Value-Centered Framing Supports Inclusive Idea Convergence in Participatory Civic Design

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Abstract

Collective decision-making in civic design contexts is often structured around surface-level consensus, such as idea popularity, which can obscure the diverse values that underlie community preferences. In this paper, we investigate how foregrounding shared values impacts the convergence phase of a community design process. We conducted a within-subjects experiment (n=24) using a design probe that simulates a civic decision-making task for a local recreational park. Participants engaged in three conditions, counterbalanced for order, that varied the extent to which personal values were identified before voting. Through surveys and interviews, we found that value conditions significantly increased participants' sense of inclusion, alignment with community values, and willingness to compromise, without increasing perceived effort. Participants reported that value-centered framing helped them interpret others' priorities, reflect on their own, and feel more connected to the broader community. These findings contribute to the design of civic technologies by demonstrating how lightweight value-centered scaffolding can support deeper deliberation, shared understanding, and more equitable public input.

CCS Concepts

• **Human-centered computing → Interaction design process and methods**; **Empirical studies in HCI**; **Collaborative and social computing theory, concepts and paradigms**.

Keywords

Participatory Design, Civic Technology, Value-Centered Framework

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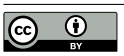

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1 Introduction

Co-designing shared spaces, such as recreational parks, with a community offers unique opportunities to harness and reflect collective opinions and ideas [15]. However, the process can be challenging due to the diverse and often conflicting priorities of stakeholders [18, 34, 49]. Navigating competing priorities can be particularly difficult during the convergence phase of civic design, where community members must decide on which ideas to implement and which ideas to forgo. Traditional decision-making approaches, such as majority voting or pairwise comparison, tend to prioritize the most popular ideas rather than fostering comprehensive, inclusive solutions [59]. Majority voting suffers from the rich-get-richer phenomenon [24], where community members are more likely to focus on existing popular ideas and neglect attention to other valid ideas [44]. Pairwise comparison, where community members evaluate options side by side, can reduce bias and surface novel ideas in the decision-making process [51]. This approach becomes more challenging when proposals involve nuanced trade-offs or layered dimensions. As the complexity of ideas increases, the number of comparisons required can grow rapidly, making the process difficult to scale [4, 8, 30]. Given that community spaces are intended to serve diverse populations, traditional decision-making approaches can leave certain community members feeling dissatisfied, unheard, or disengaged from the design process [36]. When decisions prioritize majority rule or surface-level preferences, they may risk overlooking deeper values and shared priorities, potentially weakening community buy-in and long-term engagement [31].

In response to these challenges, we explore the potential of a **value-driven convergence approach** in collective decision-making. Prior literature suggests that value-focused thinking – surfacing underlying core values or interests – is an effective strategy for identifying better alternatives and decision opportunities [28, 37, 38]. By foregrounding values rather than immediate, concrete preferences, this approach aims to encourage deeper inclusion and deliberation in the collective decision-making process. Similar design frameworks, such as moral framing [63] or nudging reflectors [66], have helped users understand conflicting stances, as well as improved understanding of their own choices by surfacing

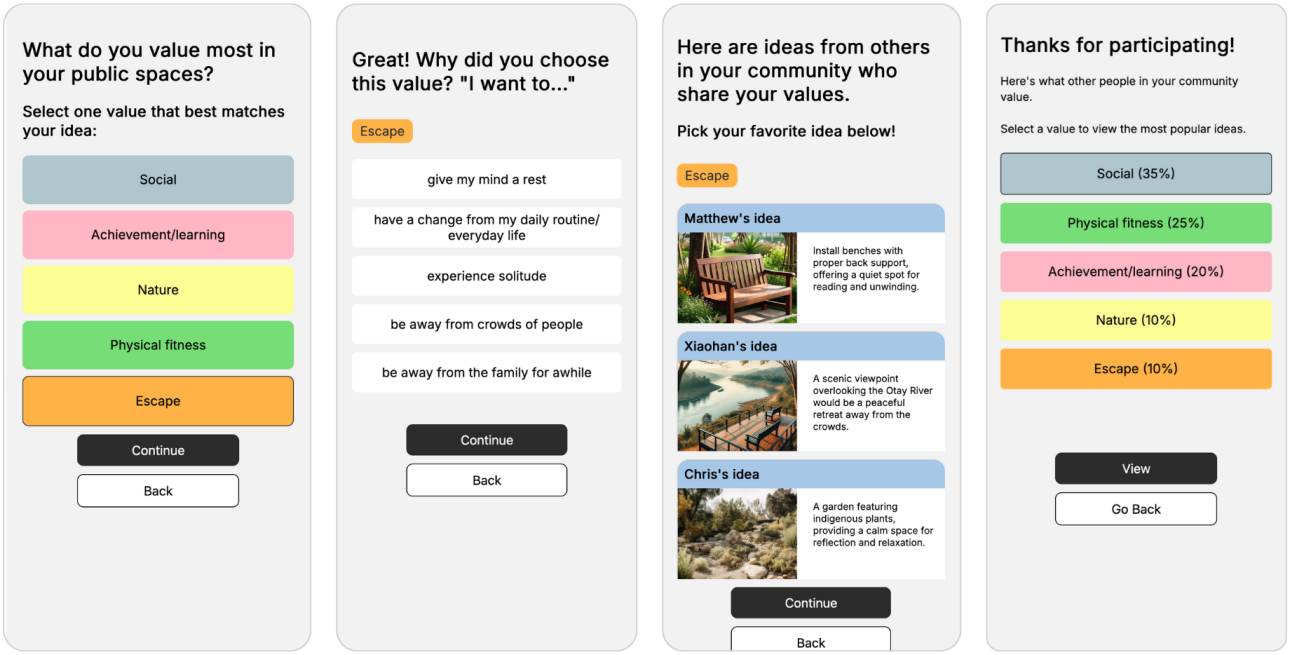

Figure 1: Interactive prototype for Condition 2 (Value), where users identify with a value, vote on recreational park ideas based on their value, and view community votes categorized by shared values rather than default popularity

the underlying, implicit considerations. Thus, we investigate the following research question:

RQ: How does a value-driven convergence approach affect community members' sense of belonging, community alignment, shared understanding, and willingness to compromise during the participatory design process?

We investigate this question in the context of the community-driven design of a local recreational area, where ideas from the community have already been collected through an ongoing project. We first derived a set of values appropriate for a recreational park from the Recreation Experience Preferences framework [14, 47]. Then, we designed three interactive probes, consisting of two variations of the value-driven convergence approach (Idea+Value and Value) and a majority voting baseline approach without values (OnlyVoting). In all three probes, community members were asked to vote on their favorite community ideas and see the voting results. Idea+Value and Value had an additional step before voting, where they were asked to select a set of personal values on a recreational area. In Idea+Value, we further prompted the user to provide an open-ended idea for the recreational area before selecting the values. We included Idea+Value as a variation of the value-driven convergence approach to examine how contributing a personal idea might influence community members' experiences; it also gives insight into designing an optimal workflow that helps to surface the underlying values behind ideas.

To evaluate the effectiveness of the value-centered framing, we conducted a within-subjects study with three conditions involving 24 participants from the surrounding community. Participants engaged in all three conditions after being assigned to one of the counterbalanced orders. Then, participants filled out a survey consisting of Likert-scale questions and open-ended questions following each voting approach and then in a brief final interview, answered questions about which condition they liked most, felt most involved in, and best understood community opinions through.

Our findings suggest that foregrounding personal values before voting fosters a significantly stronger perceived sense of inclusion, alignment with community perspectives, richer community understanding, and willingness to compromise without significantly increasing perceived mental effort. Participants in Idea+Value showcased a more confident voting compared to OnlyVoting. The highlighting of values created an easier voting process and provided context for participants to understand and dive deeper into community preferences. While there were no significant differences between Idea+Value and Value in the self-reported survey other than participants' willingness to compromise, providing one's own ideas before choosing a value helped participants reflect on their values more deeply and see connections between their own and the community's needs. This work contributes to civic technology and participatory design by illustrating how lightweight value framing can support more reflective, belonging, and community-oriented decision-making.

2 Related Work

Our approach is informed by previous work on theoretical frameworks for incorporating values in decision-making processes, analyses of participatory urban design, and prior digital platforms that facilitate collective decisions.

2.1 Incorporating Values in Decision Processes

2.1.1 Theoretical Value Frameworks. Our work builds on theoretical approaches such as "Value-Focused Thinking" [37], "Design for Values" [61] and "Value-Sensitive Design" [28], applied specifically to the field of urban design. These frameworks indicate that stakeholders' values should be the driving force behind design decision-making processes, as this will support the process of convergence and improve the quality of the final result by ensuring that the outcome matches the fundamental needs and desires of the community. Our research aims to quantify the impact of centering values on user experience during a convergence stage.

2.1.2 Values in Practice. Values have been strategically incorporated to improve decision-making processes by forming a more thorough understanding of the problem and solution space in a wide range of fields, including business [38], mobile technology [56], environmental sustainability [48], and health policy [62]. Identifying and agreeing on collective values and focusing the conversation around those values can support the efficacy of group decision-making [12]. Prior work in collaborative design suggests that integrating negotiation techniques that surface participants' underlying interests, and using them to inform criteria to evaluate alternatives, can improve consensus-building in collaborative design [40].

Values, personality traits, and behaviors all inform what community members want in their urban spaces, particularly public recreation spaces. Past work has focused on understanding the relationship between users' personality traits and their corresponding recreational behaviors to inform planning decisions [21–23]. We seek to surface individual characteristics in a solution-oriented way to help foster alignment across the community as they engage with the urban planning process.

2.2 Participatory Urban Design

Historically, governmental urban planning decisions have been made behind closed doors, inaccessible to the general public. Recent decades have seen increased recognition of the need for new urban decision-making models, and therefore, new diverse strategies have emerged to reform the traditional top-down model of urban design and architecture by increasing citizen participation.

2.2.1 Understanding Citizen Participation. Citizen participation is not a binary. Arnstein's Ladder of Citizen Participation conceptualizes public involvement in governance as an eight-level hierarchical model, ranging from nonparticipation to full control [6]. Citizen participation in the urban development process can fall anywhere on that model, and has been shown to have a positive impact on outcomes. Reynante et al's open civic design framework also explores civic participation through the intersection between public participation, crowdsourcing, and design thinking [52]. Public participation in planning makes the process more effective and adaptable while strengthening the overall social system [57]. One concrete strategy of public participation to transform procedures and outcomes is co-design, which has been defined as an iterative process motivated by inclusive principles that employ practical tools to empower users and manage ideas [10, 19]. Despite the clear potential benefits of citizen participation, in practice it faces obstacles as governmental bodies struggle to establish adequate processes, among other difficulties [35]. Innovative approaches that help support citizen participation are needed to address these challenges. Our approach aims to facilitate effective and meaningful citizen participation by making it easier and more rewarding for the public to contribute to the co-design process.

2.2.2 Multi-Criteria Decision Making. One of the challenges inherent in urban design and planning is the necessity of managing the diverse needs of the population that the space is meant to serve while adhering to the space, budget, and time constraints. The complexity of determining the best solution in such contexts is formalized in decision-making literature as Multi Criteria Decision Making (MCDM) [7]. These many factors can be managed by integrating stakeholder participation and alternative performance evaluation into a multi-criteria framework, supporting a more holistic analysis and better-informed decisions [5]. Finding ways to visualize and engage with these multidimensional demands is a key challenge that should be addressed by systems aiming to facilitate the group convergence process in complex domains such as planning. Community values are one of many important criteria that must be balanced when making urban design decisions, and our work explores how surfacing a community's values can help individuals better understand the nuances of the solution space.

2.3 Digital Platforms for Collective Decisions

2.3.1 Engaging Diverse Opinions. Digital tools enable negotiation and collaboration strategies that are impractical or impossible in a traditional conversational setting. These potential performance and consensus-building benefits to online collaboration have been studied previously [9, 54, 67]. Visualizing sources of disagreement across multiple criteria helped groups of decision makers align their opinions [42]. Using a moral-value based framework when engaging with different political opinions helped users understand others' positions and re-frame their own arguments [63]. Our design builds on this work by prompting participants to interpret their opinions using a set of values, investigating whether this value-focused intervention has a positive effect on their experience of involvement and engagement with their community.

2.3.2 Digital Place-Based Citizenship. The integration of digital technology into practices of citizenship and urban development can support residents in shaping the future of their cities, though care must be taken that these systems do not perpetuate existing inequities [58]. While digital media platforms come with their own set of challenges, they also provide a unique opportunity to increase access to bureaucratic decision-making processes and bolster citizen participation [29, 46, 64]. Recognizing these capabilities, communities have leveraged web-based technologies such as Facebook or Second Life to support new strategies of participation in the planning process [1, 26]. Interactive web forums have been used to facilitate self-organized community discussions about the

environmental siting process required for a local public park [2]. Citizen engagement has been supported through mobile phone apps that provide opportunity for citizen impact, public dialogue, and more, illustrating the novel emergent benefit of mobile participation [17, 25, 33].

However, most municipal planning departments provide only basic information through "monologue communication" on their web pages, perhaps due to the technical and financial constraints associated with the development of advanced interactivity and support for digital discourse [27]. Here exists the opportunity for significant improvement, helping to meet the demand from citizens for increased interaction with their government.

Purpose-built online participatory tools (OPTs) can help planners meet this demand and improve participatory planning by facilitating consensus building and the incorporation of local knowledge [3]. A review of ten existing digital platforms for public participation in urban design highlighted how the systems supported flexible contributions, facilitated a two-way flow of communication between decision-makers and citizens, and motivated civic engagement by making the process more playful [60]. From the citizens' perspective, e-participation tools are particularly effective when they feel they are influencing the result and being treated equally [20]. An analysis of one Swedish OPT, CityPlanner™, which citizens can use to comment on urban planning topics using a map-based interface, found that it generated more suggestions from a more diverse group of people than conventional methods [32]. Another system, CommunityCrit, supports various levels of contribution to an urban design project by offering users 'micro-activities' related to the ideation process [45]. Other approaches use Public Participation Geographic Information Systems (PPGIS) to integrate geospatial data into the participation experience [11, 13, 50].

While each of these projects provides opportunities for users to contribute to unique elements of the urban design process, we focus on the relevance of underlying values as users consider community-generated design proposals. Our work complements existing ideas by developing an online tool that explicitly surfaces shared community values to encourage deeper engagement and consensus in urban design. Our design probe for participatory civic engagement aims to improve the quality and utility of opinions expressed about conceptual urban design proposals.

3 Approach: Value-Centered Convergence

A common approach to eliciting community preferences in participatory civic design is to vote between a pairwise or a list of possible ideas [53, 65], often considered an effective convergence method due to its accessible and lightweight nature [65]. Our approach utilizes the task of voting in convergence, but adds an extra step of foregrounding thinking about values before choices and alternatives [38] by asking them to select values they resonate with the most before voting for ideas. In the voting stage, they are given a set of ideas that fall into the chosen value category they selected rather than a random set of ideas.

3.1 Value Framework

We explored and defined a value framework, creating a comprehensive set of attributes that are directly applicable to the design of the community park.

The Schwartz theory of basic values [55] identifies ten universal personal values across cultures, which are hypothesized to influence individual behavior in various ways. However, for our use case, we found these values to be too abstract (e.g., 'Universalism', 'Power') and thus inaccessible to the lay user.

After an investigation of an appropriate value framework suitable for community park design, we landed on the Recreation Experience Preference (REP) [47] scales. REP scale is a psychological approach to analyzing the recreation experience, understanding recreational activities as "behavioral pursuits that are instrumental to attaining certain psychological and physical goals". The original REP scale consists of 12 domains (e.g., 'learning-discovery', 'physical fitness') and scale items (sub-categories; e.g., 'to learn about a new area', 'to improve my physical health') under each domain.

As REP was developed to consider all forms of recreation, we selected a subset of such domains and scale items that best reflected the domain of our focus. To select the most appropriate domains and scale items, the authors tagged existing community ideas generated in an ongoing civic project for a recreational area in San Diego, USA [1] using the most relevant domains and scales from the REP scales. First, we automatically tagged the ideas using ChatGPT for reference and then manually filtered and revised the domains and scale items within the research team. The final value framework contained 5 domains and 21 scale items (available in Appendix A.2), where the ideas were evenly distributed across the 5 value domains.

4 Study of Value-Centered Convergence on Ideas for a Local Park

4.1 Method

We conducted a within-subjects study with 24 participants to examine how a value-driven convergence process influences community decision-making. Each participant took part in a simulated community park design task, where they evaluated and voted on potential park feature ideas (e.g., disc golf courses, peaceful walking trails, fire pits for social gatherings) through an interactive prototype.

Conditions. The study included three conditions, each differing in the extent to which personal values were explicitly self-identified before voting, namely **Idea+Value**, **Value**, and **OnlyVoting** (Detailed phases in Fig. 2). We created two variations of the value-centered condition to explore the influence of prompting participants to contribute an idea on their subsequent voting experience and engagement with others' ideas. The conditions were counterbalanced, and each participant completed all three conditions in one of the orders they were randomly assigned to.

In Idea+Value, participants were asked to share their idea for a new park near the university as an open-ended text response. Then, they were asked to choose which of the five values is most important to them in public spaces (see Section 3.1 for an explanation of the values). Next, they were asked to pick a more concrete sub-value (scale item) for choosing that value. Finally, they voted for

[1] https://engage.sandiegocounty.gov/ovrpar3

Phase (Page) / Condition	Idea Sharing	Value Selection		Voting	Browsing
		Value Selection	Sub-value (Scale Item) Selection		
OnlyVoting				Vote on others' ideas from random subset	View most popular ideas overall
Value		Pick best-match personal value	Pick best-match sub-value	Vote on others' ideas within value	View most popular ideas within value
Idea+Value	Open-ended text entry on their park idea	Pick best-match personal value	Pick best-match sub-value	Vote on others' ideas within value	View most popular ideas within value

Figure 2: Description of the phases for each condition.

their favorite of three ideas categorized under that value and then browsed the most popular ideas by value. Value was identical to Idea+Value but without the initial idea-sharing step. OnlyVoting did not involve values, and participants voted on their favorite of three randomly selected ideas regardless of the value with which they were associated, then viewed the most popular ideas overall.

Participants and Procedure. A total of 24 participants (12 women, 10 men, 1 non-binary, 1 prefer not to say) from the surrounding community were recruited through announcements in student group chats and social media messaging platforms. Four participants indicated that they had experience in urban design, city planning, or community projects. After each condition, participants completed a survey (details in Appendix A.1) consisting of Likert scale questions on Mental Effort, Confidence, Inclusion, Alignment, Community Understanding, and Willingness to Compromise and short-answer responses. At the end of the study, we conducted a brief structured interview to further explore participants' decision-making processes, perceptions of community inclusion, and engagement.

Implementation. The interactive prototype, as seen in Figure 1, was developed using HTML, CSS, and JavaScript, with a predefined set of ideas from an ongoing civic project for a recreational area in [anonymized for review]. The prototype was static – ideas, selected values, and votes submitted by study participants were not reflected.

Analysis. For the Likert-scale survey questions, we ran the Friedman test to assess overall differences, followed by pairwise Wilcoxon Signed-Rank tests with Bonferroni correction for multiple comparisons [16]. We also ran the Friedman test followed by repeated-measures ANOVA to check for an order effect, but there were no significant results, thus omitted from the results. For the open-ended survey and interview questions, we conducted deductive coding based on categories informed by our main research questions.

4.2 Results

With the survey results, we observed that Idea+Value and Value provided significant benefits compared to OnlyVoting in all four dimensions (inclusion, alignment, community understanding, willingness to compromise), while we did not observe an increase in mental effort required. Participants in Idea+Value reported more confidence in their voting. The open-ended responses showed a similar trend to the survey and allowed us to further explore how surfacing values during the process guided voting with structure and clarity and served as lenses to understand community preferences, potentially making participants more open to compromise.

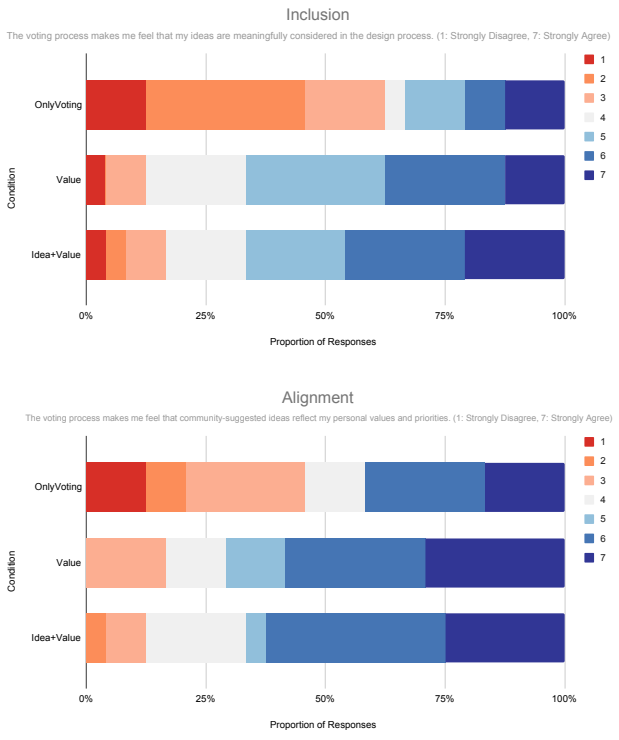

Figure 3: Breakdown of Likert-scale survey responses for inclusion and alignment.

4.2.1 ***Inclusion: Stronger sense of community belonging in value conditions.*** There were significant differences between participants' sense of inclusion ($\chi^2(2) = 16.58$, $p = 0.00025$; Fig. 3

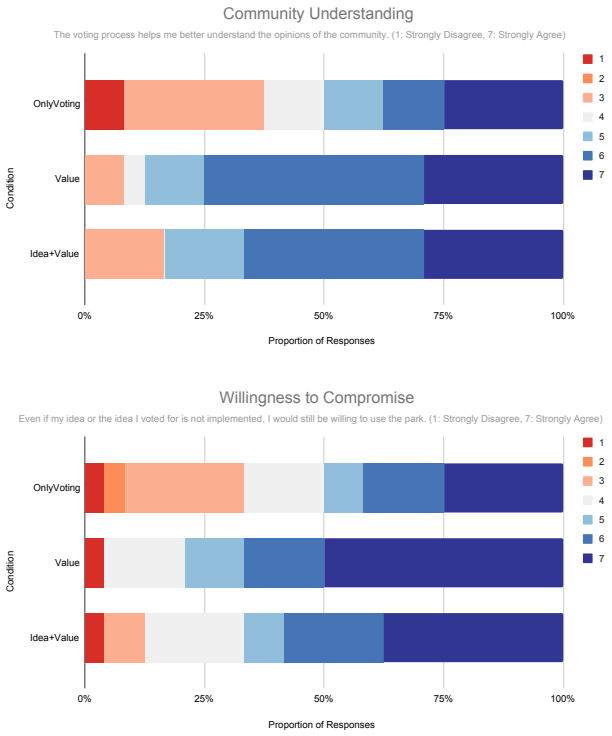

Figure 4: Breakdown of Likert-scale survey responses for community understanding and willingness to compromise.

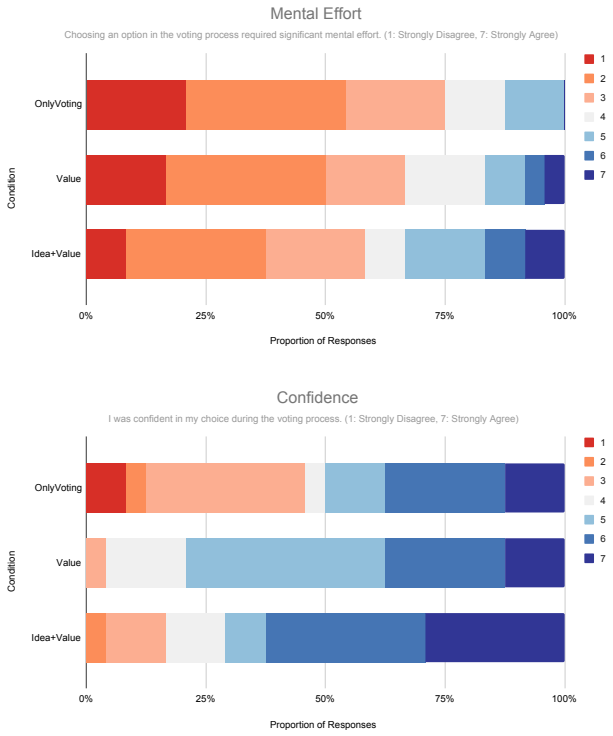

Figure 5: Breakdown of Likert-scale survey responses for mental effort and confidence.

Top). Participants reported that they perceived a greater sense of inclusion in Idea+Value (M = 5.04, SD = 1.65; $W = 22.0$, $p = 0.009$) and Value (M = 4.96, SD = 1.43; $W = 8.0$, $p = 0.001$) than in OnlyVoting (M = 3.46, SD = 2.02).

Although participants in general reported a stronger sense of belonging or inclusion in the Idea+Value and Value survey, these factors appeared infrequently in responses to open-ended questions. However, when asked if Idea+Value enhanced their understanding of the community's values, participants brought up elements of feeling included in the convergence process, particularly regarding their sense of voice and choice. P1 stated that Idea+Value made her "*feel like [she] had a voice, which is probably how other community members would feel.*" Another participant, P2, in similar words, noted that they "*felt like they had a choice*" within their community, which in their view, facilitated meaningful decision-making. These responses suggest that while belonging may not be explicitly articulated, procedural elements like voice and choice may serve as pathways through which participants experience community connection and inclusion.

4.2.2 ***Alignment: Stronger sense of alignment in value conditions through providing clarity and structure.*** For alignment with community opinions, we also observed significant differences ($\chi^2(2) = 11.19$, $p = 0.0037$; Fig. 3 Bottom). Participants perceived a greater alignment with community values in Value (M = 5.42, SD = 1.47; $W = 29.0$, $p = 0.022$) than in OnlyVoting (M = 4.21, SD = 2.08), and marginally greater alignment in Idea+Value (M = 5.38, SD = 1.50; $W = 36.0$, $p = 0.09$) compared to OnlyVoting. There were no significant differences between Idea+Value and Value.

When participants were asked which condition improved community alignment and decision-making, two themes came up frequently in their written responses; many participants spoke positively about improved clarity during the decision-making process (P3, P4, P6-9, P12, P14, P16-18, P22) and faster decision-making and alignment (P2, P4, P7, P8, P14). Participants also often used words like 'narrow down' to describe how the value-driven conditions helped provide structure in their decision-making process (P2-4, P12, P15, P18). Additionally, participants like P14 observed that selecting a value prior to decision-making not only helped him focus on specific ideas better but also improved his "*understanding of why I chose my idea,*" a comment that was echoed by P21, who also noted that "*Value helped me think more about why I had an idea and not only what I like.*" P3, while acknowledging how Value improved their decision-making, talked about how they still struggled with misalignment: *"Yes, I think Value helped me make a better decision! It sucks finding out other people's values don't align with mine though."* These responses overall suggest that the value-driven approaches of Idea+Value and Value facilitated more deliberative and self-aware decision-making by encouraging participants to

consider the underlying rationale behind their preferences, instead of relying primarily on "knee-jerk" choices.

However, there were some participants who felt constrained by having to contribute an idea before voting by value in Idea+Value (P9, P15). P15 specifically noted that "*writing down my idea before basically felt like a 'trap' where I had to vote for something that I wrote down beforehand.*" While early idea contribution could enhance participants' sense of voice, it may simultaneously reduce their openness to community alignment during the convergence phase.

4.2.3 ***Community understanding: Better grasp of community opinions in value conditions.***

For community understanding ($\chi^2(2) = 7.11$, $p = 0.0285$; Fig. 4 Top), participants reported better understanding of community opinions in Idea+Value (M = 5.63, SD = 1.38; $W = 35.5$, $p = 0.028$) and Value (M = 5.83, SD = 1.17; $W = 12.0$, $p = 0.01$) compared to OnlyVoting (M = 4.58, SD = 1.93).

Participants were generally positive in response to questions about whether they felt that Idea+Value and Value improved their understanding of their community. P4 observed that Value *"helped me understand that public places can serve different purposes, and that's important when planning a park!"* Multiple participants (P20, P21, P22) used words like 'care' when responding to the question, stating that Idea+Value and Value helped them identify *"what [their] community cares about in the context of the experiences and activities of a park"* (P22). Similarly, P7 and P8 talked about how Idea+Value and Value supported them in learning about the unexpected "priorities" and "expectations" of their community, which in turn helped them understand their community better. P12 demonstrated this shift towards deeper analytical thinking, noting based on the results that *"Everyone wants to be social I guess, which aligns with the idea of 'community' values. Because if the entire community wants to enjoy solitude, the benches may not be enough."* These responses suggest that the value-centered framing served not only as a decision-making tool but also as a lens for discovering and interpreting the motivations that underlaid community preferences.

Some participants criticized, or did not find Idea+Value and Value helpful in their decision-making. P10 explained that they "didn't really care to think about what other people voted on, just mine." This mode of thinking was acknowledged by P12, who expressed that "most people tend to vote for what their own interests are." P12 also described feeling a little "pigeon-holed" into their singular value. Although value-centered framing may improve understanding among community members, it may not be enough to overcome individual-focused orientations, indicating that supplementary approaches may be necessary for some participants.

However, when compared to participants responses to OnlyVoting, where they were also asked if OnlyVoting improved understanding of their community, participants expressed frustration and dissatisfaction. Some described feeling that only popular ideas were represented and that the direct decision-making mechanism felt limited (P7, P10, P11, P20, P21), or even *"stunted...and not representative of the entire community"* (P2). P22 remarked, *"This is just normal voting, so it feels more like the United States election. Which sucked in the same way, since I can't tell why people voted for stuff like pickleball courts."* P22's comment reveals key limitations of traditional, popularity-based voting systems and why they can be frustrating: they obscure the underlying motivations and values that drive community preferences, leaving participants unable to understand or empathize with differing choices. This contrasts with the value-centered conditions, where participants could see not just what the community preferred, but also why they preferred it, which may enable deeper reflection or open up community conversation.

4.2.4 ***Willingness to compromise: More flexibility in compromising in value conditions, especially in Value.***

For willingness to compromise ($\chi^2(2) = 14.91$, $p = 0.0006$; Fig. 4 Bottom), participants reported that they are more willing to compromise their ideas in Idea+Value (M = 5.42, SD = 1.69; $W = 6.0$, $p = 0.026$) and Value (M = 5.83, SD = 1.55; $W = 3.0$, $p = 0.003$) compared to OnlyVoting (M = 4.71, SD = 1.85). In addition, participants were more willing to compromise in Value compared to Idea+Value ($W = 4.0$, $p = 0.021$).

Many participants in OnlyVoting felt that they were forced to compromise, expressing frustrations around the limited options provided (P7, P10, P15, P16, P17) and the lack of personal voice (P6, P13) in the decision-making process. P2 echoed this by saying "Rather than thinking about what I'd want to see in a community park, it felt like a compromise to the entire community's desires and, therefore, like my voice wasn't heard.", consequently influencing their perception of this process to being "less serious as [they weren't] as personally invested."

In contrast, participants in Value and Idea+Value described more thoughtful engagement with others' perspectives. P9 in Value reflected that "seeing the proportion of the community made me think about how realistic the community-selected idea I voted for actually was. [...] made me consider the ways the community would need to compromise". Similarly, P22 in Idea+Value shared, "Since I understand people slightly better. I can see compromise as an option for some ideas." These comments may suggest that being exposed to others community members' thoughts, not just ideas but also values or preferences, encouraging more positive reflection on the tradeoffs and potentially leading participants to be more open to compromise.

4.2.5 ***Mental effort and confidence: No significant difference in mental effort, more confident voting in Idea+Value than OnlyVoting.***

There were no significant differences in their mental effort between the three conditions ($\chi^2(2) = 4.63, p = 0.099$). On the other hand, for self-reported confidence in their voting, there were significant differences ($\chi^2(2) = 7.9$, $p = 0.019$), where participants were more confident in their voting in Idea+Value (M = 5.42, SD = 1.56) compared to OnlyVoting (M = 4.33, SD = 1.88; $W = 48.5$, $p = 0.056$) (illustrated in Fig. 5).

Multiple participant described OnlyVoting as being "straightfoward" (P14) or "direct" (P11), with P14 adding that he didn't have to think much. However, similar comments were also made regarding Idea+Value and Value: P7, in response to a question about whether he felt Idea+Value led to improved decision-making, observed that *"Idea+Value was definitely faster. I did not look at all the ideas because I already knew that some did not align with the vision I had originally."* This could be related to the idea contribution feature, where participants were able to commit to their own ideas before examining what their community wanted, therefore speeding up deliberation time.

5 Discussion

Our evaluation of a value-driven convergence approach via a design probe explored how structuring civic decision-making around shared values, rather than preference alone, affects community members' sense of inclusion, alignment with community, shared understanding, and willingness to compromise. In this section, we discuss the role of ideas and values in value-centered community engagement, potential varying modes of participation, and alternative implementations of the value-driven approach, concluding with limitations and future work.

5.1 How Did Ideas Influence the Experience of Value-centered Community Participation?

When we asked participants which condition they liked the most, 17 participants selected Idea+Value, followed by 4 in Value, 2 in OnlyVoting, and 1 with multiple preferences, indicating a mutual preference towards Idea+Value. Sharing their own ideas for the park before selecting a value and voting helped participants think more deeply about their personal opinions, allowing them to articulate their preferences in a park beyond single-word values. Moreover, some participants expressed that formulating their ideas beforehand helped them solidify their values and feel more confident during the voting process by "[giving them] clarity on the aspect of community [they] value the most" (P23). Others found it enjoyable to propose ideas for a new community area.

While Idea+Value was the most preferred, it also introduced tradeoffs in terms of long-term engagement and flexibility. There are chances that the ideas might discourage iterative participation or sustained involvement, especially if early contributions have little influence on the final outcomes. Participants in Value reported the highest willingness to compromise. This may come from some participants perceiving the process of Idea+Value as restrictive, feeling that they had to commit to their initial idea even if their perspective evolved later on. For some participants, articulating an idea early in the process made it harder to detach from that perspective later on, even when community needs suggested a different direction.

5.2 Values as Scaffolding for Convergence and Compromise

Across both value-driven conditions (Value and Idea+Value), we found that engaging community members in reflection on their values before voting led to members perceiving the civic design process to be significantly more inclusive and aligned with overall community values. These findings echo calls in prior work to move beyond binary voting and simple community feedback mechanisms and more towards platforms that emphasize community reflection and engagement [39, 45]. Given that convergence can often be a long and complex process, our value-driven approach not only reduced the cognitive effort of deliberation but allowed participants to make better sense of otherwise opaque community preferences. Voting by values allowed participants to see how individual ideas related to shared needs, such as social gathering spaces or natural environments, which reframed decisions from isolated opinions to expressions of collective priorities. Subsequently, community members were significantly more willing to compromise and had a deeper understanding of their community compared to OnlyVoting. This supports the notion that intentional value framing and self-reflection matters; it can meaningfully reshape how people interpret conflicting priorities, see themselves in relation to others, and improve the quality of deliberation [39, 63, 66].

5.3 Supporting Different Modes of Participation

We explored two designs of the value-driven approach and evaluated their effects on the study. While most participants preferred Idea+Value, the survey results did not show significant advantages of one condition over another. This result may stem from community members' differing preferences regarding how they express their opinions in a participatory design process. Some participants appreciated the opportunity to freely share their ideas before selecting a value, noting that it made the value selection process easier. In contrast, others preferred a more structured and straightforward voting process. Since a significant portion of our participants were college students, it might be that age or other factors impacted the preference for active participation. This finding aligns with the work of Maas et al. [43], who clustered citizens based on their participation identities and levels of commitment (e.g., motivated activists, the very busy), suggesting that civic design often elicits diverse participation from a heterogeneous population. Similarly, a value-driven approach should be flexible enough to accommodate different modes of participation and give community members the option to choose the level of engagement they are willing to contribute.

5.4 Alternative Implementations of the Value-Driven Approach

In our implementation of the value-driven approach, we employed a step-by-step process to scaffold participants' values before reaching the voting process. While this method aimed to connect values to ideas with minimal friction, there are alternative approaches to surfacing values beyond merely associating them with ideas.

One potential alternative is to allow participants to select multiple values rather than restricting them to a single value. This approach would better capture the multidimensional nature of community preferences and reflect the complex priorities that each individual holds [28]. Some participants perceived the values as still too broad and had difficulty connecting the ideas presented during the voting stage to their own priorities. For instance, P24 commented that they wanted to see ideas that fell under both 'Social' and 'Physical Fitness' simultaneously.

Another alternative is to present values not just as words or phrases but as reasons that support specific ideas. This approach would link values more directly to practical outcomes, helping participants gain a richer understanding of the underlying motivations, in line with Leong and Robertson's participatory workshop designs [41]. By doing so, participants can develop a more in-depth and nuanced understanding of community priorities and preferences.

5.5 Limitations and Future Work

Our participants were recruited primarily from the university community, which may not adequately represent the diverse composition of the broader public or other community groups that may

have different perspectives and priorities. Future studies should recruit a more diverse sample by including participants from various age groups, socioeconomic backgrounds, and geographic locations to better capture a wide range of community perspectives.

Additionally, our prototype utilized data from a prior community engagement project, where votes from participants were not reflected in the final output. Some participants noted a discrepancy between the ideas shown and the area being described for the park. Future research could employ real ideas that specifically describe the targeted region and collect and show true community preferences. This approach could enable an analysis of final community responses and voting outcomes from the perspective of civic leaders and decision-makers.

6 Conclusion

In our study, we designed and evaluated a value-driven digital process for community convergence in participatory community park design. This work explores how centering personal values within civic decision-making processes can foster more reflective, inclusive, and community-oriented participation. Through a within-subjects study using an interactive prototype, we examined how different framings – Idea+Value, Value, and OnlyVoting – influenced participants' sense of inclusion, perceived alignment with their community, and their willingness to compromise. Our findings demonstrate that lightweight value framing before decision-making, even when simulated, helps individuals better situate their own ideas and both interpret and empathize with those of others. Our approach contributes to ongoing efforts in participatory design and civic technology to create more inclusive community engagement practices. Future work can explore how value-driven decision-making frameworks might scale in real-world policy and design processes and support long-term community engagement across diverse stakeholders.

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A Study Materials

A.1 Survey Questions

The survey consisted of the below questions.

Likert scale questions (1: Strongly Disagree, 7: Strongly Agree)

- (Mental Effort) Choosing an option in the voting process required significant mental effort.
- (Confidence) I was confident in my choice during the voting process.
- (Inclusion) The voting process makes me feel that my ideas are meaningfully considered in the design process.
- (Alignment) The voting process makes me feel that community-suggested ideas reflect my personal values and priorities.
- (Community Understanding) The voting process helps me better understand the opinions of the community.
- (Willingness to Compromise) Even if my idea or the idea I voted for is not implemented, I would still be willing to use the park.

Open-ended questions

- (Only in Idea+Value) How did expressing your idea before choosing a value influence selecting the value and/or the voting process?
- (Only in Value) How did choosing your values affect how easy or difficult it was to vote on a final idea? Why or why not?
- How did this decision-making process help (or not help) you understand the community's values?
- Do you think this value voting method led to better decision-making? Why or why not?

A.2 Value Set Developed using the Recreation Experience Preferences Scale

Domain	Scale Item/Statement
Achievement/ learning	- gain a sense of self-confidence - develop your skills and abilities - test your abilities/learn what you are capable of - experience new and different things - do something creative such as sketch, paint, take photographs
Escape	- give your mind a rest - have a change from your daily routine/everyday life - experience solitude - be away from crowds of people - be away from the family for a while
Social	- do something with your family - bring your family closer together - be with friends or members of your group - be with people having similar values - meet other people in the area
Physical fitness	- get exercise - keep physically fit - relax/rest physically
Nature	- view the scenery - be close to nature - learn more about nature

Table 1: Final set of values developed from the Recreational Experience Preferences scale [47]. Domain indicates value, and Scale Item/Statement indicates sub-value.