OLS fits within each arm. The slopes are ~0.71 (Likert) and ~0.74 (QVSR) (each with 10% statistical significance) and no meaningful intercept shift nor meaningful slope shift. Thus, councilor votes do track citizen preferences overall (positive slope), but there is no detectable difference in responsiveness between QVSR and Likert in this figure.



While our findings provide encouraging evidence that Quadratic Voting for Survey Research (QVSR) can be deployed to aggregate preferences without adverse impact on the quality of decision outcomes, several caveats warrant discussion. First, the study was conducted with specific policy questions; generalizing to additional real-world policy-making contexts requires caution. Second, institutional adoption may depend on administrative capacity, legal feasibility, and cultural attitudes toward novel voting mechanisms. Third, the study is limited by sample size in certain treatment arms, which constrains the power to detect statistically significant impacts. Future research should extend this work in three directions: (1) field experiments with additional policy stakeholders and higher stakes, to test whether QVSR shifts actual policy outcomes; (2) mechanism experiments that disentangle the channels through which QVSR has effects; and (3) longitudinal designs that explore persistence of effects, learning curves, and possible unintended consequences. These avenues can help clarify the scope and robustness of QVSR as a practical legal-economic innovation in collective choice.

5. Conclusion

This pilot study offers a descriptive assessment of the feasibility and potential of *Quadratic Voting for Survey Research* (QVSR) as an alternative to the traditional Likert scale in municipal decision-making. Conducted as a small-scale randomized implementation in the Gabba Ward municipality in Brisbane, Australia, it examines whether QVSR can be practically deployed to capture preference intensity in survey-based policymaking.

Our findings indicate that councilor votes generally tracked citizen preferences across both survey formats, with patterns suggesting that QVSR may capture variation in preference strength without reducing interpretability. The implications of this pilot extend beyond the specific context of Brisbane. They point to the feasibility of integrating preference intensity into e-governance and suggest directions for future large-scale studies assessing whether such approaches can enhance representativeness, satisfaction, and legitimacy in democratic decision-making. Overall, this work contributes to the growing literature on innovative voting and survey mechanisms by providing initial, descriptive evidence that QVSR can be implemented in real-world governance contexts.

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Appendix:

1. Sample presentation of Likert survey data to be sent to councilors:

<Worldbank header>

We asked several citizens of Brisbane to choose one of the five options ranging from **"strongly agree" to "strongly disagree"** for **10 policy issues** relevant to them. **Each citizen could choose one option per question.** The following is what they expressed:

<sample question>

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
5	20	50	100	75

1 person = 1 vote

Or

Question	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
<question 1>	5	20	50	100	75
<question 2>	150	5	40	30	25
…	…	…	…	…	…

1 person = 1 vote

2. Sample presentation of QVSR survey data to be sent to councilors:

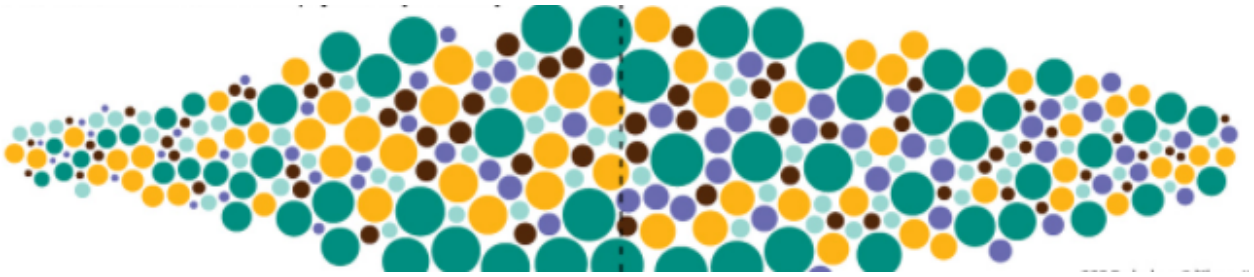
We asked several citizens of Brisbane to agree, disagree or abstain for each for **10 policy issues** relevant to them.

Citizens were allowed to have **more than one vote per question** but were **given an upper limit on the total number of votes they could cast** across the 10 issues.

This allowed them to allocate **more votes on issues that were more important to them** at the cost of allocating less votes on issues that were less important to them.

The following is what they expressed:

<sample question>



One bubble stands for one person, bubble size for preference intensity and colour for preference (agree/disagree))

Email to Councillors

Dear Councillor Landers,

As part of an ongoing research project to improve policy making and decision outcomes for The City of Brisbane, the **World Bank** is seeking to better understand the views of Brisbane City Councillors on local issues. As such, we would greatly appreciate a few minutes of your time to complete a short survey. All results will remain **strictly anonymous**.

This survey uses a novel methodology called 'Quadratic Voting'. You will be given 100 credits to buy votes for or against a set of survey questions. This video provides a brief demonstration.

Take Survey

We would appreciate it if you could complete the survey **by Friday 15 April**. There will be a follow-up survey later this month. On behalf of the research team, thank you for your participation.

If you have any queries, please feel free to contact me on 0420 330 970 or at avicary@worldbank.org.

Regards,
Ashley