



HOKKAIDO UNIVERSITY

Title	Procedural Fairness and Expected Outcome Evaluations in the Public Acceptance of Sustainability Policymaking : A Case Study of Multiple Stepwise Participatory Programs to Develop an Environmental Master Plan for Sapporo, Japan
Author(s)	Ohnuma, Susumu; Yokoyama, Miki; Mizutori, Shogo
Citation	Sustainability, 14(6), 3403 https://doi.org/10.3390/su14063403
Issue Date	2022-03-14
Doc URL	https://hdl.handle.net/2115/85101
Rights(URL)	https://creativecommons.org/licenses/by/4.0/
Type	journal article
File Information	sustainability-14-03403-v2.pdf



Article

Procedural Fairness and Expected Outcome Evaluations in the Public Acceptance of Sustainability Policymaking: A Case Study of Multiple Stepwise Participatory Programs to Develop an Environmental Master Plan for Sapporo, Japan

Susumu Ohnuma ^{*}, Miki Yokoyama [†] and Shogo Mizutori

Department of Behavioral Science, Hokkaido University, North 10 West 7 Kita-ku, Sapporo 0600810, Japan; myokoyama@lynx.let.hokudai.ac.jp (M.Y.); mizutori405@eis.hokudai.ac.jp (S.M.)

* Correspondence: ohnuma@let.hokudai.ac.jp; Tel.: +81-11-706-4158

† Japan Society for the Promotion of Science Fellow.

Abstract: Measures of sustainability-related participatory programs vary according to social and cultural contexts. Thus, this study proposed a stepwise participatory program in which stakeholders and randomly chosen citizens (citizen panels) were repeatedly and sequentially involved, and the citizen panels discharged discrete functions through all the planning stages. Procedural and outcome fairness was focal to the evaluation of the participatory program because these criteria are widely deemed essential for public acceptance. Evaluation by nonparticipants was imperative because of the limited number of participants, but sustainability plans affect and mandate the cooperation of the general public. Therefore, this study undertaken during the revision of the city of Sapporo's environmental master plan compared evaluations of nonparticipants with those of participants from three stages of the stepwise participatory program applying backcasting scenario workshops. A two-wave mailout survey was administered to test two hypotheses: (a) workshop participants would evaluate the acceptance, process, outcome, and antecedent factors more positively than nonparticipants, and (b) procedural fairness and evaluation of expected outcomes would affect acceptance. The results supported these hypotheses. Procedural fairness was associated with acceptance most robustly and consistently. The study's primary contribution to the extant literature entails accumulating empirical evidence on stepwise participatory programs.

Keywords: citizen participation; multiple stepwise participatory programs; procedural fairness; sustainability policymaking; public acceptance



Citation: Ohnuma, S.; Yokoyama, M.; Mizutori, S. Procedural Fairness and Expected Outcome Evaluations in the Public Acceptance of Sustainability Policymaking: A Case Study of Multiple Stepwise Participatory Programs to Develop an Environmental Master Plan for Sapporo, Japan. *Sustainability* **2022**, *14*, 3403. <https://doi.org/10.3390/su14063403>

Academic Editors: Ricardo García Mira and Graciela Tonello

Received: 11 February 2022

Accepted: 10 March 2022

Published: 14 March 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Public participation is crucial for the successful implementation of a sustainable policy because it requires citizen consent [1]. When considering citizen participation, the local context must be considered, particularly for making the policy feasible, efficient, and tangible by involving various people [2]. The acceptability of a policy is significant for making sustainability goals feasible, which would lead to cooperation from the broader public [3–6].

Numerous case studies performed on processes to design measures pertaining to renewable energy [7–9], natural resources including shale gas [10,11], and sustainable city planning [12] have reported that citizen participation forms the grounding for public acceptance. However, the methodologies of participatory programs vary depending on social and cultural contexts and require both conceptual cognition and an increasing accrual of case-based information [2].

The current paper proposes a participatory package encompassing a stepwise role-sharing design founded on deliberative democracy from the domain of political sciences

and fairness studies in social psychology. It is specifically tailored to the Japanese context and mandates the engagement of stakeholders and randomly selected citizens in the planning process. The randomly selected citizens discharge discrete roles during the decision stages.

The factors that promote public acceptance should be investigated. This study focuses on procedural fairness and distributive fairness [13,14], which, as proven by numerous studies, has an effect on public acceptance, whereas various antecedent factors can be observed depending on the social and cultural contexts [15]. The current paper examines the effects of a stepwise participatory program on public acceptance and demonstrates the significance of procedural and distributive fairness with the case of an environmental master plan for Sapporo, Japan.

1.1. Designing Hybrid Stepwise Participatory Programs

Questions about who are citizens and who should participate in planning endeavors have been long debated [16,17]. Decisions may be skewed if only stakeholders or highly interested people participate in planning processes. The opinions of the majority are understated, although mere majority rule is not always the dominant decision imperative. Deliberative democracy has developed the concept of mini-publics to tackle such questions, in which randomly chosen citizens participate in the planning processes [18–20]. The premise of mini-publics assumes that randomly selected individuals should be representative of the public at large and that the decision should be reasoned if they deliberate in an appropriate manner. It will lead to political trust and legitimacy if these assumptions are fulfilled [21]. The idea of mini-publics has been widely adopted in many nations, including Japan. Such collectives are sometimes called citizen jury [22], planning cells [23], deliberative polling [24,25], and consensus conference [26]. However, mini-publics are insufficient on their own to undertake the entire consensus process of planning because the concerns and values of stakeholders should also be considered. Therefore, a hybrid participatory program labeled “cooperative discourse” was proposed for a decision-making process that engages experts, stakeholders or people with a vested interest, and a citizen panel representing the entire region [27].

Although cooperative discourse has provided useful insight and good practices, a failed instance of such hybrid participation was reported because the stakeholders did not approve the decision proposed by the randomly chosen citizens [28]. Such failed experiences offer the lesson that stakeholders need to consent to the decision procedure in advance and should be accorded the opportunity to join the dialogue after the citizen panel comes to a decision. However, the process should also ensure that stakeholders respect the assessments and counsels of the citizen panel. Therefore, participatory programs should be carefully designed with regard to the when and how of involving stakeholders and citizen panels in the stepwise planning process [29].

The functions of the citizen panel in the decision process should be elucidated and differentiated in designing participatory programs. The present study classifies the functions along the decision process in terms of procedural fairness, of which the antecedents and components are helpful for the evaluation of participatory programs [11,30–32]. It is widely recognized that citizens should be accorded with opportunities to express their opinions and that diverse opinions should be reflected in the policy plan [30,33]. The opportunity to express opinions and the reflection of the opinions are lumped together as “reflection of voices”, which is one of the most widely applied criteria in procedural fairness adjudications [34–36]. The inclusion of the voice entails the necessity of the involvement of citizens in the early stage of the planning; otherwise, it is difficult to reflect their opinions. Repeated opportunity is also a requisite of the criterion of correctability, a prime element of procedural fairness [37]. Moreover, it is crucial for proposed plans to be assessed before they are finalized. The citizen panel performs the function of value consultation: members of the citizen panel assess the proposed plan in terms of both outcome and process [23,38]. Notably, the roles discharged by participants during the planning process should be distin-

guished. In particular, the participants of citizen panel taking a role of value consultation should be differentiated from the participants attending the occasion making voice during preceding stages. To be feasible and acceptable to the broader public, the validity of the proposed plan should be assessed by third parties not engaged in the preceding stages. Nevertheless, although plural opportunities in the planning process have been recorded in some programs, existing citizen participation instances have not always explicitly delineated the functions of the citizen panel during the planning process [39]. This study proposes a stepwise participatory program that encompasses both stakeholders and citizen panels, clearly differentiating the functions of the citizen panels according to the stages of the planning process. The roles discharged by the participants in the proposed program vary from the early to later stages. Diverse values of the proposed plan are discovered and reflected upon in the initial stages and are subjected to consultative discussions in the later stages.

Backcast scenario workshops are widely adopted for participatory programs for planning sustainability goals. Such situational programs invite participants to imagine an ideal future and conceive the conditions required to achieve it [40–43]. In contrast, forecasting begins with the current position, determines the current difficulties, and seeks solutions for them. While forecasting is suited to immediate and short-term problem-solving, it is not apt for long-term visioning. Policies geared toward sustainability should consider the demands of future generations; hence, backcasting is more suited for seeking and setting goals to be achieved [39]. However, backcasting is not an omnipotent methodology. The established goals may be too ideal, and it may be difficult to evaluate their feasibility. Furthermore, the goal-sharing measures may sometimes be neglected. The goals described in the proposed plan become meaningful when the broader public, not only participants, share the goals because broader public cooperation is required to achieve sustainability-related objectives. Participants joining the planning process are quite few in the population, while the vast majority is nonparticipants. Those who do not participate in the planning process are sometimes unaware of the goals to be shared, making the effected policies less likely to succeed. Therefore, the appraisals of citizens who have not participated in the preceding stages should be involved in the planning process. The stepwise participatory program presented in the current paper proposes that a citizen panel entered the process at the last stage should act as a representative value consultant, appraising the feasibility of the proposed plan and the potential of being shared the goals to the public at large. Finally, the current study investigates the public evaluation of the entire planning process through the participatory program and focuses on the tenets of procedural and distributive fairness to explore the factors associated with the acceptance of the proposed plan.

1.2. Procedural and Distributive Fairness as an Evaluative Yardstick for Participatory Programs

Previous research endeavors have recommended that participatory programs should be evaluated for their efficiency in planning better development methods [29,31]. In particular, it has been suggested that people who did not participate in such programs should evaluate the planning process because of the critical importance of both participants and nonparticipants accepting the plan [31]. If such processes are not implemented, a given plan is unlikely to be effective because environmental sustainability strategies require widespread public cooperation. This study explores the effects of public participation programs that emphasize procedural fairness and demonstrates that a fair process of stepwise decision-making based on citizen participation fosters greater public acceptance of new sustainability plans.

This study focuses on procedural and distributive fairness to investigate factors relevant to public acceptance because fairness is closely related to public participation. A vast volume of social psychology literature reveals that public acceptance and policy support are inseparable from issues pertaining to procedural and distributive justice [37,44–46]. Distributive fairness concerns outcomes and consequences [35,37] emanating from the allocation of resources, rewards and costs, and benefits and harms [47,48]. Distributive

fairness is prioritized in public decision-making as it focuses on the criteria required to ensure a positive outcome for an entire society [47]. For example, it is widely recognized that for a sustainability plan to be successful, it should aim to benefit all parties to be affected, including future generations. On the other hand, procedural fairness concerns the processes of allocating resources and decision-making with respect to the design of plans [35]. This aspect encompasses the procedural components of the social system, including both prelegal decision-making and legal progressions [35,37]. Specific measures must also be employed to assure a fair process of public decision-making. It has been argued that both distributive and procedural fairness are essential for the acceptability of environmental policies [5]. Procedural arrangements are inseparably connected to the acceptance of policymaking decisions [49]. Significantly, fair decision-making processes are emphasized when it is challenging to achieve public acceptance [50].

1.3. Antecedent Factors of Procedural and Distributive Fairness in the Context of the Participatory Program for Policy Planning

Procedural and distributive fairness are comprehensive concepts; therefore, many antecedent factors have been identified [37,44,45]. The relevant antecedent factors of procedural and distributive fairness must be selected on a case-by-case basis [15], cognizing the specifics of instances.

In ascertaining the antecedent factors to be measured in participatory programs for sustainability planning, openness, the reflection of myriad voices, and representativeness were identified as the three relevant antecedent factors of procedural fairness. The rationale for the selection of these three constituents is outlined as follows. First, openness assures transparency, including information disclosure, and provides everyone the opportunity to participate. It is thus a general principle of the evaluation of any process [30,31,33]. Second, the reflection of voice is a critical criterion of the assessment of participatory program practices [30,31,33]. If a program is not reflective of voices, the significance of a participatory program is lost, regardless of the number of citizens accorded the opportunity to express their opinions. Moreover, the opinions voiced should be reflectively inclusive: they should incorporate the views of both the majority and the minorities to be affected. If people perceive that an inclusive range of participant opinions is not indicated in the plan, the program is likely to be regarded as just a means of enabling some citizens to vent their views while the procedure itself remains unfair. Finally, representativeness denotes whether the participants exemplify all citizens. It is thus also an essential factor for the evaluation of a participatory program [30,31,33,37]. If people perceive that the program only epitomizes those who are extremely interested in the issue, the program will be deemed biased and illegitimate, and by extension, the process will be adjudged as unfair.

Public benefit, the effectiveness of sharing common goals, and feasibility were identified as the relevant antecedent factors of the evaluation of expected outcomes for sustainability-related participatory programs. Public benefit refers to the desirability of the program for all of society, which is a crucial factor as the plan is intended to promote desirable sustainable goals that would benefit all residents. However, the mere description of a goal is not enough to actually achieve the objective. A set goal will remain ineffective unless it is translated into an objective shared by many people and thus becomes a common understanding. This step is crucial because the very formation of the awareness of common goals suggests that society is moving toward the goal. Therefore, it is necessary to endeavor to promote the desired goals widely across all sections of society. This outcome is described as the effectiveness of sharing common goals. If people perceive that it is effective to share the common goals for the achievement of the targeted objectives, their expectations for the plan's outcome will be positive. Finally, feasibility is also crucial for outcome evaluation: if people perceive the plan to be unattainable and unrealistic, they will not expect the plan to produce a good outcome regardless of their perception of the ultimate goal as acclaimed.

1.4. Research Question: What Aspects of the Evaluations Change?

In contemplating public acceptance, it is recommended that those who do not participate in the discussion should still be consulted about the acceptability of the decisions that are taken [4,18–20]. Notwithstanding the number of citizens who participate in the participatory programs, their numbers are still small in comparison to the wider population, particularly in a large city. This awareness is important because a city-wide plan affects all residents and not just the workshop participants. Therefore, nonparticipant evaluations of plans produced in policy planning workshops and the public determination of the plan's acceptability are crucial for the assurance that the designed plan is feasible. Nevertheless, to the best of the researchers' knowledge, only a few studies have utilized an actual case to examine how both workshop participants and nonparticipants evaluate a participatory program in terms of procedural and distributive fairness. To address this gap in the literature, the current study included both participant and nonparticipant evaluations of procedural and distributive fairness as evaluative yardsticks of participatory programs [31,33].

To clarify the terminology applied in this paper, the term procedural fairness is utilized to refer to evaluations of decision-making processes adopted during participatory programs, and the word distributive fairness means evaluations of the expected outcomes of the plan. Some debates remain concerning the differentiation of outcome fairness, outcome valence, outcome favorability, and outcome evaluation, all of which represent measures of distributive fairness; however, due to potential difficulties in precisely differentiating these psychological constructs [51–54], outcome evaluation is utilized as a term suitable for the combined evaluation of a given plan with policy planning process adopted for its institution [31,54]. In the context of this study, the outcome is not yet known, meaning that only the expectation of the outcome can be evaluated. Therefore, the terms expected outcome evaluation or expected outcome are employed in this study.

In the following analysis, the participants in the citizen panel were compared with nonparticipants but not with the participants of stakeholder meetings. Stakeholders were applicants; thus, they were highly invested in the issues and held strong opinions. Conversely, participants in the citizen panel workshops were randomly selected and were, therefore, less likely to be biased. It is possible that highly motivated citizens could be overrepresented, but the participants in the citizen panels were more comparable to random sampling from the general population. Hereafter, the term workshop participants refers to the randomly selected individuals of the citizen panels who did not participate in stakeholder meetings.

In general, workshop participants would be more likely than nonparticipants to evaluate the procedure as fairer and find the proposed plan more acceptable because participants experience the decision-making process and visualize the plan, which reflects their opinions to some extent, while nonparticipants do not. Participants may also be more motivated than nonparticipants to facilitate the execution of the environmental plan. Similarly, participants would be more likely than nonparticipants to evaluate the expected outcome as fairer because they had the opportunity to consider the plan and thus better understand the described goals.

However, it is uncertain how long such evaluations are maintained. Longitudinal data are required for understanding the duration of the effects of the participatory program and whether people maintain their evaluations once they accept a plan or if sentiments change with the passage of time. One study suggested that people do not maintain their evaluation of a plan if other opportunities for participation are not offered, concluding that the effects of a single participatory program do not last for long [29]. However, it did not compare participants and nonparticipants. This study hypothesized that participants would maintain their evaluations while nonparticipants would not. An alternative hypothesis could be that both participants and nonparticipants would alter their evaluations. Moreover, whether the evaluations are likely to change may be discovered to vary across variables. It is important to note that some variables of antecedent factors may change, while others

may not. Therefore, the present study examined changes in the variables in an exploratory manner.

2. The Case of Creating an Environmental Master Plan for Sapporo

The city of Sapporo established its first Master Plan for the Environment in 1998. This plan was supposed to remain valid for 20 years. Since its initiation, numerous specific programs have been created following the principles of the Declaration of Environmental Capital. Such policy documents include the Plan for the Promotion of Global Warming Prevention, the Energy Vision, the Vision for Biodiversity Protection, and the Directive on Environmental Education.

As relevant programs progressed, it became evident that the Master Plan needed a comprehensive revision to ensure that it could incorporate both the plans already created and upcoming policies for the achievement of sustainability-related goals. Designing a master plan for achieving sustainable goals is crucial. This master plan is the foundation for implementing a systematic series of specific plans that contain concrete measures to promote a pro-environmental lifestyle. Accordingly, the city decided to create a new Master Plan before the first Master Plan expired in March 2018. The administration intended to define the tangible goals to be achieved by 2030 and visualize the ideal future in 2050. However, substantial debates always occur in the establishment of any public commitments to goals that should be achieved. Therefore, the city decided to use participatory programs to help formulate the new Environment Master Plan and to offer citizens the inclusive opportunity to express their concerns.

The city of Sapporo conducted three-staged stepwise participatory programs to revise the Environmental Master Plan, which involved stakeholders as well as panels of randomly selected citizens. The first stage of the participatory program was held at the beginning of the planning process in September 2016. A stakeholder meeting was organized, including 23 delegates from citizens' groups, NPOs, and companies. Following the stakeholder meeting, four thousand randomly sampled residents received an invitation letter to join the workshop, and 129 residents agreed to participate. However, only 67 of the 129 randomly selected citizens (citizen panels) could attend the workshop because of the limited seating capacity of the meeting hall.

Participants were assigned to groups comprising 6–8 members, and 12 groups were formed. Intra-group discussions were held using a backcast scenario workshop to determine the goals to be achieved by 2030 and devise an ideal future image of Sapporo in 2050. After the workshop, the committee sorted through the opinions of stakeholders and citizen panels and devised a tentative plan reflecting all opinions.

In February 2017, the city of Sapporo organized the second stage of the citizen participation program. Sixty-three randomly selected citizens participated in the backcast scenario workshop. Four-thousand residents, excluding the participants of the first stage, were randomly sampled, and 130 residents agreed to participate. However, only 63 of the 130 citizens could participate in the second-stage workshop because of the limited capacity of the meeting hall. They discussed matters in the same manner as the first stage discussions, but they could refer to the tentative plan and the records produced during the previous stage. Therefore, the participants in the second stage recommended additions and modifications to the plan produced from the previous intervention. The committee then modified the tentative first-stage draft, creating a new proposed plan that reflected opinions expressed at the second workshop.

In December 2017, 50 randomly selected citizens who had not participated in the workshops in the first or second stage joined a third-stage workshop during the citizen participation program. Four-thousand residents, excluding the participants of the already held first and second stages, were randomly sampled, and 80 residents agreed to participate. However, only 50 of the 80 citizens could be accommodated due to the limited capacity of the meeting hall. Notably, the 50 participants engaged in the third stage performed a different role from the two previous citizen cohorts. At the third stage, the participants

were tasked with the appraisal of the modified plan produced in the second stage. Their mandate was to examine its feasibility and to determine whether people could understand and implement the environmental protection actions outlined in the plan. This group of citizens also assessed the planning process. For example, it evaluated whether the city bureau provided and disclosed sufficient information to citizens and whether the opinions of both the majority and the minorities were reflected. After this group of randomly selected citizens had assessed the plan at the third stage, the stakeholders had a meeting to review the proposed plan. Some of the participants of this gathering had participated in the stakeholder meeting held in the first stage. The new master plan was formally implemented in April 2018, after affording due time in January 2018 to collect remarks from the public, including children.

3. Materials and Methods

3.1. Purpose

This study explored the extent of people's acceptance of the final proposed plan to examine the changes in their evaluations and identify the determinants of acceptance from a procedural and outcome fairness perspective. The exploration was conducted to achieve two aims.

The initial aim was to compare the responses of the participatory program participant with the nonparticipants. It was hypothesized that workshop participants would be more accepting and would evaluate the process, expected outcomes, and antecedents more positively than nonparticipants (H1). The difference between participants and nonparticipants would retain over time (H1-sub). The study also examined whether the evaluations remained consistent (H2) or became more negative (Anti-H2) for both participants and nonparticipants.

The second aim is to examine the associations of relevant factors with public acceptance. It was hypothesized that (a) procedural fairness and expected outcome evaluation would affect the public acceptance of the plan (H3a); (b) openness, the reflection of voices, and representativeness would be associated with procedural fairness (H3b); and (c) public benefit, the effectiveness of sharing goals, and feasibility would be associated with the expected outcomes (H3c) (Figure 1). It was assumed that no differences would exist between participants and nonparticipants during the tested period.

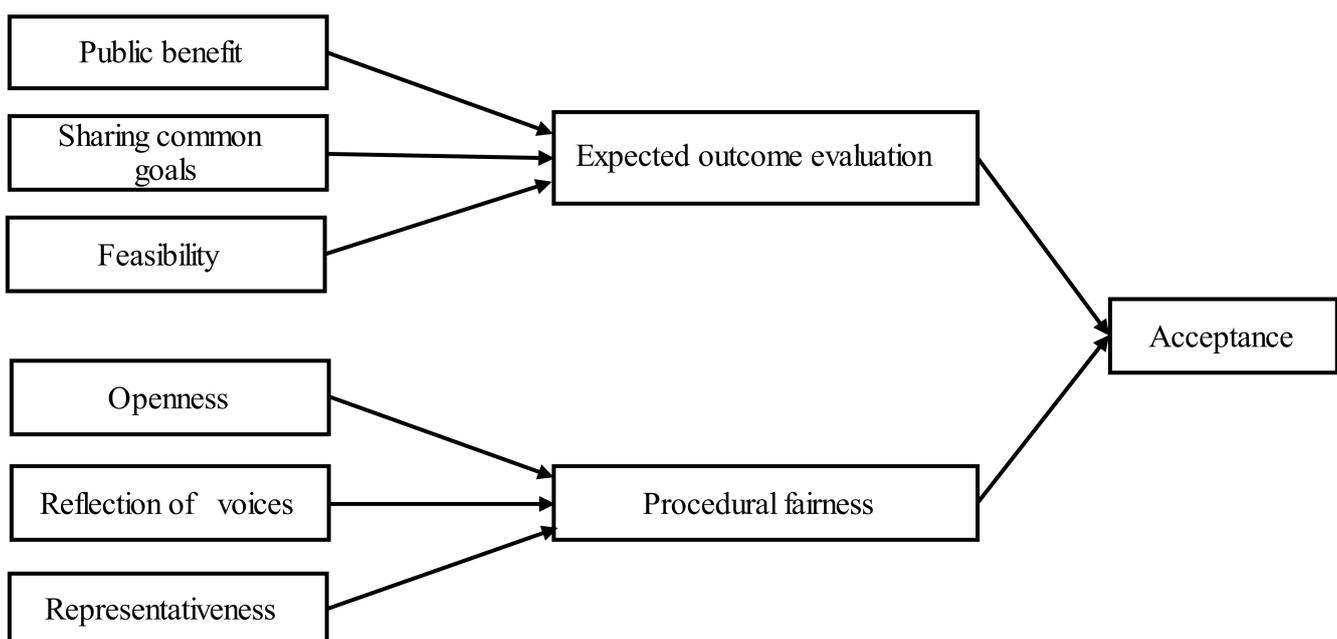


Figure 1. The initial model of acceptance based on Analysis 1.

An additional question concerning whether previous-stage participants would make different evaluations from the latter-stage participant was investigated because the participants discharged different roles. It was anticipated that no substantial differences would emerge between the types of participants, even if they took on different roles. Specifically, both sets of citizens participated in workshop discussions, signifying that they attained opportunities to express themselves and that their voices were reflected.

3.2. Procedures

A mailout survey was conducted in two waves (Figure 2).

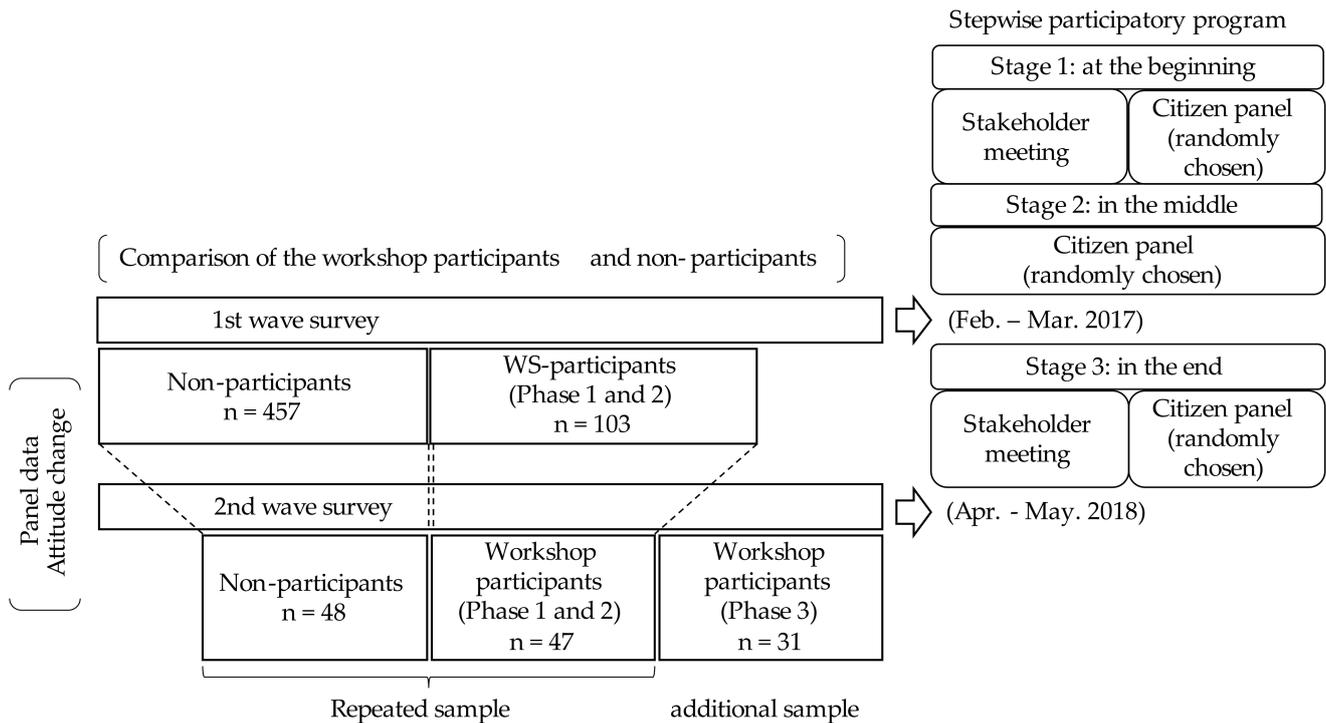


Figure 2. Survey design.

The first-wave survey Table S1 was conducted from February to March 2017, just after the second stage of the participatory program. Two datasets were obtained from the first-wave survey. The first set was compiled from the randomly selected workshop participant sample of citizens engaged in the first or second stage workshops (103 valid responses out of 130; 79.2% collection rate). The stakeholders who participated in the stakeholder meetings were not included in the participant sample set. The second dataset was collected from the nonparticipant sample and comprised 457 valid responses, where 1000 residents (18 years old and above) of Sapporo were randomly selected from a residential list stratified according to the population distribution by age, sex, and residential ward. Residents who had been sampled in the previous two workshops were removed in advance before extracting the nonparticipant sample. A 45.7% collection rate was achieved, illustrating a high degree of representativeness vis-à-vis regular mailout surveys, which usually receive less than 20% response rates.

The second-wave survey Table S2 was conducted from April to May 2018, just after the new plan was implemented. The dataset consisted of repeated samples and additional samples. The repeated sample was collected from the respondents of the first-wave survey who had agreed to respond to the follow-up survey. In addition, a new sample of participants of the third-stage workshop was collected in this survey round. A total of 47 valid responses were obtained from the former 81 first and second workshop participants, and 48 valid responses were obtained from 101 nonparticipants. A total of 31 valid responses were obtained from the 50 participants of the third-stage workshop for the additional sample.

3.3. Questionnaires

The questionnaire contents of the two-wave survey were identical at both time points, and all items were measured using a five-point Likert-like scale ranging from 1 (do not agree at all) to 5 (agree completely).

Acceptance of the Plan: Acceptance of the proposed plan was measured through two items: "I am satisfied with the plan" and "I accept the plan, both the process and the expected outcome" (Cronbach α s 0.85).

Procedural Fairness: Procedural fairness was measured by two items asking for an evaluation of the decision process: "On the whole, the planning process was fair", and "The planning process that citizens were able to participate in was fair overall" (Cronbach α s 0.83).

Antecedent Factors of Procedural Fairness: Openness, the reflection of voices, and representativeness were measured as the antecedent factors of procedural fairness. Openness was measured via four items: "The city bureau provides and discloses sufficient information to citizens", "The city bureau provides plain explanations to citizens", "Citizens have enough opportunities to express their opinions during planning", and "The opportunity for participation in planning is open to everyone" (Cronbach α s 0.82). Reflection of voice was measured by four items: "Opinions expressed in the workshops will be reflected in the plan", "This plan was made on the basis of opinions expressed in the workshops", "The minority opinion was respected in the workshops", and "Opinions expressed in the workshops included various values" (Cronbach α s 0.72). Representativeness was measured by two reversed items: "Opinions of workshop participants did not represent the opinions of all citizens, as only those of highly interested in the issue participated", and "Workshop participants did not represent all citizens because the number of participants was small" (Cronbach α s 0.61). The scores of these items were reversed to enable larger scores to be more representative.

Expected Outcome Evaluation: The expectation of outcomes was measured through two items: "Ultimately, the proposed plan will have a good outcome for Sapporo in the end," and "I evaluate the plan as good as a whole" (Cronbach α s 0.74).

Antecedent Factors of Expected Outcome Evaluation: Public benefit, the effectiveness of sharing common goals, and feasibility were measured as the antecedent factors of expected outcome evaluations. Public benefit was measured using two items: "The ideal future image of Sapporo is described in the plan", and "It will be good for the whole society if the plan is realized" (Cronbach α s 0.73). The effectiveness of sharing common goals was measured via two items: "If many citizens share this plan, the goal will be achieved", and "If many citizens share this plan, the possibility of achieving the goal is increased" (Cronbach α s 0.85). Feasibility was measured by two items: "This plan is feasible" and "This plan is realistic" (Cronbach α s 0.83).

3.4. Analytical Strategy

This section outlines the three analyses performed for the study. Analysis 1 was performed on the dataset obtained from the first-wave survey ($n = 103$ for workshop participants, $n = 457$ for nonparticipants) to compare the evaluations of workshop participants with the nonparticipants. A multivariate analysis of variance (MANOVA) was performed with the independent variable of participation (2: workshop participants or nonparticipants) controlling for age and gender, and the dependent variables of acceptance of the plan, procedural fairness and its three antecedents (openness, reflection of voice, representativeness), and expected outcome evaluation and its three antecedents (public benefit, sharing the common goal, feasibility). Next, multiple group path analyses were performed using structural equation modeling (SEM), for which the initial model presented in Figure 1 was assumed. The parameters for each group were estimated, respectively, and all variables were standardized within each group so that the path coefficients of the two groups were comparable. The initial model was then modified with reference to the Lagrangian multiplier (LM) test and Wald chi-square stats. Paths recommended by both

groups were selected when adding a new path because different paths were not presumed between the workshop participants and the nonparticipants.

Analysis 2 was accomplished using the repeated sample only for the respondents who took both waves of surveys ($n = 47$ for workshop participants in the first and second stages, $n = 48$ for nonparticipants) to explore the changes in evaluations. A repeated measures MANOVA was conducted using the same dependent variables as Analysis 1 and the independent variable of participation (2: workshop participants or nonparticipants), controlling for age and gender. Next, multiple group path analyses were executed through SEM using only acceptance, procedural fairness, and expected outcome evaluations, but not the antecedents of procedural fairness and expected outcome evaluations because of the restricted degrees of freedom due to the number of variables. Instead, correlation coefficients were calculated across time between the variables, including the antecedents. The initial model in Analysis 2 indicated that the procedural fairness and expected outcomes determined the acceptance and that the variables in Wave 1 influenced the same variable in Wave 2, i.e., acceptance in Wave 1 influenced acceptance in Wave 2, procedural fairness in Wave 1 influenced procedural fairness in Wave 2, and the expected outcomes in Wave 1 influenced the expected outcomes in Wave 2. The variables were standardized before the calculation. Like Analysis 1, the initial model was modified with reference to LM and Wald chi-square stats.

Analysis 3 addressed the additional study question. The dataset from the second-wave sample survey ($n = 47$ for workshop participants in the first and second stages, $n = 48$ for nonparticipants, $n = 31$ for the workshop participants in the third stage) was utilized to confirm whether a difference could be observed between workshop participants in the planning stage (first and second stages), the workshop participants in the assessment stage (the third stage), and the nonparticipants. The possibility of finding differences between workshop participants in the third stage and nonparticipants was expected, but no differences were predicted to occur between the workshop participants in the former stages and the workshop participants in the third stage. A MANOVA was performed as with Analysis 1. The dependent variables remained identical to Analyses 1 and 2, but the independent variable was participation (3: workshop participants in the first and second stages, nonparticipants, workshop participants in the third stage), controlling for age and gender. A Tukey–Kramer adjustment was applied for the post hoc test to examine which pairs of groups were significantly different (significance level 0.05).

4. Results

4.1. Demographics

Table 1 displays the numbers and percentages of the demographics of each sample set. Females outnumbered males. This distribution could have occurred because of the large proportion of older people, and the longevity ratio of females to males is greater in elders. This distribution is representative of the population of the elderly in Sapporo. However, the distribution of respondents of the third workshop was skewed toward females, despite the presence of a slightly larger ratio of younger respondents (20s and under).

Table 1. Demographic characteristics.

			Gender		Age					Occupation								
			Males	Females	20s and Lower	30s	40s	50s	60s	70s and Over	Homemaker	Part-Time Job	Non-Regular Employment	Regular Employee	Self-Employed	Retired	Students	Others
First wave	Workshop participants (%)		44 (42.7)	59 (57.3)	10 (9.7)	11 (10.7)	23 (22.3)	17 (16.5)	29 (28.2)	13 (12.6)	16 (15.7)	11 (10.8)	3 (2.9)	40 (39.2)	8 (7.8)	17 (16.7)	4 (3.9)	3 (2.9)
	Nonparticipants (%)		192 (42.3)	262 (57.7)	42 (9.2)	57 (12.5)	90 (19.7)	80 (17.5)	102 (22.4)	85 (18.6)	90 (19.9)	79 (17.4)	23 (5.1)	149 (32.9)	32 (7.1)	53 (11.7)	13 (2.9)	14 (3.1)
Second wave	Repeated sample	Workshop participants (%)	17 (36.2)	30 (63.8)	7 (14.9)	12 (25.5)	8 (17.0)	12 (25.5)	6 (12.8)	2 (4.3)	11 (23.4)	8 (17.0)	2 (4.3)	11 (23.4)	5 (10.6)	5 (10.6)	2 (4.3)	3 (6.4)
		Nonparticipants (%)	24 (50.0)	24 (50.0)	8 (16.7)	13 (27.1)	10 (20.8)	10 (20.8)	7 (14.6)	0 (0.0)	7 (14.9)	8 (17.0)	1 (2.1)	23 (48.9)	2 (4.3)	6 (12.8)	0 (0.0)	0 (0.0)
	Additional sample	Third Workshop participants (%)	7 (22.6)	24 (77.4)	7 (22.6)	6 (19.4)	6 (19.4)	5 (16.1)	7 (22.6)	0 (0.0)	7 (22.6)	8 (25.8)	2 (6.5)	8 (25.8)	0 (0.0)	3 (9.7)	1 (3.2)	2 (6.5)

4.2. Analysis 1: The First-Wave Sample

The dataset from the first wave was used for Analysis 1 to examine the differences between workshop participants and nonparticipants. The MANOVA results revealed significant effects of participation on all variables, indicating that the workshop participants accepted the plan more, evaluated the process as fairer, and expected better outcomes than nonparticipants (Table 2). Similarly, the workshop participants rated the antecedents more positively than nonparticipants. These results supported H1. However, both the workshop participants and nonparticipants rated openness and representativeness poorly. Respondents evaluated the city information disclosure and opportunity for participation as insufficient and did not believe that the workshop participants fully represented the citizens of the city. Nevertheless, both workshop participants and nonparticipants positively rated the other antecedents such as reflection of voices, public benefit, shared common goals, and feasibility.

Table 2. Means and standard deviations of the rating accomplished by participants and the MANOVA test scores of the Wave 1 sample.

	Nonparticipants		Workshop Participants		F	p
	Mean	(SD)	Mean	(SD)		
Acceptance of the plan	3.429	(0.765)	3.839	(0.734)	23.82	<0.001
Procedural fairness	3.181	(0.683)	3.768	(0.699)	61.23	<0.001
Openness	2.576	(0.756)	2.809	(0.758)	8.82	0.003
Reflection of voices	3.177	(0.614)	3.550	(0.622)	31.07	<0.001
Representativeness	2.259	(0.821)	2.663	(0.877)	19.50	<0.001
Expected outcome evaluation	3.810	(0.776)	4.111	(0.589)	13.32	<0.001
Public benefit	4.025	(0.791)	4.247	(0.587)	6.83	0.009
Sharing common goals	3.781	(0.829)	4.174	(0.671)	19.44	<0.001
Feasibility	3.254	(0.769)	3.474	(0.720)	7.04	0.008

Note: df = (1, 538) for all variables.

The path analysis results indicated a good fitness of the initial model (Nobs = 528, $\chi^2(36) = 137.927$, $p < 0.0001$, AGFI = 0.883, CFI = 0.946, RMSEA = 0.104, AIC = 245.927; nonparticipants: Nobs = 437, GFI = 0.960, SRMR = 0.066, NIF = 0.942; workshop participant: Nobs = 91, GFI = 0.921, SRMR = 0.116, NIF = 0.863). These results suggested that (a) procedural fairness and the expected outcome were associated with acceptance; (b) public benefit, sharing common goals, and feasibility were associated with the expected outcome evaluation; and (c) openness and the reflection of voices were associated with procedural fairness. No critical difference was discovered between the workshop participants and nonparticipants with respect to the associated factors. However, the SEM calculation suggested a modified model demonstrating a better fit: the path from representativeness to procedural fairness was removed, and paths were added from public benefit to acceptance and from openness to acceptance in this version (Nobs = 528, $\chi^2(34) = 91.776$, $p < 0.0001$, AGFI = 0.909, CFI = 0.969, RMSEA = 0.080, AIC = 203.776; nonparticipants: Nobs = 437, GFI = 0.972, SRMR = 0.050, NIF = 0.964; workshop participant: Nobs = 91, GFI = 0.933, SRMR = 0.103, NIF = 0.898; Figure 3; see also covariances in antecedent factors described in Table 3). Representativeness was not significantly associated with procedural fairness. Public benefit and openness had direct effects on acceptance, suggesting that these two antecedents were more important for acceptance among the antecedent factors. Overall, procedural fairness and the expected outcomes were associated with acceptance, indicating that H3a was almost supported. However, the expected outcome was not significantly associated with acceptance in workshop participants, suggesting that workshop participants valued procedural fairness but valued outcomes less when considering the acceptance of the plan. Public benefit, sharing common goals, and feasibility were associated with the evaluation of expected outcomes in both sample sets, revealing that H3c was supported.

However, representativeness was not associated with procedural fairness, which did not support H3b in part. Alternatively, openness and reflection of voices were associated with procedural fairness, partially supporting H3b. Thus, representativeness might not be relevant to the procedural fairness of participatory programs.

Table 3 shows the covariances of antecedent factors.

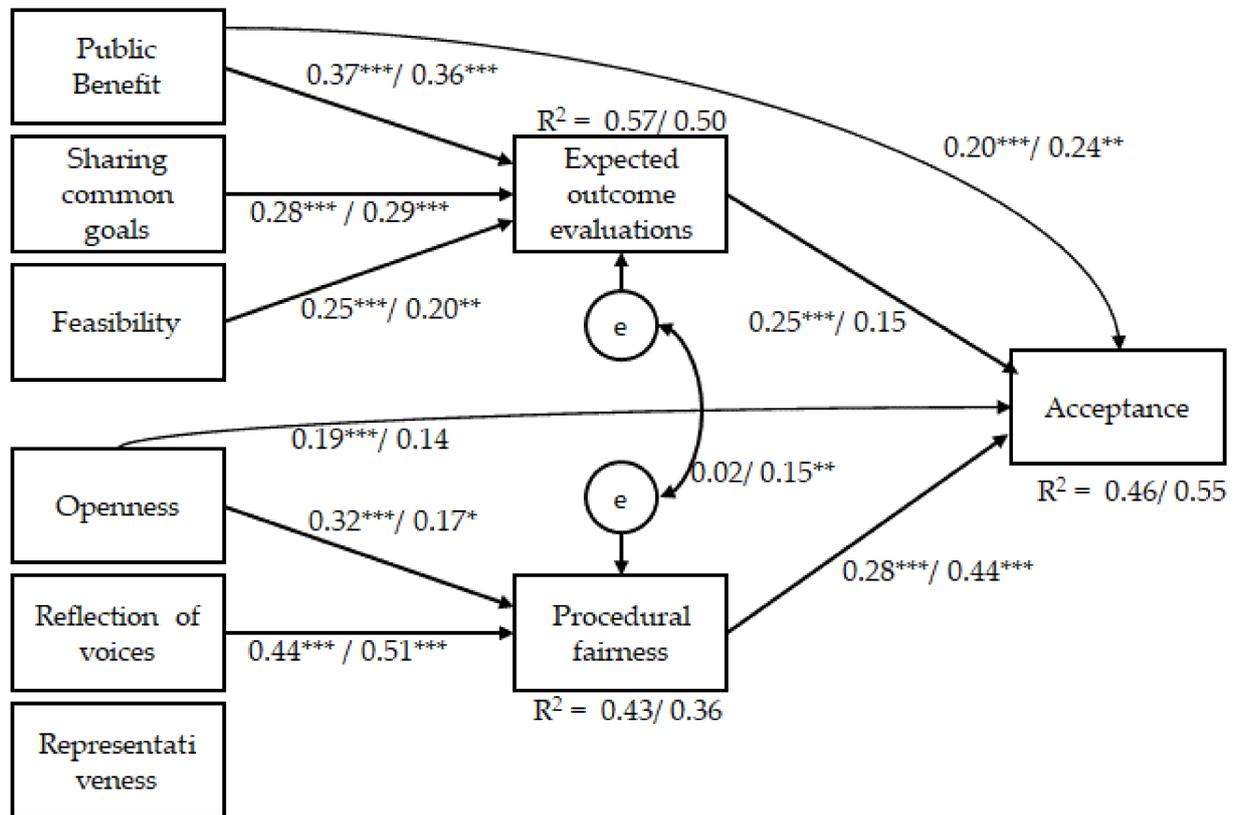


Figure 3. Associations explaining acceptance (modified model in analysis 1). Notes: left, nonparticipants; right, workshop participants. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. Nonparticipants, $n = 437$; workshop participants, $n = 91$.

Table 3. Covariances of antecedent factors according to the structural equation modeling results from Analysis 1.

	1	2	3	4	5	6
1. Openness	-	0.329 ***	0.164	0.249 **	0.097	0.238 *
2. Reflection of voices	0.459 ***	-	0.083	0.363 ***	0.207 *	0.348 ***
3. Representativeness	0.328 ***	0.255 ***	-	0.003	-0.075	0.031
4. Public benefit	0.188 ***	0.412 ***	0.084	-	0.450 ***	0.424 ***
5. Sharing common goals	0.218 ***	0.467 ***	0.090	0.560 ***	-	0.372 ***
6. Feasibility	0.296 ***	0.165 ***	0.165 **	0.505 ***	0.538 ***	-

Notes: above right side, nonparticipants; below left side, workshop participants. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. Nonparticipants, $n = 437$; workshop participants, $n = 91$.

4.3. Analysis 2: Repeated Sample

We used the repeated sample who had responded twice in Analysis 2 to observe any changes in their evaluations. The repeated measures MANOVAs revealed that the main effects of participation on all variables were significant, which indicated that the workshop participants overall evaluated more positively than the nonparticipants supporting H1-sub (Table 4). The effects of the repeated measures were not significant for procedural fairness, openness, reflection of voices, and representativeness, indicating that the importance of

procedural fairness and its antecedent factors did not decrease. These results supported H2. On the other hand, the effects of the repeated measures were marginally significant for acceptance, public benefit, sharing common goals, and feasibility, indicating the slight decrease in importance related to acceptance and the antecedents of the expected outcome evaluation. These results favored Anti-H2, although not robustly. No interactions were observed for all variables.

Table 4. Means and standard deviations of participant ratings and the MANOVA test scores of the repeated sample.

	Nonparticipants				Workshop Participants				Main Effect of		Main Effect of		Interaction	
	First Wave		Second Wave		First Wave		Second Wave		Participant		Repeated		F	<i>p</i>
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	F	<i>p</i>	F	<i>p</i>		
Acceptance of the plan	3.522	(0.846)	3.245	(0.902)	3.944	(0.693)	3.946	(0.871)	14.92	0.000	3.06	0.084	2.56	0.113
Procedural fairness	3.146	(0.792)	3.096	(0.812)	3.830	(0.662)	3.915	(0.830)	24.52	<0.001	0.10	0.757	1.72	0.193
Openness	2.500	(0.638)	2.571	(0.800)	3.016	(0.795)	3.027	(0.831)	11.48	0.001	0.54	0.466	0.18	0.670
Reflection of voices	3.120	(0.599)	3.128	(0.571)	3.596	(0.607)	3.596	(0.702)	15.74	<0.001	0.02	0.902	0.02	0.902
Representativeness	2.208	(0.904)	2.385	(0.895)	2.830	(0.968)	2.819	(1.050)	10.86	0.001	0.53	0.470	0.67	0.415
Expected outcome evaluation	3.813	(0.848)	3.677	(0.948)	4.138	(0.508)	4.106	(0.699)	7.62	0.007	1.00	0.321	0.38	0.539
Public benefit	4.177	(0.718)	3.947	(0.985)	4.383	(0.513)	4.298	(0.749)	4.38	0.039	3.70	0.058	0.80	0.375
Sharing common goals	3.875	(0.914)	3.698	(0.909)	4.106	(0.642)	3.957	(0.743)	2.89	0.093	3.42	0.068	0.03	0.874
Feasibility	3.260	(0.592)	2.990	(0.696)	3.457	(0.758)	3.436	(0.770)	7.74	0.007	3.81	0.054	2.78	0.099

Note: *df* = (1, 87) for all variables. Nonparticipants, *n* = 48; workshop participants, *n* = 47.

The results of the multiple groups path analysis performed via SEM indicated a reasonable fitness of the initial model (Nobs = 87, $\chi^2(16) = 32.005$, $p > 0.01$, AGFI = 0.750, CFI = 0.949, RMSEA = 0.153, AIC = 83.005; nonparticipants: Nobs = 43, GFI = 0.959, SRMR = 0.051, NIF = 0.961; workshop participant: Nobs = 44, GFI = 0.852, SRMR = 0.207, NIF = 0.870). These results indicated that the procedural fairness and expected outcome were constantly associated with acceptance in both waves and both in workshop participants and nonparticipants. However, the SEM calculation suggested a more pertinent modified model (Nobs = 87, $\chi^2(16) = 20.910$, $p > 0.182$, AGFI = 0.182, CFI = 0.984, RMSEA = 0.085, AIC = 72.910; nonparticipants: Nobs = 43, GFI = 0.954, SRMR = 0.003, NIF = 0.954; workshop participant: Nobs = 44, GFI = 0.908, SRMR = 0.079, NIF = 0.929). The path from acceptance in the first wave to acceptance in the second wave was removed in the modified model, and a path was added to both sample sets from procedural fairness in the first wave to expected outcome evaluation in the second wave (Figure 4). The results suggested that the initial acceptance of the plan was not directly connected to acceptance in the next period. Notably, procedural fairness in the first wave influenced the expected outcome evaluations in the second wave, particularly in workshop participants. This result implied that workshop participants of the earlier stages maintained their evaluation of the process over the long term and that their evaluation of the process was connected to their expectations of the outcomes, even if they did not participate in the workshop in the third stage.

Table A1 in Appendix A presents the correlations between variables across repeated measures. Naturally, most variables of Wave 1 correlated with equivalent variables in Wave 2. However, the coefficient of representativeness in Waves 1 and 2 was small in the nonparticipant sample, suggesting that consistency was not assured. Furthermore, representativeness in workshop participants, as well as nonparticipants, in both Waves 1 and 2 was likely to correlate less than other variables. Hence, representativeness could be unique among the chosen variables potentially irrelevant to acceptance and procedural fairness.

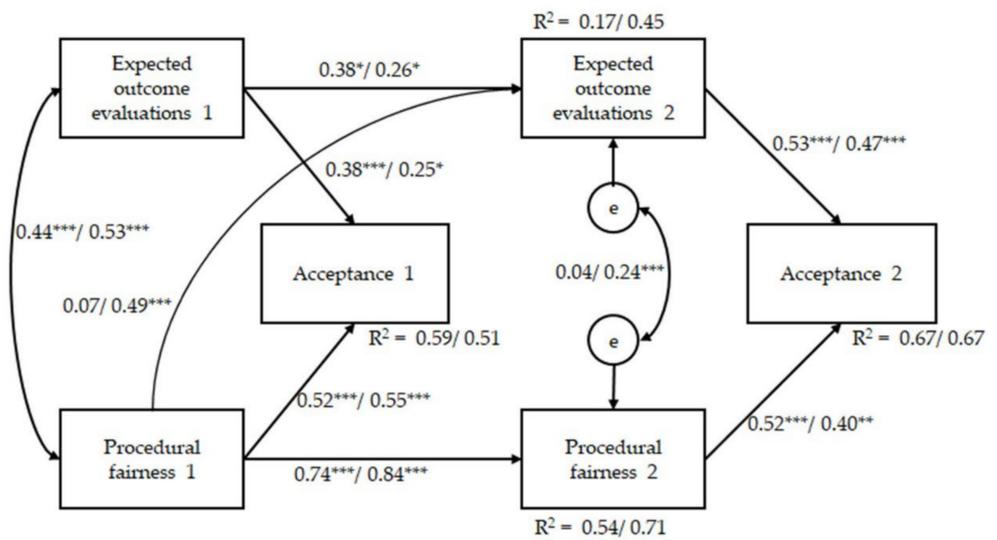


Figure 4. Associations explaining acceptance using repeated measures (modified model for analysis 2). *Notes:* left, nonparticipants; right, workshop participants. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. Nonparticipants, $n = 43$; workshop participants, $n = 44$.

4.4. Analysis 3: Second-Wave Sample

The second-wave dataset was employed to compare the participants from the third-stage plan evaluations with the previous workshop participants and nonparticipants. The MANOVA results indicated no significant difference in all variables between the workshop participants in the former stages and the third-stage workshop participants (Table 5). The comparison between the third-stage workshop participants and the nonparticipants revealed significant differences in the ratings of procedural fairness, openness, reflection of voices, and the evaluation of expected outcomes, but not for acceptance, representativeness, public benefit, sharing common goals, and feasibility. Overall, the evaluations of the third workshop participants were found to be in-between the workshop participants of the previous stages and the nonparticipants, even though no significant differences were found between the third workshop participants and the workshop participants of the previous stages.

Table 5. Means, standard deviations, and test scores using MANOVA for the Wave 2 sample.

	Repeated Respondents				Third Workshop			
	Nonparticipants		Workshop Participants		Participants		F	p
	Mean	(SD)	Mean	(SD)	Mean	(SD)		
Acceptance of the plan	3.245 ^a	(0.902)	3.946 ^b	(0.871)	3.629 ^{a,b}	(0.752)	7.54	0.001
Procedural fairness	3.096 ^a	(0.812)	3.915 ^b	(0.830)	3.707 ^b	(0.840)	15.26	<0.001
Openness	2.571 ^a	(0.800)	3.027 ^b	(0.831)	3.008 ^b	(0.955)	5.74	0.004
Reflection of voices	3.128 ^a	(0.571)	3.596 ^b	(0.702)	3.621 ^b	(0.809)	8.54	<0.001
Representativeness	2.385 ^a	(0.895)	2.819 ^b	(1.050)	2.267 ^{a,b}	(0.907)	3.53	0.033
Expected outcome evaluation	3.677 ^a	(0.948)	4.106 ^b	(0.699)	4.033 ^b	(0.754)	4.28	0.018
Public benefit	3.947 ^a	(0.985)	4.298 ^b	(0.749)	4.133 ^{a,b}	(0.776)	3.06	0.051
Sharing common goals	3.698 ^a	(0.909)	3.957 ^a	(0.743)	3.817 ^a	(0.996)	1.76	0.177
Feasibility	2.990 ^a	(0.696)	3.436 ^b	(0.770)	3.250 ^{a,b}	(0.838)	4.14	0.018

Note: $df = (2, 113)$ for all variables. Letters in small characters next to mean scores (^a, ^b) indicate results of least square tests: identical symbols indicate not found the significant differences; discrete symbols indicate significant differences (significance level 0.05).

5. Discussion

A comparison of the public acceptance of the Environment Master Plan for Sapporo city was performed between workshop participants and nonparticipants through three

analyses. Overall, workshop participants expected the plan to deliver positive outcomes, perceived the decision process as fair, and evaluated the plan as acceptable more than nonparticipants, supporting H1. In addition, the results of Analysis 2 indicated that the evaluations by both workshop participants and nonparticipants, including acceptance, procedural fairness, and the expected outcomes, were positively maintained over time, supporting H2. These results suggested that the presence of another opportunity for civic participation could ensure the maintenance of positive evaluations, even if they did not participate in the subsequent opportunity. However, it is possible that only those who had a positive attitude to the participatory programs were likely to respond repeatedly. Conducting a follow-up survey would be required, adding a new sample of people who have never responded to similar surveys to increase confidence in our findings.

The associations between acceptance and the two fairness criteria of procedural fairness and the expected outcome evaluation had consistent effects on acceptance in all samples during Analyses 1 and 2. These results demonstrated the robustness of procedural and outcome fairness, supporting H3a. Notably, workshop participants displayed an emphasis on procedural fairness; the evaluation of expected outcomes was weakly associated with acceptance in Analysis 1 (Figure 3), and procedural fairness in Wave 1 had effects on the expected outcomes during Wave 2 in Analysis 2 (Figure 4). These results verified the significance of procedural fairness as an evaluative yardstick for participatory programs as well as for the significance of stepwise participatory programs for the execution of a fair decision process.

However, representativeness was not associated with procedural fairness in Analysis 1 (Figure 3) and was less correlated with other variables in Analysis 2 (Table A1 in Appendix A). These results suggest that people do not place much importance on representativeness, at least as an antecedent of procedural fairness. It could also be considered that people could have believed that only highly interested citizens participated in the workshops, and thus did not necessarily represent the views of all city residents. However, they respected the opinions articulated by the participants and, hence, accepted their decisions. Further research is required to determine whether repeated participatory programs are sufficient or whether participatory programs should ensure representativeness.

Some limitations in the present study's methodology and analyses must be acknowledged. First, only a small workshop participant sample was obtained for the three-staged program because of the overall paucity of participants. Furthermore, although the participants were randomly selected for the initial sampling, the participation could be skewed toward citizens who were highly concerned about environmental issues and may not represent the wider population of Sapporo. Nevertheless, the workshop participants in the citizen panels were different from the stakeholders, who were the delegates of citizens' groups, NPOs, and companies highly interested in environmental issues. Thus, the comparison of workshop participants who were randomly sampled with nonparticipants was justified. Nonetheless, further research is required to compare stakeholders with randomly selected workshop participants, ideally with larger sample sets. Second, the repeated samples in Analysis 2 comprised only the respondents who agreed to complete the questionnaire again. Thus, respondents with more positive attitudes could be over-represented, affecting the results concerning the stability of the evaluations, including procedural fairness. It would be better to contemplate whether those who did not respond to the request for the repeated filling of the survey could change the results, although it is impossible to trace them. Third, a full model path analysis including all variables could not be conducted in Analysis 2 because of the small sample sets. This lack limits the results, although the correlations between variables are displayed. A larger sample is necessary for conducting a full model analysis with a repeated sample.

Despite these limitations, this study successfully demonstrated the significance of multiple stepwise participatory programs using the case study of the development of the Environmental Master Plan by Sapporo city in Japan and presented analyses of relevant empirical data.

6. Conclusions

This paper proposed multiple stepwise participatory programs for sustainability planning as a variation combining the stakeholder process and citizen panel. A case of designing an Environmental Master Plan to ensure a sustainable future for Sapporo city in Japan was introduced. Two waves of surveys were conducted to examine the evaluations of participants and nonparticipants after the workshops. The results supported the significance of procedural fairness and outcome evaluations to attain public acceptance. Furthermore, procedural fairness was found to be more valuable, particularly by workshop participants. The current paper provides quantitative empirical evidence, demonstrating the significance of procedural and distributive fairness as an evaluative yardstick.

Numerous researchers and policy practitioners have advocated the importance of public and citizen participation [2], and many participatory programs on environment policy planning have actually been implemented; however, to the best of the knowledge of the authors of the present study, scant extant literature has reported case studies of the implementation of multiple stepwise participatory programs involving stakeholders and randomly selected citizens, using repeated measures, and measuring the public acceptance of residents who did not participate in the programs using procedural fairness as an evaluative yardstick. This study added a valuable contribution that examined an actual case study of a three-stage participatory program undertaken toward the institution of an Environmental Master Plan for a city. It is also notable that the empirical results of the current study demonstrated the significance of procedural fairness and its connection to public acceptance.

It is unrealistic to expect that all residents can participate in policy planning for sustainability in today's large-scale society. However, once such a policy is implemented, it influences all residents. Therefore, participatory programs should be designed carefully so that the policy is acceptable to as many residents as possible. It is not that a single participatory program would be meaningless. Obviously, any participatory program, stakeholder meetings or mini-publics would be more valuable than the lack of public engagement. Many case studies have reported that single-interventions of citizen participation encourage procedural fairness [55,56]. Notwithstanding this promise, the insufficiency of a single-intervention participatory program should be recognized to mitigate the back-firing of proposed policies and to ensure the increased efficacy of sustainability-related strategies [21,28,29,31,57]. Therefore, the decision-making processes involving the broader public have been proposed [58], some of which are extended to participatory backcasting [39]. Since people are more likely to accept new policies adopted through more visible and transparent multiple stepwise processes involving citizens; prioritizing such factors will help more people perceive the decisions being achieved using fair processes. Nevertheless, only a few studies have quantitatively proved the effectiveness of aspects of procedural and distributive fairness in sustainability-related policymaking, even though the literature increasingly emphasizes procedural fairness [55,59]. The current study contributes both theoretically and practically to the body of research on participatory programs and procedural fairness, adding to it a case study on good practices along with quantitative empirical evidence. However, the stepwise participatory program introduced in this study is not the only measure of engaging the public in policymaking decisions. More case studies should be accumulated across various societies and cultures.

The disadvantages of participatory programs conducted through multiple stages should also be considered: such processes are time-consuming and expensive to execute. The city of Sapporo took two years to develop its new Environmental Master Plan to engage in a three-stage participatory program. Despite the difficulties, the city administrators committed to the execution of the multi-stage participatory program, granting it necessary and vital for the establishment of a widely accepted vision for the city over the next 20 years. Future studies should examine the better measures of executing multiple stepwise participatory programs toward the development of sustainability-related policies and plans.

This study demonstrated the significance of multiple stepwise participatory programs that can foster procedural and outcome fairness and can lead to greater public acceptance of policies. It undertook a case study describing the development of a new Environmental Master Plan for the city of Sapporo in Japan. Hopefully, this case study can serve as a useful example of sustainable environmental policymaking for future researchers and policymakers.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/su14063403/s1>, Table S1: Simple tabulations with the original Japanese (1st wave), Table S2: Simple tabulations with the original Japanese (2nd wave).

Author Contributions: Conceptualization, S.O. and M.Y.; methodology, S.O. and S.M.; software, validation, and formal analysis, S.M.; investigation, resources, and data curation, S.O., M.Y. and S.M.; writing (original draft preparation), S.O.; writing (review and editing), S.O. and M.Y.; visualization, S.O.; supervision, project administration, and funding acquisition, S.O. All authors have read and agreed to the published version of the manuscript.

Funding: This research project was funded by Topic-Setting Program to Advance Cutting-Edge Humanities and Social Sciences Research (Responding to Real Society), Japanese Society for the Promotion of Science (Grant Number 15654768).

Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Ethics Committee of Center for Experimental Research in Social Sciences, Hokkaido University (protocol code 28-7, 9 May 2016).

Informed Consent Statement: Patient consent was waived because the mailout survey was conducted anonymously. The data set was provided by Environmental Bureau Sapporo City after they completely checked and deleted personal information.

Data Availability Statement: The data present in the study are available in the Supplementary Material.

Acknowledgments: We would like to thank the staff of Environmental Bureau Sapporo City, Hokkaido Environmental Foundation, Environmental Partnership Office Hokkaido, and all those engaged in organizing the participatory programs. We are also grateful to the participants of the workshops and all respondents of the survey.

Conflicts of Interest: The authors declare no conflict of interest. The funders had no role in the study's design; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

Appendix A

Table A1. Correlations of the measures repeated in analysis 2.

		Wave 1										Wave 2							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Wave 1	1. Acceptance 1	-	0.690 ***	0.539 ***	0.496 ***	0.151	0.608 ***	0.405 **	0.240	0.308 *	0.408 **	0.530 ***	0.199	0.498 ***	-0.180	0.398 **	0.090	0.181	0.323 *
	2. Procedural fairness 1	0.665 ***	-	0.530 ***	0.559 ***	0.282	0.441 **	0.403 **	0.182	0.248	0.567 ***	0.737 ***	0.413 **	0.700 ***	-0.091	0.238	0.151	0.147	0.167
	3. Openness 1	0.395 **	0.483 ***	-	0.530 ***	0.114	0.330 *	0.392 **	0.207	0.127	0.334 *	0.465 **	0.433 **	0.368 *	0.121	0.034	0.158	0.015	0.245
	4. Reflection of voice 1	0.411 **	0.586 ***	0.198	-	0.344 *	0.518 ***	0.452 *	0.285	0.205	0.340 *	0.511 ***	0.271	0.596 ***	0.110	0.218	0.095	0.182	0.092
	5. Representativeness 1	0.084	0.231	0.193	0.133	-	0.132	0.085	0.102	0.042	0.046	0.278	-0.084	0.147	-0.062	-0.120	0.014	-0.106	0.002
	6. Expected outcome evaluation 1	0.557 ***	0.536 ***	0.295	0.286	0.073	-	0.716 ***	0.495 ***	0.378 *	0.360 *	0.337 *	0.076	0.516 ***	0.118	0.413 **	0.201	0.429 **	0.265
	7. Public benefit 1	0.566 ***	0.291	-0.045	0.275	0.139	0.520 ***	-	0.530 ***	0.332 *	0.423 **	0.444 **	0.105	0.425 **	0.150	0.351 *	0.363 *	0.321 *	0.179
	8. Sharing common goals 1	0.525 ***	0.310 *	0.216	0.170	0.193	0.489 ***	0.473 **	-	0.359 *	0.434 **	0.155	0.285	0.229	0.326 *	0.386 **	0.170	0.467 **	0.194
	9. Feasibility 1	0.248	0.316 *	0.229	0.316 *	0.224	0.594 ***	0.440 **	0.363 **	-	0.306 *	0.110	0.170	0.313 *	0.273	0.435 **	0.220	0.391 **	0.412 **
Wave 2	10. Acceptance 2	0.666 ***	0.603 ***	0.446 **	0.473 **	0.100	0.348 *	0.362 *	0.441 *	0.127	-	0.638 ***	0.616 ***	0.662 ***	0.173	0.641 ***	0.415 **	0.457 **	0.334 *
	11. Procedural fairness 2	0.737 ***	0.836 ***	0.358 *	0.570 ***	0.251	0.468 **	0.362 *	0.493 ***	0.184	0.756 ***	-	0.457 **	0.680 ***	-0.072	0.222	0.162	-0.044	0.048
	12. Openness 2	0.290	0.402 **	0.663 ***	0.297	0.278	0.178	0.007	0.027	0.057	0.252	0.349 *	-	0.484 ***	0.293	0.329 *	0.250	0.278	0.265
	13. Reflection of voice 2	0.749 ***	0.691 ***	0.487 ***	0.576 ***	0.039	0.445 **	0.338 *	0.372 *	0.202	0.743 ***	0.800 ***	0.391 **	-	-0.043	0.346 *	0.130	0.501 *	0.187
	14. Representativeness 2	0.222	0.267	0.210	0.140	0.571 ***	0.419 **	0.303 *	0.326 *	0.463 **	0.078	0.198	0.309 *	0.198	-	0.331 *	0.299	0.433 **	0.289
	15. Expected outcome evaluations 2	0.683 ***	0.620 ***	0.364 *	0.467 **	0.054	0.537 ***	0.440 *	0.536 ***	0.444 **	0.773 ***	0.765 ***	0.233	0.751 ***	0.249	-	0.642 ***	0.719 ***	0.631 ***
	16. Public benefit 2	0.520 ***	0.342 **	0.180	0.427 **	-0.070	0.377 *	0.517 ***	0.406 **	0.422 **	0.373 *	0.413 **	0.064	0.432 **	0.011	0.575 ***	-	0.575 ***	0.665 ***
	17. Sharing common goals 2	0.462 **	0.309 *	0.130	0.303 *	-0.053	0.200	0.236	0.280	0.144	0.483 ***	0.529 ***	0.127	0.406 **	-0.115	0.599 ***	0.713 ***	-	0.631 ***
	18. Feasibility 2	0.492 ***	0.412 **	0.136	0.471 **	-0.002	0.406 **	0.489 ***	0.367 *	0.483 ***	0.562 ***	0.518 ***	0.105	0.551 ***	0.217	0.733 ***	0.437 *	0.526 ***	-

Notes: above right, the nonparticipants; below left, the workshop participants0. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. Nonparticipants, $n = 43$; WS-participants, $n = 43$.

References

1. Bernd, K.; Carlo, J.C.; Jäger, J. Citizen participation in sustainability assessments. In *Public Participation in Sustainability Science: A Handbook*; Kasemir, B., Jäger, J., Jaeger, C.C., Gardner, M.T., Eds.; Cambridge University Press: Cambridge, UK, 2003; pp. 3–36; ISBN 0521818184.
2. Gough, C.; Darier, É.; De Marchi, B.; Funtowicz, S.; Grove-White, R.; Pereira, Â.G.; Shackley, S.; Wynne, B. Contexts of citizen participation. In *Public Participation in Sustainability Science: A Handbook*; Cambridge University Press: Cambridge, UK, 2003; pp. 37–61; ISBN 0521818184.
3. Devine-Wright, P. Place attachment and public acceptance of renewable energy: A tidal energy case study. *J. Environ. Psychol.* **2011**, *31*, 336–343. [[CrossRef](#)]
4. Gärling, T.; Steg, L. *Threats from Car Traffic to the Quality of Urban Life: Problems, Causes, and Solutions*; Gärling, T., Steg, L., Eds.; Elsevier: Amsterdam, The Netherlands, 2007; ISBN 9780080448534.
5. Schuitema, G.; Bergstad, C.J. Acceptability of Environmental Policies. In *Environmental Psychology: An Introduction*; Steg, L., van den Berg, A.E., de Groot, J.I.M., Eds.; Wiley-Blackwell: Chichester, UK, 2013; pp. 255–266; ISBN 978-1-119-24107-2.
6. Steg, L.; Dreijerink, L.; Abrahamse, W. Factors influencing the acceptability of energy policies: A test of VBN theory. *J. Environ. Psychol.* **2005**, *25*, 415–425. [[CrossRef](#)]
7. Liebe, U.; Dobers, G.M. Decomposing public support for energy policy: What drives acceptance of and intentions to protest against renewable energy expansion in Germany? *Energy Res. Soc. Sci.* **2019**, *47*, 247–260. [[CrossRef](#)]
8. Sonnberger, M.; Ruddat, M. Local and socio-political acceptance of wind farms in Germany. *Technol. Soc.* **2017**, *51*, 56–65. [[CrossRef](#)]
9. Hall, N.; Ashworth, P.; Devine-Wright, P. Societal acceptance of wind farms: Analysis of four common themes across Australian case studies. *Energy Policy* **2013**, *58*, 200–208. [[CrossRef](#)]
10. Whitton, J.; Brasier, K.; Charnley-Parry, I.; Cotton, M. Shale gas governance in the United Kingdom and the United States: Opportunities for public participation and the implications for social justice. *Energy Res. Soc. Sci.* **2017**, *26*, 11–22. [[CrossRef](#)]
11. Smith, P.D.; McDonough, M.H. Beyond public participation: Fairness in natural resource decision making. *Soc. Nat. Resour.* **2001**, *14*, 239–249. [[CrossRef](#)]
12. Bouzguenda, I.; Alalouch, C.; Fava, N. Towards smart sustainable cities: A review of the role digital citizen participation could play in advancing social sustainability. *Sustain. Cities Soc.* **2019**, *50*, 101627. [[CrossRef](#)]
13. Besley, J.C. Public engagement and the impact of fairness perceptions on decision favorability and acceptance. *Sci. Commun.* **2010**, *32*, 256–280. [[CrossRef](#)]
14. Gross, C. Community perspectives of wind energy in Australia: The application of a justice and community fairness framework to increase social acceptance. *Energy Policy* **2007**, *35*, 2727–2736. [[CrossRef](#)]
15. Sheppard, B.H.; Lewicki, R.J. Toward General Principles of Managerial Fairness. *Soc. Justice Res.* **1987**, *1*, 161–176. [[CrossRef](#)]
16. Glucker, A.N.; Driessen, P.P.J.; Kolhoff, A.; Runhaar, H.A.C. Public participation in environmental impact assessment: Why, who and how? *Environ. Impact Assess. Rev.* **2013**, *43*, 104–111. [[CrossRef](#)]
17. Dietz, T.; Stern, P.C. *Public Participation in Environmental Assessment and Decision Making*; National Academies Press: Washington, DC, USA, 2008; ISBN 9780309123983.
18. Cohen-Charash, Y.; Spector, P.E. The role of justice in organizations: A meta-analysis. *Organ. Behav. Hum. Decis. Process.* **2001**, *86*, 278–321. [[CrossRef](#)]
19. Smith, G. *Deliberative Democracy and the Environment*; Routledge: London, UK, 2003; ISBN 9780415309400.
20. Dahl, R.A. *Democracy and Its Critics*; Yale University Press: New Haven, CT, USA, 1989; ISBN 9780300049381.
21. Weymouth, R.; Hartz-Karp, J.; Marinova, D. Repairing political trust for practical sustainability. *Sustainability* **2020**, *12*, 7055. [[CrossRef](#)]
22. Crosby, N. Citizens juries: One solution for difficult environmental questions. In *Fairness and Competence in Citizen Participation*; Renn, O., Webler, T., Wiedemann, P., Eds.; Kluwer Academic Publishers: Dordrecht, The Netherlands, 1995; pp. 157–174; ISBN 978-0-7923-3517-7.
23. Diemel, P.C.; Renn, O. Planning cells: A gate to “fractal” mediation. In *Fairness and Competence in Citizen Participation*; Renn, O., Webler, T., Wiedemann, P., Eds.; Kluwer Academic Publishers: Dordrecht, The Netherlands, 1995; pp. 117–140; ISBN 978-0-7923-3517-7.
24. Fishkin, J.S.; Luskin, R.C. Experimenting with a democratic ideal: Deliberative polling and public opinion. *Acta Polit.* **2005**, *40*, 284–298. [[CrossRef](#)]
25. Fishkin, J.S. When the People Speak—Deliberative Democracy and Public Consultation—Oxford Scholarship Online Users without a Subscription Are Not Able to See the Full Content. In *Worldcat When the People Speak: Deliberative Democracy and Public Consultation*; Oxford University Press (OUP): Oxford, UK, 2011; ISBN 9780199604432.
26. Mikami, N. Trends in democratic innovation in Asia. In *Handbook of Democratic Innovation and Governance*; Elstub, S., Escobar, O., Eds.; Edward Elgar Publishing: Northampton, MA, USA, 2019; pp. 421–434; ISBN 978 1 78643 386 2.
27. Renn, O.; Blättel-Mink, B.; Kastenzholz, H. Discursive methods in environmental decision making. *Bus. Strategy Environ.* **1997**, *6*, 218–231. [[CrossRef](#)]
28. Renn, O.; Webler, T.; Rakel, H.; Diemel, P.C.; Johnson, B. Public participation in decision making: A three-step procedure. *Policy Sci.* **1993**, *26*, 189–214. [[CrossRef](#)]

29. Ohnuma, S. Citizen participation and procedural fairness in a policy for reduction of household wastes: Process design from planning to implementation in Sapporo. In *How Environmental Conservation Succeeds?: How to Proceed "Adaptive Governance" on the Fields*; Miyauchi, T., Ed.; Shinsensha: Tokyo, Japan, 2017; pp. 30–58; ISBN 9784787717076.
30. Abelson, J.; Forest, P.-G.; Eyles, J.; Smith, P.; Martin, E.; Gauvin, F.-P. Deliberations about deliberative methods: Issues in the design and evaluation of public participation processes. *Soc. Sci. Med.* **2003**, *57*, 239–251. [[CrossRef](#)]
31. Hirose, Y. A normative and empirical research on procedural justice of citizen participation in environmental management planning. In *Social Justice in Japan: Concepts, Theories and Paradigms*; Ohbuchi, K., Ed.; Trans Pacific Press: Melbourne, Australia, 2007; pp. 264–290. ISBN 1876843780/9781876843786.
32. Ohnuma, S.; Hirose, Y.; Sugiura, J. Acceptance of a compromised decision beyond dichotomy and procedural fairness as its determinants: A case study of tram in Neuss. *J. Soc. Saf. Sci.* **2019**, *9*, 89–101.
33. Webler, T. "Right" discourse in citizen participation: An evaluative yardstick. In *Fairness and Competence in Citizen Participation*; Kluwer Academic Publishers: Dordrecht, The Netherlands, 1995; pp. 35–86; ISBN 978-0-7923-3517-7.
34. Van Den Bos, K. What Are We Talking about When We Talk about No-Voice Procedures? On the Psychology of the Fair Outcome Effect. *J. Exp. Soc. Psychol.* **1999**, *35*, 560–577. [[CrossRef](#)]
35. Thibaut, J.W.; Walker, L.; Hillsdale, N.J. *Procedural Justice: A Psychological Analysis*; Lawrence Erlbaum: Hillsdale, NJ, USA, 1975; ISBN 978-0470858684.
36. Nonami, H.; Hirose, Y.; Ohnuma, S.; Midden, C.J.H.; Ohtomo, S. Effects of voice and similarity on procedural fairness and trust: A dual process model of public acceptance based on representatives' participation. *Asian J. Soc. Psychol.* **2015**, *18*, 216–224. [[CrossRef](#)]
37. Leventhal, G.S. What should be done with equity theory? New approaches to the study of fairness in social relationship. In *Social Exchange*; Gergen, K.J., Greenberg, M.S., Willis, R.H., Eds.; Plenum: New York, NY, USA, 1980; pp. 27–55.
38. Dienel, P.C. Contributing to social decision methodology: Citizen reports on technological projects. In *Social Decision Methodology for Technological Projects*; Vlek, C.A., Cvetkovich, G., Eds.; Kluwer Academic Publishers: Dordrecht, The Netherlands, 1989; pp. 133–151; ISBN 978-0-7923-0371-8.
39. Nikolakis, W. Participatory backcasting: Building pathways towards reconciliation? *Futures* **2020**, *122*, 102603. [[CrossRef](#)]
40. Holmberg, J.; Robert, K.-H. Backcasting—a framework for strategic planning. *Int. J. Sustain. Dev. World Ecol.* **2000**, *7*, 291–308. [[CrossRef](#)]
41. Robinson, J.B. Energy backcasting A proposed method of policy analysis. *Energy Policy* **1982**, *10*, 337–344. [[CrossRef](#)]
42. Soria-Lara, J.A.; Banister, D. Dynamic participation processes for policy packaging in transport backcasting studies. *Transp. Policy* **2017**, *58*, 19–30. [[CrossRef](#)]
43. Tuominen, A.; Tapio, P.; Varho, V.; Järvi, T.; Banister, D. Pluralistic backcasting: Integrating multiple visions with policy packages for transport climate policy. *Futures* **2014**, *60*, 41–58. [[CrossRef](#)]
44. Lind, A.E.; Tyler, T.R. *The Social Psychology of Procedural Justice*; Plenum Press: New York, NY, USA, 1988; ISBN 978-0-306-42726-8.
45. Törnblom, K.; Vermunt, R. *Distributive and Procedural Justice: Research and Social Applications*; Ashgate: Hampshire, UK, 2007; ISBN 978-0754647669.
46. Tyler, T.R.; Degoey, P. Collective restraint in social dilemmas: Procedural justice and social identification effects on support for authorities. *J. Pers. Soc. Psychol.* **1995**, *69*, 482–497. [[CrossRef](#)]
47. Deutsch, M. Equity, Equity, equality, and need: What determines which value will be used as the basis of distributive justice? *J. Soc. Issues* **1975**, *31*, 137–149. [[CrossRef](#)]
48. Deutsch, M. *Distributive Justice: A Social-Psychological Perspective*; Yale University Press: New Haven, CT, USA, 1985; ISBN 0300032900.
49. Esaiasson, P.; Persson, M.; Gilljam, M.; Lindholm, T. Reconsidering the role of procedures for decision acceptance. *Br. J. Polit. Sci.* **2019**, *49*, 291–314. [[CrossRef](#)]
50. Krütli, P.; Stauffacher, M.; Pedolin, D.; Moser, C.; Scholz, R.W. The process matters: Fairness in repository siting for nuclear waste. *Soc. Justice Res.* **2012**, *25*, 79–101. [[CrossRef](#)]
51. Daly, J.P. Explaining changes to employees: The influence of justifications and change outcomes on employees' fairness judgments. *J. Appl. Behav. Sci.* **1995**, *31*, 415–428. [[CrossRef](#)]
52. Smith, H.J.; Tyler, T.R. Justice and power: When will justice concerns encourage the advantaged to support policies which redistribute economic resources and the disadvantaged to willingly obey the law? *Eur. J. Soc. Psychol.* **1996**, *26*, 171–200. [[CrossRef](#)]
53. Tyler, T.R. Using procedures to justify outcomes: Testing the viability of a procedural justice strategy for managing conflict and allocating resources in work organizations. *Basic Appl. Soc. Psychol.* **1991**, *12*, 259–279. [[CrossRef](#)]
54. Ohnuma, S.; Hirose, Y.; Karasawa, K.; Yorifuji, K.; Sugiura, J. Why do residents accept a demanding rule?: Fairness and social benefit as determinants of approval of a recycling system. *Jpn. Psychol. Res.* **2005**, *47*, 1–11. [[CrossRef](#)]
55. Ruder, A.I.; Woods, N.D. Procedural fairness and the legitimacy of agency rulemaking. *J. Public Adm. Res. Theory* **2020**, *30*, 400–414. [[CrossRef](#)]
56. Herian, M.N.; Hamm, J.A.; Tomkins, A.J.; Pytlik Zillig, L.M. Public participation, procedural Fairness, and evaluations of local governance: The moderating role of uncertainty. *J. Public Adm. Res. Theory* **2012**, *22*, 815–840. [[CrossRef](#)]
57. Illsley, B.M. Fair participation—A canadian perspective. *Land Use Policy* **2003**, *20*, 265–273. [[CrossRef](#)]

-
58. Maija, J. Participatory innovations and maxi-publics: The influence of participation possibilities on perceived legitimacy at the local level in Finland. *Eur. J. Polit. Res.* **2019**, *58*, 603–630. [[CrossRef](#)]
 59. Liu, L.; Bouman, T.; Perlaviciute, G.; Steg, L. Public participation in decision making, perceived procedural fairness and public acceptability of renewable energy projects. *Energy Clim. Chang.* **2020**, *1*, 100013. [[CrossRef](#)]