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Public preferences for distribution in the context of transport investments

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ABSTRACT

In this paper, we present a study of Swedish inhabitants' preferences for distribution in three dimensions in the context of transport investments. Using choice experiments, we study the respondents' preferences for the distribution of benefits in the geographical, gender, and income dimension in relation to aggregate benefits. We find that they have quite strong preferences for equality in all dimensions, especially in the gender dimension. Additionally, when distribution is unequal, respondents tend to prefer that it is uneven in favour of non-metropolitan regions, women and low-income earners. We also find that variables describing self-interest, some general beliefs and the extent to which respondents consider the Swedish society to be fair may explain some preference heterogeneity.

1. Introduction

The transport economics literature on the allocation of transport investment allocation has largely focused on the use of cost–benefit analyses by politicians and government agencies (e.g., McFadden, 1975, 1976; Nilsson, 1991; Nellthorp and Mackie, 2000; Odeck, 2010; Eliasson and Lundberg, 2012; Mouter et al., 2013; Annema et al., 2017). Some of these studies have also examined whether there are any apparent distributional considerations affecting such decisions. For instance, Bondemark et al. (2020) explored which distributional considerations guided the Swedish Transport Administration in preparing the National Transport Plan 2018–2029. The only distributional consideration appears to have been that each of Sweden's 21 regions should get at least one project. Other explanatory variables – such as regional economic growth, unemployment or population – did not explain investment allocation.

In their study of how politicians and government agencies in both Norway and Sweden allocate transport investments Eliasson et al. (2015) found that the only factor influencing the allocation of Norwegian investment is support among the local electorate. They argue that this implies that voters care more about self-interest and the regional distribution of benefits than cost efficiency. There are also other studies that incorporate political deliberations in infrastructure allocation. Castells and Solé-Ollé (2005), Cadot et al. (2006) and Jussila Hammes and Nilsson (2016) all report that the prospect of gaining political power by rewarding certain regions with public investment appear to explain infrastructure allocation. Additionally, Jussila Hammes and Nilsson (2016) and Halse (2016) report that

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the district demand for infrastructure is influenced by the degree to which the district contribute to the funding.

However, the question of which distributional impacts of transport policy the public consider desirable remains largely unanswered. One notable exception is the study by Mouter et al. (2017a), which empirically investigates citizens' preferences for the spatial distribution of benefits accruing from transport investments. The issue of which distributional consequences the public deem acceptable has, however, been addressed in studies of the acceptance of and willingness to pay tax. Most of the evidence presented in the literature on the acceptance of transport related taxes deals with Pigouvian taxes, often finding that the distributional impact and perceived fairness of the tax are more important for the acceptance than self-interest (Kallbekken and Sælen, 2011; Eliasson and Jonsson, 2011; Börjesson et al., 2015), even though studies of congestion charges show that self-interest is important when explaining public support (Winslott-Hiselius et al., 2009; Baranzini et al., 2021). Kallbekken et al. (2013) also find that undesirable distributional impacts are the primary factor explaining the low acceptance of taxes in the transport sector. Pizer and Sexton (2018) also highlight that the regressivity of many corrective taxes could be an important factor when explaining the low level of public acceptance. Given that political preferences are often correlated with self-interest, it can be complicated to study how such preferences explain policy acceptance (Funk, 2000; Gerber et al., 2017). That said, in his study of acceptance of congestion charges, Eliasson (2016) finds that citizen and consumer components of utility are not necessarily highly correlated. There are theories that attempts to explain why some outcomes are deemed fair and some that describes how self-interest shape social preferences. Two of these, *the belief in a just world* (Rubin and Peplau, 1973) and *the prospect of upward mobility* (Alesina and La Ferrara, 2005), are used in the paper.

In this paper, we aim to combine concepts from studies on investment allocation and tax acceptance by studying the preferences of a sample of the Swedish public with regard to transport policy in relation to the stated overarching goal for the Swedish Government's transport and infrastructure policy: "*ensuring the provision of economically efficient, sustainable transport services for the general public and businesses throughout the country*" (Government Offices of Sweden, 2021), specifically the allocation of benefits from transport investments. Our objectives are twofold:

(I) To study how a sample of the Swedish public choose between transport policies that differ with regards to aggregate social benefit and prominent distributional dimensions deduced from the overarching goal for Swedish transport policy (geography, gender, and income).
(II) To examine whether preferences for these policy aspects depend on characteristics describing self-interest, general beliefs, as well as beliefs linked to two specific concepts: *the belief in a just world* and *the prospect of upward mobility*.

We do so by expanding on Mouter et al. (2017a) and conducting a choice experiment with three sub-experiments.

In Section 2, we describe theories explaining what shapes distributional preferences. In Section 3, we present the survey, in Section 4, the methods used and in Sections 5 the results. We end the paper with Sections 6 and 7, which contain discussion and conclusions respectively.

2. Background

2.1. Explaining distributional preferences

A demand for a particular distributional profile may be the result of various factors. As the studies on tax acceptance mentioned in the introduction have shown, self-interest and the perceived fairness of distribution are important factors when individuals decide whether a given distribution is desirable. However, self-interest and perceived fairness are not necessarily mutually exclusive. There is also substantial variation in what people perceive as fair and what motivates our perception. While people might, for example, care for their family or those less well-off than themselves, there are also shared societal norms that influence our perception of fairness (Elster, 2006; Bartling and Schmidt, 2016).

Preferences regarding distribution vary with the good being distributed and the groups or individuals among whom it is distributed. While there is a case to be made that it is pointless to study distribution among groups since the individuals within any group are unique, we often discuss the distribution of resources between groups as a practical way to simplify a complex world in both policy and everyday life, even if we lose information in the process (Rae, 1981).

In a functioning democracy, policies might also be expected to reflect voter perceptions of what is fair. There is also evidence to suggest that people are influenced by the society in which they live (Alesina and Fuchs-Schündeln, 2007), in as much as people conform to societal norms. This conformity could be interpreted as a preference for the status quo. In another paper, Alesina and Angeletos (2005) show that historical income inequality gives rise to a demand for redistribution. They argue that redistributive policies are more extensive in Europe than in the United States as a result of historical income and class inequities in Europe. Given these results and the economic redistribution policies in Sweden, we would expect the Swedish public to have a relatively high baseline demand for equality and redistribution in favour of groups perceived as less well-off.

Aside from the more general conclusions above, there are many explanations for what shapes demand for redistribution among individuals and groups. Below we will give a brief account of some of the more influential theories. It is worth noting that these explanations are not mutually exclusive.

2.2. Self-interest and the prospect of upward mobility

Perhaps the most obvious reason for someone to demand redistribution of resources is self-interest, i.e., that they stand to gain from

it. A specific case of self-interest is the *prospect of upward mobility* (POUM), which states that individuals who believe that they will be better off tomorrow will oppose progressive redistribution policies today so that they will not be affected negatively by them in the future (Alesina and La Ferrara, 2005). Conversely, people may demand greater redistribution today if they think that there is a risk that they will be worse off tomorrow (Benabou and Ok, 2001). Cusack et al. (2006) and Rehm (2009) study how the risk of unemployment explains the demand for redistribution and find a correlation between a larger risk of unemployment and a greater demand for redistribution – findings in line with POUM.

2.3. Social preferences and the belief in a just world

Social or political preferences relate to how society should be structured and how it should deal with everyday problems, such as the distribution of resources. Using social preferences to explain distributional considerations is complicated since social preferences can include just about anything and are difficult to disentangle from self-interest. Various studies (e.g., Fong, 2001; Alesina and Giuliano, 2011) have explored how different cultural markers such as religion relate to the demand for redistribution. These studies find that variations in the demand for redistribution among individuals can be explained by cultural factors such as religion and the norms of the society in which one lives (Alesina and Fuchs-Schündeln, 2007).

Belief about what determines success can also explain the demand for redistribution. Fong (2001) finds that individuals who believe that financial success is determined by factors beyond their control, such as who their parents are and their ethnicity, will demand greater redistribution. Conversely, an individual who believes that society offers equal opportunities, and that success is a matter of self-determination – achieved through hard work, for example – will be less inclined to demand redistribution, as shown in the papers by Alesina and La Ferrara (2005) and Karadja et al. (2017). This relationship is referred to as *the belief in a just world*. It was first identified by Rubin and Peplau (1973), who found that those who believe in a just world showed less sympathy for others. Bénabou and Tirole (2006) have used the theory to explain differences in redistributive policies in Europe and the US.

2.4. Soliciting citizen preferences

Ideally, we would like to solicit citizen preferences through the political system. In some cases, the political system offers opportunities to study citizen preferences for transport policy in a Swedish context, notably the referendums on the Stockholm congestion charge (Winslott-Hiselius et al., 2009; Börjesson et al., 2012) and the referendum on the Gothenburg congestion charge (Börjesson et al., 2016; Hansla et al., 2017). However, as was the case with the Gothenburg referendum, using referendums to solicit preferences is not without its problems[1].

In the absence of a referendum, we could interpret the political system's output (Eliasson and Lundberg, 2012; Eliasson et al., 2015) as indicative of the preferences of citizens as regards the distribution of resources in the transport sector. This view is perhaps idealistic: voter behaviour is also influenced by the trustworthiness, charisma and other character traits exhibited by politicians (Costa and da Silva, 2015). Perhaps more importantly, since transport is only one of many policy areas, and arguably not the most important, citizens do not necessarily vote for transport policy but to some extent get the transport policy they are given. There are of course exceptions, such as single-issue parties opposing or promoting specific policies, for example, Gothenburg's *Vägvalet* [Crossroads], which was established to oppose the city's congestion charge. To inform policymakers and civil servants of public preferences for the distribution of transport investments, we would like to directly study the public's preferences without the filter of the political system. Stated preference methods allow us to do just that.

Stated preference (SP) methods are widely used, not only in the transport sector for soliciting information such as the willingness to pay (WTP) for the value of time (Wardman et al., 2016), traffic safety improvements (Lindhjelm et al., 2011) and alleviating environmental impacts such as noise (Bristow et al., 2015), but also in other areas such as the environment, agriculture and health (Mahieu et al., 2017). Traditionally, SP methods solicit preferences from a consumer perspective; however, there have also been papers aimed at soliciting citizen preferences. Some recent contributions to the transport literature that make this distinction are (Mouter and Chorus, 2016), Mouter et al. (2017a), and Mouter et al. (2017b), which study the value of time, the spatial distribution of traffic safety, journey time savings and the trade-off between the value of time and traffic safety.

There are various ways to make the distinction between consumer and citizen preferences. In Mouter et al. (2017b), the authors discuss three different ways to do so. The first is that citizen preferences are consumer preferences with altruism. The second is the distinction between *homo economicus* and *homo politicus*, where the former considers the consequences for themselves and the latter the consequences for society (Nyborg 2000). Nyborg (2000) appears optimistic about the possibility of soliciting answers as either *homo economicus* or *homo politicus* by using contextual clues and framing. Both these approaches hinge on framing the choices and stressing that the respondents should base their responses on societal considerations. Some studies, such as Ovaskainen and Kniivila (2005), identify major differences between consumer and citizen preferences in the valuation of conservation areas in eastern Finland. Other studies, such as Howley et al. (2010), identify minor differences between consumer and citizen preferences for preserving the traditional rural landscape of Ireland. These differences suggest that framing could be an unreliable method for differentiating between consumer and citizen preferences.

There are several other problems with both of these approaches. One issue discussed by Mouter et al. (2017b) is that it is difficult, if

[1] The congestion charge was associated with the unpopular West-Link infrastructure project and the referendum was therefore viewed by many voters as a referendum on the infrastructure project.

Table 1
Descriptive statics, definitions and underlying hypotheses of variables used to explain preference heterogeneity.

Variable	Definition	Hypotheses	Mean
Self-interest			
Female	1 if the respondent is female, 0 if not.	Respondents want a larger share of benefits accruing to their gender.	0.49
Relatively low income (a)[A]	1 if the respondent believes that he/she has an income below the average Swedish income[B], 0 if not.	Respondents who believe that they have a low income want a larger share of benefits accruing to the respondent with low income than those who do not believe they have a low income.	0.47
Living in a metropolitan region (a)	1 if the respondent lives in one of the three metropolitan regions in Sweden, 0 if not.	Respondents who live in a metropolitan region want a smaller share of benefits accruing to other regions than those who live in other regions.	0.48
Beliefs tied to specific theories			
Belief in a just world (geographical) (a)	1 if the respondent agrees that where people grow up does not their impact opportunities, 0 if not.	A respondent with a firm belief in a just world geographically will demand less redistribution in that dimension.	0.42
Belief in a just world (gender) (a)	1 if the respondent agrees that whether someone is a woman or man does not impact their opportunities in Sweden, 0 if not.	A respondent with a firm belief in a just world from a gender equality perspective will demand less redistribution in that dimension.	0.45
Belief in a just world (income)	1 if the respondent agrees that effort is very important and background is not for income success in Sweden, 0 if not.	A respondent with a firm belief in a just world from an income perspective will demand less redistribution in that dimension.	0.44
Prospect of upward mobility (a)	1 if the respondent believes that he/she will belong to a higher class in 10 years, 0 if not.	Those who believe that they will belong to a higher class will demand less redistribution in the income dimension, than those who do not.	0.13
General beliefs			
Big government (a)*	1 if the respondent agrees or is indifferent towards if it is the government's responsibility to provide nine different public services/activities, 0 if not.	Those who demand a big government will also have a greater demand for redistribution.	0.54
Live in all of Sweden	1 if the respondent strongly agrees that it is important that people can live in all of Sweden, 0 if not.	Respondents who think it is important that people can live in all of Sweden will have a higher demand for geographical redistribution than those who do not.	0.62
Smaller gap between rich and poor	1 if the respondent agrees that it is the government responsibility to reduce the differences between the rich and the poor, 0 if not.	Those who want a smaller gap between rich and poor will have a higher demand for redistribution in the income dimension than those who do not.	0.45
Charity (a)[C]	1 if the respondent donates to charity, 0 if not.	Those who donate to charity are more altruistic than those who do not, prompting them to demand more redistribution.	0.51
Left-leaning (a)	1 if the respondent stated that he/she liked any of the three left-leaning parties (Social democrats, Green party, or Left party) most of the parties in parliament, 0 if not.	Those sympathising with left-wing parties will demand more redistribution than those who do not.	0.36

[A] (a)Denotes if the variable is also absolute. In all variables we have strived for an even split of the sample, if for example half the sample agree with a statement the variable is also absolute and is then denoted (a).

[B] Note that we used average rather than median in order to make it easier for the respondents to understand. This implies that more than half of the population have an income below the national average.

[*] An alternative definition, *1 if the respondent wants to increase or maintain public expenditure in eight different policy areas, 0 if not,* was tested but did not provide any different results from the definition used. In the interest of saving space, we only present the results of the definition used.

[C] Charitable donations have been used as an indicator of altruism by, for example, Gärtner et al. (2017) and Khalil (2004) defines altruism as charity.

not impossible, to distinguish between consumer and citizen preferences given that we cannot know with any certainty in which guise the respondents have answered. Borrowing from Miniard and Cohen's (1981) critique of the theory of planned behaviour, there is a point to be made that it is impossible to tell, and irrelevant, whether someone's behaviour is genuinely altruistic or if they simply wish to avoid the discomfort (for example remarks from friends) of not acting in a manner perceived as altruistic. People may have self-serving preferences that align with their view of fairness, or they may perceive self-serving preferences to be entirely fair, as exemplified by the hypotheses of the belief in a just world and POUM respectively. Pocketbook voting provide evidence that citizen preferences can be self-serving, even in Sweden (Elinder et al., 2015).

The third way to differentiate between consumer and citizen preferences is to define them based on budget or payment vehicle. Choices made based on personal budgetary constraints (income, for example) reflect consumer preferences, while choices made based on public budgetary constraints (i.e. public funds) reflect citizen preferences. This distinction is used by Gyrd-Hansen (2013), Mouter & Chorus (2016), and Mouter et al. (2017a, 2017b). In our instructions to the respondents, we stress that choices should be made based on the public-sector budget but that their choices will not affect the level of taxation. We therefore define citizen preferences in the same way as Gyrd-Hansen (2013), Mouter & Chorus (2016) and Mouter et al. (2017a, 2017b). However, we also devote a great deal of effort to framing the choices in a manner consistent with Nyborg's (2000) definition of citizen preferences.

3. Survey

In this section, we describe the survey we conducted to collect the data used in the analysis. In the first section, we describe how the

survey was designed, in the second section we present the experiments. In the third section we describe the data collection.

3.1. Survey design

Initially, the background questions were drafted, and D(B)-error efficient experimental designs, were generated using the idefix package in R (Traets & Gil 2020) and parameter estimates from Mouter et al. (2017a). D(B)-error efficient designs maximises the information gathered from the questions, which enables us to estimate parameter with as high precision as possible for a given sample size (Devarasetty et al., 2012). The designs were tested on synthetic populations simulated in Excel. The survey then underwent several focus groups consisting of PhD candidates with no experience of choice experiments as well as a group of young adults with university education[2] to evaluate the realism and comprehensibility of the survey. The focus groups prompted adjustments to the survey, primarily simplifications to the experiments, explanatory texts as well as shortening the survey. Once we had what we considered to be a fit-for-purpose questionnaire, the survey was submitted to the Swedish Ethical Review Authority.[3] Following some minor adjustments to the survey, ethical approval was granted. We then conducted a pilot survey using a web panel consisting of 202 members of the public. Using the data collected in the pilot survey, we estimated parameters with the expected signs using a basic model specification. We then proceeded to the main study.

The survey consisted of four sections. The first section contained the introductory letter describing the purpose of the study, their rights as survey participants as well as information about the importance of their answers. The second section served two purposes: (1) to prepare respondents for transport-related questions by asking questions about their own travel habits, and (2) to frame the experiments in such a way as to elicit citizen preferences by asking questions about parts of the public budget, since we define citizen preferences as choices made using the public-sector budget. The third section contained the experiments themselves, which will be described in detail in the next section. The fourth section contained background questions.

The many background questions in the survey were designed with ex-ante hypotheses on how they explain preference heterogeneity in mind, in line with the recommendations on auxiliary questions in Johnston et al. (2017). Table 1 presents variables used for segmentation along with how they are defined and which hypothesis they correspond to. These variables are constructed from the background questions. Reasonable dichotomies were created from the raw responses with the aim of achieving as close as possible to a 50–50 split between the groups. The variables are therefore relative. If the variables are not only relative but also absolute, the variable describing this is therefore denoted (*a*). For example, since half the sample state that they live in one of Sweden's three metropolitan regions they do not only live in a relatively more metropolitan region but also in a metropolitan region in absolute terms and are therefore denoted (*a*). The variables are used as proxies for the three categories of explanatory factors: *self-interest, beliefs tied to specific theories* and *general beliefs*.[4] Most questions, apart from questions such as gender, were answered on a 7-point Likert-scale. Questions regarding beliefs were posed on the form *To what extent do you agree that….?*, and answered on a likewise 7-point scale from *Completely disagree* to *Completely agree*.

In some cases, the hypotheses refer to the demand for redistribution of resources. In this case, we assume that the beneficiaries of redistribution are those living outside the metropolitan regions, women and those lower-than-average income. A demand for redistribution is therefore viewed as synonymous with having a stronger preference for unequal distribution that favours these groups. We also ran models with interactions between basic variables – i.e., age, income, education, and gender – and all the attributes in the experiments. Since the only consistently significant variables were the ones connected to self-interest, we have not included any of the other variables in the experiments.

3.2. Experiment design

In the choice experiments, the respondents were asked which of two infrastructure packages they preferred. The packages differed both in terms of the total amount of benefits and the distribution of these benefits. Each experiment contained information about two distributional dimensions. Initially, the survey included much more complicated choices with different types of benefits (journey time savings, traffic safety improvements, reduced emissions, etc.) to reflect the differences in distributional preferences with regards to the item of distribution (Mouter et al., 2017a). However, focus groups revealed that this made the experiments too complicated for the respondents to grasp, and they resorted to lexicographic responses. In turn, these lexicographic responses resulted in parameter estimates that correspond to unrealistic preferences, specifically an extremely high willingness to pay (in terms of foregoing benefits) for emission reductions. Because of this, we opted for a design that focused on the distributional dimensions and described the benefits in one variable.

The variable describing the total amount of benefits we opted for was *the net benefits divided by the costs* phrased as *societal surplus per invested SEK*. This leaves the type of benefits open to interpretation by the respondent; however, as the purpose of this survey is not to

[2] Attempts were also made to recruit undergraduates, unfortunately interest was low.

[3] Case number 2019-06461.

[4] Correlations between variables are presented in Appendix 3 – Correlation Matrix. In general, the correlation between variables is low; the only exception is that between the variables describing belief in a just world in the geographical and gender dimension.

Alternative A		
Societal surplus per SEK	0.4	
Geographical distribution	**Metropolitan regions**	**Other regions**
Share of positive effects accruing to respective region	70%	30%
Gender distribution	**Women**	**Men**
Share of positive effects accruing to women and men respectively	50%	50%

Alternative B		
Societal surplus per SEK	0.1	
Geographical distribution	**Metropolitan regions**	**Other regions**
Share of positive effects accruing to respective region	40%	60%
Gender distribution	**Women**	**Men**
Share of positive effects accruing to women and men respectively	40%	60%

Previous Question Next Question

Fig. 1. Choice situation.

solicit the WTP for different types of benefits but primarily to study how respondents make distributional trade-offs, we consider this justified. Additionally, as the cost is the same for both alternatives in all choices, the variable is synonymous with the aggregate benefits and we will therefore refer to it as such in the text to make interpretation easier.[5]

The presentation of the choice sets is depicted in Fig. 1, where an alternative is selected by clicking on it and then a button that takes the respondent to the next question. A more detailed description of the presentation of the questions is available in Appendix 1 – Choice Situations. The alternatives were oriented in this vertical fashion since a large proportion of respondents answer the survey on their smartphones.[6]

The distributional dimensions included in the experiments were chosen based on their prominence in Swedish policy debate. They were *geographical, gender,* and *income*. The distributional profile of each of these dimensions was presented to the respondent as the share of benefits accruing to each group in that dimension. For example, if 70 per cent of the benefits accrue to women, 30 per cent accrue to men. Even though the groups chosen in these dimensions contain very different individuals, we choose them as these are the groups used in the policy debate.

In the geographical dimension, we divided Sweden into two areas of roughly equal population, one containing the three metropolitan regions around the three largest cities[7] (5.5 million people) and the other one the remaining regions (4.9 million people). The respondents were then given information about the share of the benefits accruing to individuals in each region. The gender dimension described the share of the benefits accrued to women and men respectively. The income distribution described how large a share of benefits accrued to individuals with incomes below and above the average national income.[8] The levels of the attributes were chosen to

[5] It is fair to assume that the aggregate benefit attribute is more difficult to interpret than the measures used by Mouter et al. (2017a), i.e., journey time per person and day and number of deaths avoided per year. As such, we devoted a great deal of effort to describing the attribute in a manner that made it easy to understand.

[6] Antoun et al. (2017) have shown that respondents provide equally good answers on smartphones as they do when using a PC.

[7] Stockholm, Västra Götaland (Gothenburg) and Skåne (Malmö).

[8] We opted for average income instead of median as we reckoned that this would be easier for the respondents to understand.

Table 2
Attributes used in the experiments.

Attribute	Levels	Experiment			Description in the survey
		1	2	3	
Societal surplus per SEK (aggregate benefits)	0.0/0.1/0.2/ 0.3/0.4/0.5	X	X	X	Imagine all the positive and negative effects of the packages can be translated into money. These can then be compared with the cost to describe the societal surplus per invested SEK.If the societal surplus per invested SEK is 0.5, that means that the positive effects as a result of the investment correspond to 1.5 SEK, which results in a profit of 0.5 SEK.A higher societal surplus per invested SEK means more positive effects per invested SEK.
Geographical distribution	30%/40%/ 50%/60%/70%	X	X		There are about as many people living in each region.We will describe how large share of the positive effects that accrue to inhabitants in each region.
Gender distribution	40 %45%/50%/ 55%/60%	X		X	Describes how large share of the positive effects that accrue to women and men, respectively.
Income distribution	30%/40%/ 50%/60%/70%		X	X	Describes how large share of the positive effects that accrue to those who make below and above the mean income in Sweden, respectively.

maintain realism while also produce large enough variation in the data. The levels of the attributes and which attributes were present in each experiment are presented in Table 2.[9]

3.3. Data collection

The data for the main study was collected between 5 June and 6 July 2020 from a web panel by the survey company the Origo Group,[10] using panels to which people are unable to self-recruit. Our sample differs from the Swedish population in general in that it has a higher average age, higher than average level of education and higher than average income. In total, 2169 online surveys were completed by respondents between the ages of 18 and 75. Sixty-one responses were discarded due to irregularities in the answers,[11] yielding a total of 2108 useful responses. Each respondent made three choices for each of the three experiments (the survey contained a fourth, slightly different, experiment which is not presented in this paper) out of a pool of 18 possible choices for each experiment. With regards to how the mode of collection (the internet) might have impacted answer quality, several studies have shown that there is no difference between online surveys and face-to-face or postal surveys (e.g., Lindhjem and Navrud, 2011; Determann et al., 2017; Ryan et al., 2019; Cernat and Revilla, 2020).

When collecting the data, we used four different variants of the survey. Two of the survey versions contained a practice example of a choice task, while two did not. Although examples may enhance the understanding of the choice task, this might also bias the results. To minimise bias, we constructed the example so that the two options were as realistic as possible (Meyerhoff and Glenk, 2015). In addition, two survey versions (one with a practice task and one without) were implemented with the experiments in an alternate order (3, 2, 1, 4 instead of 1, 2, 3, 4) to make sure that the order was not having an effect, as has been documented in, inter alia, Carlsson et al. (2012). This gave us four groups of equal size.

4. Methods

4.1. Basic specification

In this section, we present the methodology used to analyse the data. All experiments were analysed using a basic model specification, in which utility (choice probabilities) is affected by the aggregate benefits and two different indicators for the distribution in each of the distributional dimensions. First, we use the share of benefits accruing to one of the groups to capture the potential preferences for favouring one specific group over the other, after which we use the *unevenness* of the distribution (see below) to capture the potential egalitarian preference for a more equitable distribution between groups, irrespective of which group benefits the most.

$$unevenness = |B_A - B_B|$$

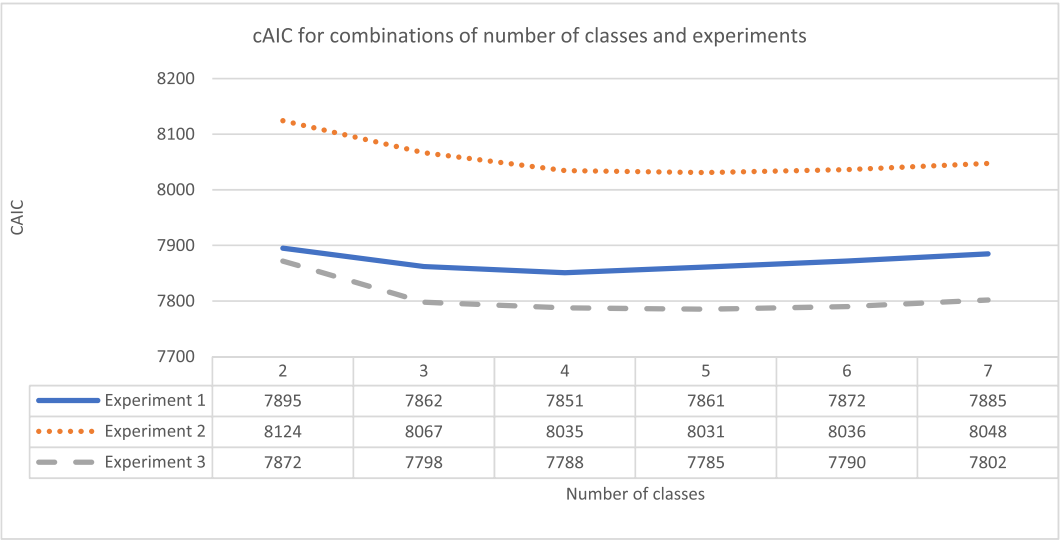
where B_A is the share of benefits accruing to group A, for example, metropolitan regions and B_B is the share of benefits accruing to group B, for example, non-metropolitan regions. Additionally, the share of benefits accruing to a particular group comes at the expense of the other. Since there is a perfect correlation between the share of benefits accruing to group A and B, only one side of the distribution (non-metropolitan regions, women, and low-income earners) was included in each model.

The way the variables are constructed entail that if the unevenness-parameter is negative and half the size of the parameter describing the share of benefits accruing group A in the dimension, which is positive, the respondents are indifferent between a 50/50

[9] The full statistical design, defining how attribute levels were combined in 18 binary choice situations, and distributed over 6 blocks of respondents, is presented in Appendix 4 – Experiment design.

[10] This was during the early stages of the COVID-19 pandemic, but at a time when the initial shock had subsided, travel recommendations within Sweden were lifted, and transmission was comparatively low (average R during this period = 0.86 (Public Health Agency of Sweden, 2020)).

[11] The 61 respondents that choose either only alternative 1 or 2 throughout the experiments are not included.



	2	3	4	5	6	7
Experiment 1	7895	7862	7851	7861	7872	7885
Experiment 2	8124	8067	8035	8031	8036	8048
Experiment 3	7872	7798	7788	7785	7790	7802

Fig. 2. cAIC for Latent Class Logit models for different number of classes.

distribution of benefits and a 60/40 distribution of benefits in favour of group A.

4.2. Capturing heterogeneity

We use two methods to capture preference heterogeneity in different ways.

(1) Binary logit with exogenous segmentation
(2) Latent Class Logit

The two methods have different strengths and facilitate the interpretation of the data in different ways. The first method, binary logit, treats observations as independent and is useful since it allows us to test our hypotheses by including interactions between preferences and dummies representing membership in exogenously defined groups/classes, giving us an understanding of the data. This allows us to directly test hypotheses using interactions. In the second model, the latent class model, heterogeneity, is endogenous. The latent class model treats data as a panel and allows for unobserved preference heterogeneity, which allows us to observe which combinations of preferences are common and which attributes are correlated with membership in each endogenously identified class, something that is useful for identifying groups within the data. This allows us to test hypotheses indirectly.

In addition to these two models, we also ran random parameter logit models as a robustness check. The random parameter logit introduces heterogeneity by allowing preferences to vary over the sample (Train, 2009). This implies that the model estimates a distribution of the parameters representing the taste variation in the sample. It also accounts for serial correlation. This feature allows us to identify attributes for which there is a large preference heterogeneity. It also has the advantage over the latent class model in that it introduces individual preferences but still provides us with an aggregate result.

The motivation for not using random parameter logit models instead of binary logit models for initial analysis is that the data cannot accommodate the large number of parameters that random parameter models with interactions would entail. The results from the random parameter models, which are presented in Appendix 2 – Random Parameter Logit, produce parameters close to those in the binary models. The random parameter models also reveal significant heterogeneity, specifically in the parameters describing preferences for (against) unevenness favouring non-metropolitan regions, women, and low-income earners.

4.3. Binary logit

The first method captures heterogeneity through interaction between the variables in Tables 1 and 2 using the mlogit-package in R (Croissant, 2020). We used a multinomial logit model, but since there were only two options per choice this is equivalent to a binary logit model. Johnston et al. (2017) state that systematic bias can arise if respondents have a status quo bias or, for some other reason, reject the scenario. They stress the importance of checking for alternative specific constants to reduce the estimates' bias. For this reason, we included alternative specific constants (ASC) in all models. The utility function for either alternative is specified as

$$V_{ji} = ASC_{ij} + \beta_1 A_j + \beta_2 U_{aj} + \beta_3 S_{aj} + \beta_4 U_{bj} + \beta_5 S_{bj} + \gamma' * E'_j + \delta' * SB'_j + \theta' * GB'_j + \varepsilon_{ij}$$

where V_{ji} is the utility the individual i derives from choosing option j.ASC_{ij} is the alternative specific constant included to capture the tendency by individual i to choose j. A is the aggregate benefit, U represents the unevenness in the distribution of dimensions a and

Table 3
Descriptive statistics of the sample compared to the Swedish population.

	Survey respondents	Swedish population*
Share in the three metropolitan regions	48%	53%
Share of women	49%	49%
Share with three or more years of university education	40%	24%
Share aged 18–40	24%	42%
Share aged 41–64	41%	42%
Share aged 65–75	35%	17%
Average income (SEK)[T]	349,620[W]	322,000

* Of the same age as the sample, i.e. between 18 and 75.
T SEK 10 roughly corresponds to about EUR 1 (Riksbank, 2021).
W 78 per cent of respondents stated income. We also excluded incomes above SEK 200,000 per month as those incomes are more consistent with annual incomes given the combination of education and employment status.

b. *S* corresponds to the share of benefits accruing to one side in the distribution, in dimensions *a* and *b,* respectively. *E*' is a vector of interactions between *S* and variables describing self-interest. *SB*' is a vector of interactions between variables describing specific beliefs and *S*. *GB*' is a vector of interactions between *S* and variables describing general beliefs. β, γ', δ' and θ' are parameters corresponding to respective variables or vector of variables. ε_{ij} is the individual and alternative specific error term.

4.4. Latent class logit

The second method, latent class logit, estimates parameters for several classes. Individuals belong to a class with a certain probability estimated using a maximum-likelihood approach following the steps described by Schaak and Musshoff (2020). One problem with latent class models is that we do not know how many classes maximise the log-likelihood or which parameters best explain the classes' preferences. Another problem is that if we estimate a model with *n* classes, we do not know if we have found preferences representing the global maxima of the log-likelihood function (Masyn, 2013). To find the set of parameters that provide the best fit for each number of classes, we ran 500 models with randomised starting values for 2–7 classes for each experiment to solicit the parameter set for each combination of classes and experiments that provide the lowest conditional AIC (cAIC) value (Bozdogan, 1987) as recommended by Masyn (2013) and Louviere et al. (2000). The conditional AIC describes which model minimise information loss given the number of parameters and observations.

Fig. 2 shows the CAIC values for the 24 combinations of classes and experiments using the BFGS maximisation method (Toomet and Henningsen, 2020). However, the number of classes is ultimately an empirical question. More classes provide better model fit at the cost of precision in the parameter estimates (Hole, 2008). Based on cAIC and parameter estimates we settled on 3, 4 and 3 classes, respectively. The variables used to explain class membership in each experiment were the variables that were significant in the interaction model. The latent class analyses were performed using the gmnl-package in R (Sarrias and Daziano, 2017)

5. Results

In this section we present the results of the analysis. We begin by presenting some descriptive statistics followed by the results from each of the experiments separately, to facilitate interpretation. We then present the MRS for each of the classes in each experiment followed by some robustness analyses. Finally, we summarise the results.

5.1. Descriptive statistics

Descriptive statistics of the respondents in comparison to the Swedish general public are presented in Table 3. The slightly higher level of education and age of the sample compared to the population in general may partly explain the slightly higher average income among survey respondents.

5.2. Experiment 1 – Geography and gender

Before pooling the data from the four different survey versions, the answers were analysed separately to ensure that there were no order or example effects. The results suggested no evidence of either effect.

The results from Experiment 1 are presented in Table 4. Looking first at the Basic model, we find that all the parameters have the expected sign and are significant. The respondents prefer large aggregate benefits. The parameters describing the unevenness are negative in both the geographical and gender dimension. The parameters describing the share of benefits accruing to women and non-metropolitan regions are positive with means that they prefer packages that disproportionately benefit women and non-metropolitan regions over packages that disproportionately benefit men and metropolitan regions. However, since changes to the unevenness variables by definition are twice the size of changes to the "Share of benefits…"-variables the typical respondent still prefers an even distribution over one that disproportionally benefit women or non-metropolitan regions. This also means that when the parameter describing the share of benefits accruing to, for example, women is twice the size of the unevenness parameter, the respondents are

Table 4
Results Experiment 1.

	Binary logit		Latent class logit		
	Basic	Interactions	Class1	Class2	Class3
Alternative specific constant alt. 2	0.177***	0.180***	0.301**	0.334***	0.184
	(0.029)	(0.029)	(0.112)	(0.092)	(0.131)
Aggregate benefits	1.322***	1.133***	5.099′	−3.145*	11.475***
	(0.374)	(0.383)	(2.964)	(1.339)	(3.159)
Geographical unevenness	−1.145***	−1.140***	−4.542**	−0.539	−1.747′
	(0.176)	(0.179)	(1.476)	(0.509)	(0.972)
Share of benefits to non-metropolitan regions	1.508***	1.215***	9.389***	−1.484′	−0.261
	(0.166)	(0.365)	(2.05)	(0.831)	(0.785)
Gender unevenness	−2.908***	−2.932***	−8.098**	−2.722***	−3.383**
	(0.261)	(0.265)	(2.557)	(0.763)	(1.196)
Share of benefits to women	2.226***	1.445*	7.591***	4.028***	−1.168
	(0.281)	(0.621)	(2.141)	(0.947)	(1.113)
	Self-interest				
Living in a metropolitan region (a) * Share of benefits to non-metropolitan regions		−1.965***			
		(0.277)			
Female * Share of benefits to women		1.904***			
		(0.544)			
	Beliefs tided to specific theories				
Belief in a just world (geographical) (a) * Share of benefits to non-metropolitan regions		−0.809**			
		(0.281)			
Belief in a just world (gender) (a) * Share of benefits to women		−2.113***			
		(0.549)			
	General beliefs				
Live in all of Sweden * Share of benefits to non-metropolitan regions		2.059***			
		(0.285)			
Big government (a) * Share of benefits to non-metropolitan regions		0.355			
		(0.285)			
Big government (a) * Share of benefits to women		1.077′			
		(0.555)			
Charity (a) * Share of benefits to non-metropolitan regions		−0.020			
		(0.282)			
Charity (a) * Share of benefits to women		0.099			
		(0.549)			
Left-leaning (a) * Share of benefits to non-metropolitan regions		0.416			
		(0.298)			
Left-leaning (a) * Share of benefits to women		0.621			
		(0.583)			
	Class inclusion				
Intercept				1.215***	0.118
				(0.167)	(0.167)
Female				1.215***	0.118
				(0.167)	(0.167)
Living in a metropolitan region (a)				1.286***	1.190***
				(0.171)	(0.151)
Belief in a just world (geographical) (a)				0.850***	0.745***
				(0.180)	(0.152)
Belief in a just world (gender) (a)				−0.158	0.066
				(0.177)	(0.142)
Live in all of Sweden				−1.048***	−1.594***
				(0.183)	(0.158)
Share of sample in class			0.415	0.279	0.306
Observations	6318	6318	6318		
Log-likelihood	−4032.4	−3958.8	−3814.7		
AIC	8076.731	7943.780	7689.438		

Parameters with SE in parenthesis. Significance codes: 0<***<0.001<**<0.01<*<0.05<′< 0.1.

indifferent between an even distribution and one that favours women. When the parameter is more than twice the size, the respondents prefer an uneven distribution. The alternative-specific constant indicates that there is a tendency to choose alternative two over alternative one, as discussed above.

In the interactions model, self-interest variables have the expected sign and are significant. Women prefer packages that entail a larger share of benefits accruing to women than men. Respondents also prefer packages that provide the region they reside in with a large share of the benefits. Regarding specific beliefs, in both dimensions the variables for the belief in a just world produce the

expected results[12]. Those who believe the world to be fair in the geographical and gender dimension demand less redistribution in those dimensions than those who do not. Among general beliefs, only people who have the strongest belief that it is important that people can *live in all of Sweden* had a significant interaction on the 5 per cent level, with the expected sign. They prefer packages in which a larger share of benefits accrue to non-metropolitan regions.

In the latent class analysis, we used three classes. Those in Class 1 think that it is important that the benefits are evenly distributed across regions and gender, with a slight tendency to prefer more benefits accruing to regions outside the metropolitan areas. This group is characterised by living outside the metropolitan regions, that they think it is as important that people can live in the whole of Sweden, and that your chances in life depend on where you grew up. People in Class 2 are mostly concerned with an even distribution in the gender dimension and are very negative towards packages that entail an uneven distribution in favour of men. Members of Class 2 prefers packages with less aggregate benefits over those with more, a preference in clear violation of the axiom that individuals prefer more over less. The distinguishing characteristic of those in Class 2 is being a woman and living in a metropolitan region, not believing that it is important that people can live in all of Sweden and that it does not matter where you are born. The members of Class 3 strongly prefer packages with large aggregate benefits and that are even in the gender dimension. Membership of this class is similar to that of Class 2 with the difference that members of Class 3 are more likely to be men.

5.3. Experiment 2 – Geography and income

The results from Experiment 2 are presented in Table 5. As is the case in Experiment 1, the basic model's parameters are significant and have the expected signs. In the Interactions model, we again see that self-interest variables are significant and of the expected sign. Those who live in metropolitan regions are not as keen on packages that accrue large benefits to non-metropolitan regions as the inhabitants of those regions. Those who think that they have a relatively low income also receive more utility from packages that accrue large benefits to those on a low income. All of the parameters aimed at specific beliefs are significant; however, the variable describing the belief in a just world in the income dimension is positive, contrary to what one might expect from a group favouring progressive redistribution in the income dimension. That said, the results also show that those who think that they will belong to a higher social class in the future demand less redistribution, as one would expect.

Regarding the impact of variables describing general beliefs, the interaction between the idea that it is important to be able to live in all of Sweden and the share of benefits accruing to non-metropolitan regions is once again significant and of the expected sign. The respondents who believe that it is the government's job to reduce the gap between the rich and poor also receive higher utility from packages where those on low incomes receive a larger share of the benefits. Also, interactions with the altruism indicator (charity) produce parameters of the expected sign, indicating that respondents who donate to charity receive higher utility from benefits accruing to people in non-metropolitan regions and with low incomes than people who do not.

The members of Class 1 in the latent class analysis, the second largest of the four classes, dislike unevenness in the income and geographical dimension. They also have a strong preference for packages that entail large benefits for non-metropolitan regions. Members of this group are more likely to live in non-metropolitan regions and believe that it is important to be able to live in all of Sweden. Class 2 prefers an even distribution of benefits in both the geographical and income dimension and, unlike Class 1, prefers packages in which a larger share of benefits end up in metropolitan regions and benefit to low-income earners. Members of this class are more likely to be low-income earners living in metropolitan regions, believing that where you grew up does not impact your life changes and not donating to charity. Class 3 is the only class which has a positive and significant parameter for aggregate benefits, it is also the largest class making up over 50 per cent of respondents. Apart from aggregate benefits this class also prefer packages with a larger share of benefits accruing to high-income earners. Membership in Class 3 is characterised by respondents believing they have a relatively high income, that they will belong to a higher social class in the future and the belief that Sweden is not fair from an income perspective. Class 4, and by far the smallest class, with <3 per cent of the respondents display no discernible preferences. Membership in this class is characterised by donating to charity, a low-income, the belief that where you are grew up impacts your life chances and that it is the governments job to reduce the gap between rich and poor.

5.4. Experiment 3 – Gender and income

The results from Experiment 3 are presented in Table 6. The parameters of the basic model are significant and display the expected sign. The aggregate benefits parameter loses much of its significance in the interactions model. While this loss of significance does not coincide with significant interactions with the aggregate benefits variable, removing interactions returns significance to the parameter for aggregate benefits. The parameter for benefits to low-income earners also loses its significance. However, the self-interest variables behave as expected. The parameters describing how preferences correspond to specific beliefs, on the other hand, have lost almost all significance. The exception is the total belief in a just world (gender), which still displays some significance, albeit at the 10 per cent level, and the expected sign. Two general beliefs also display significance. Those who think it is the government's job to reduce the gap between rich and poor and those voting for left-wing parties demand more benefits for those on lower incomes.

Members of Class 1 display strong preferences for packages that entail large aggregate benefits as well as a larger share of benefits accruing to low-income earners. Membership in this class is characterised by being male and believing that Sweden is fair in the income

[12] Initially we included a general belief in a just world variable based on general questions about the fairness of Swedish society. This variable did not produce any significant results and was therefore omitted.

Table 5
Results Experiment 2.

	Binary logit		Latent class logit			
	Basic	Interactions	Class1	Class2	Class3	Class4
Alternative specific constant alt. 2	0.115***	0.118***	0.281*	0.306′	−0.045	0.339
	(0.028)	(0.028)	(0.128)	(0.180)	(0.075)	(0.288)
Aggregate benefits	1.072***	0.983**	−0.031	1.653	2.007*	27.522
	(0.306)	(0.336)	(1.219)	(2.814)	(0.915)	(19.253)
Geographical unevenness	−1,183***	−1.211***	−1.974***	−4.320*	−0.225	−20.835
	(0.164)	(0.167)	(0.591)	(1.773)	(0.509)	(14.316)
Share of benefits to non-metropolitan regions	1.681***	1.418***	8.681***	−7.253***	0.041	18.880′
	(0.139)	(0.346)	(1.771)	(1.793)	(0.718)	(9.977)
Income unevenness	−1.145***	−1.194***	−2.256***	−4.454**	−0.228	−14.084
	(0.111)	(0.113)	(0.452)	(1.397)	(0.314)	(9.790)
Share of benefits to low-income earners	1.181***	−0.952**	0.795	3.054*	−1.385***	34.309′
	(0.138)	(0.320)	(0.687)	(1.458)	(0.414)	(19.275)
	Self-interest					
Living in a metropolitan region (a) * Share of benefits to non-metropolitan regions		−1.766***				
		(0.274)				
Relatively low income (a) * Share of benefits to low-income earners		0.980***				
		(0.277)				
	Beliefs tided to specific theories					
Belief in a just world (geographical) (a) * Share of benefits to non-metropolitan regions		−0.610*				
		(0.277)				
Belief in a just world (income) (a) * Share of benefits to low-income earners		0.561*				
		(0.275)				
Prospect of upward mobility (a) * Share of benefits to low-income earners		−0.779*				
		(0.393)				
	General beliefs					
Live in all of Sweden * Share of benefits to non-metropolitan regions		1.841***				
		(0.281)				
Big government (a) * Share of benefits to non-metropolitan regions		−0.340				
		(0.280)				
Big government (a) * Share of benefits to low-income earners		0.179				
		(0.284)				
Smaller gap between rich and poor * Share of benefits to low-income earners		1.892***				
		(0.303)				
Charity (a) * Share of benefits to non-metropolitan regions		0.730**				
		(0.276)				
Charity (a) * Share of benefits to low-income earners		0.809**				
		(0.273)				
Left-leaning (a) * Share of benefits to non-metropolitan regions		0.266				
		(0.293)				
Left-leaning (a) * Share of benefits to low-income earners		0.552′				
		(0.299)				
	Class inclusion					
Intercept				1.364***	0.526***	0.866***
				(0.15)	(0.125)	(0.169)
Living in a metropolitan region (a)				1.364***	0.526***	0.866***
				(0.150)	(0.125)	(0.169)
Relatively low income (a)				0.487***	−0.354**	0.581**
				(0.138)	(0.127)	(0.177)
Belief in a just world (geographical) (a)				0.606***	0.402***	−0.772***
				(0.128)	(0.121)	(0.188)
Belief in a just world (income) (a)				−0.061	−0.399***	−0.037
				(0.128)	(0.121)	(0.165)
Prospect of upward mobility (a)				0.395*	0.847***	0.175
				(0.201)	(0.184)	(0.253)
Live in all of Sweden				−1.202***	−1.451***	−0.719***
				(0.157)	(0.143)	(0.206)
Smaller gap between rich and poor				0.198	−0.046	2.091***
				(0.137)	(0.131)	(0.305)
Charity (a)				−0.333*	0.027	0.588***
				(0.130)	(0.121)	(0.170)
Share of sample in class			0.303	0.112	0.555	0.025
Observations	6318	6318	6318			
Log-likelihood	−4108.1	−4005.4	−3868.4			
AIC	8228.191	8050.753	7838.715			

Parameters with SE in parenthesis. Significance codes: 0<***<0.001<**<0.01<*<0.05<′< 0.1.

Table 6
Results Experiment 3.

	Binary logit		Latent class logit		
	Basic	Interactions	Class1	Class2	Class3
Alternative specific constant alt. 2	0.115***	0.115***	−0.050	0.346**	−0.374′
	(0.034)	(0.035)	(0.151)	(0.117)	(0.207)
Aggregate benefits	0.876**	0.643′	10.035***	2.751**	−8.427***
	(0.339)	(0.366)	(1.659)	(0.927)	(2.405)
Gender unevenness	−2.544***	−2.551***	−1.927′	−8.027***	4.706*
	(0.276)	(0.279)	(1.124)	(1.204)	(1.952)
Share of benefits to women	1.832***	1.325*	3.044′	5.879***	2.227
	(0.325)	(0.637)	(1.701)	(1.181)	(1.588)
Income unevenness	−1.088***	−1.104***	−0.446	−2.951***	−1.085*
	(0.138)	(0.139)	(0.577)	(0.459)	(0.508)
Share of benefits to low-income earners	2.013***	0.307	3.314***	6.159***	−2.729**
	(0.157)	(0.335)	(0.916)	(0.843)	(1.039)
	Self-interest				
Female * Share of benefits to women		1.932***			
		(0.540)			
Relatively low income (a) * Share of benefits to low-income earners		1.111***			
		(0.283)			
	Beliefs tided to specific theories				
Belief in a just world (gender) (a) * Share of benefits to women		−1.015′			
		(0.542)			
Belief in a just world (income) (a) * Share of benefits to low-income earners		0.186			
		(0.280)			
Prospect of upward mobility (a) * Share of benefits to low-income earners		−0.485			
		(0.404)			
	General beliefs				
Big government (a) * Share of benefits to women		−0.695			
		(0.555)			
Big government (a) * Share of benefits to low-income earners		0.216			
		(0.294)			
Smaller gap between rich and poor * Share of benefits to low-income earners		1.568***			
		(0.308)			
Charity (a) * Share of benefits to women		0.334			
		(0.548)			
Charity (a) * Share of benefits to low-income earners		0.119			
		(0.284)			
Left-leaning (a) * Share of benefits to women		0.634			
		(0.583)			
Left-leaning (a) * Share of benefits to low-income earners		0.915**			
		(0.310)			
	Class inclusion				
Intercept				0.409**	−0.003
				(0.138)	(0.146)
Female				0.834***	0.785***
				(0.102)	(0.118)
Relatively low income (a)				0.34***	0.066
				(0.097)	(0.118)
Belief in a just world (gender) (a)				−0.191*	0.128
				(0.095)	(0.109)
Belief in a just world (income) (a)				−0.294**	−0.416***
				(0.096)	(0.111)
Prospect of upward mobility (a)				0.22	0.487**
				(0.155)	(0.169)
Smaller gap between rich and poor				0.348***	−0.45***
				(0.106)	(0.129)
Left-leaning (a)				0.17	0.026
				(0.106)	(0.124)
Share of sample in class			0.286	0.430	0.285
Observations	6318	6318	6318		
Log-likelihood	−4055.4	−4002.4	−3832.4		
AIC	8122.720	8042.762	7732.798		

Parameters with SE in parenthesis. Significance codes: 0<***<0.001<**<0.01<*<0.05<′< 0.1.

Table 7
MRS between distributional dimensions and aggregate benefits for full sample and each class.

	Experiment 1				Experiment 2					Experiment 3			
	Full sample	Class1	Class2	Class3	Full sample	Class1	Class2	Class3	Class4	Full sample	Class1	Class2	Class3
β-Geographical unevenness/ β-Aggregate benefits	−0.866*** [−1.134; −0.597]	−0.891*** [−1.383; −0.398]	0.172 [−0.277; 0.620]	−0.152** [−0.247; −0.058]	−1.103*** [−1.480; −0.726]	63.910 [−4905.387; 5033.207]	−2.614 [−9.495; 4.267]	−0.112 [−0.527; 0.303]	−0.757*** [−0.810; −0.704]				
β-Share of benefits to non-metropolitan regions/ β-Aggregate benefits	1.141*** [0.568; 1.713]	1.841* [0.305; 3.378]	0.472′ [−0.089; 1.033]	−0.023 [−0.164; 0.119]	1.568*** [0.622; 2.514]	−281.100 [−21990.565; 21428.366]	−4.389 [−19.599; 10.821]	0.021 [−0.685; 0.726]	−0.757*** [−0.810; −0.704]				
β-Gender unevenness/ β-Aggregate benefits	−2.200*** [−3.128; −1.272]	−1.588*** [−2.514; −0.663]	0.865 [−0.255; 1.986]	−0.295*** [−0.395; −0.194]						−2.905*** [−4.646; −1.164]	−0.192′ [−0.386; 0.002]	−2.918*** [−4.233; −1.603]	−0.558*** [−0.780; −0.337]
β-Share of benefits to women/ β-Aggregate benefits	1.684*** [0.707; 2.662]	1.489* [0.175; 2.803]	−1.281* [−2.388; −0.173]	−0.102 [−0.277; 0.073]						2.091** [0.567; 3.616]	0.303* [0.007; 0.600]	2.137** [0.770; 3.504]	−0.264 [−0.643; 0.114]
β- Income unevenness/ β-Aggregate benefits					−1.068*** [−1.529; −0.606]	73.044 [−5593.277; 5739.364]	−2.695 [−10.595; 5.205]	−0.114 [−0.369; 0.142]	−0.512*** [−0.568; −0.455]	−1.241*** [−1.962; −0.521]	−0.044 [−0.148; 0.059]	−1.073*** [−1.549; −0.596]	0.129 [−0.037; 0.294]
β- Share of benefits to low-income earners/ β-Aggregate benefits					1.101*** [0.444; 1.758]	−25.729 [−2022.473; 1971.014]	1.848 [−4.704; 8.400]	−0.690 [−1.406; 0.026]	1.247*** [0.846; 1.647]	2.298* [0.404; 4.193]	0.330*** [0.139; 0.521]	2.239*** [0.915; 3.563]	0.324** [0.094; 0.554]

Parameters with 95% confidence interval in brackets. Parameters used to calculate the "Full sample" are taken from the "Basic" models. *Significance codes: 0 < *** < 0.001 < ** < 0.01 < * < 0.05 < ′ < 0.1.*

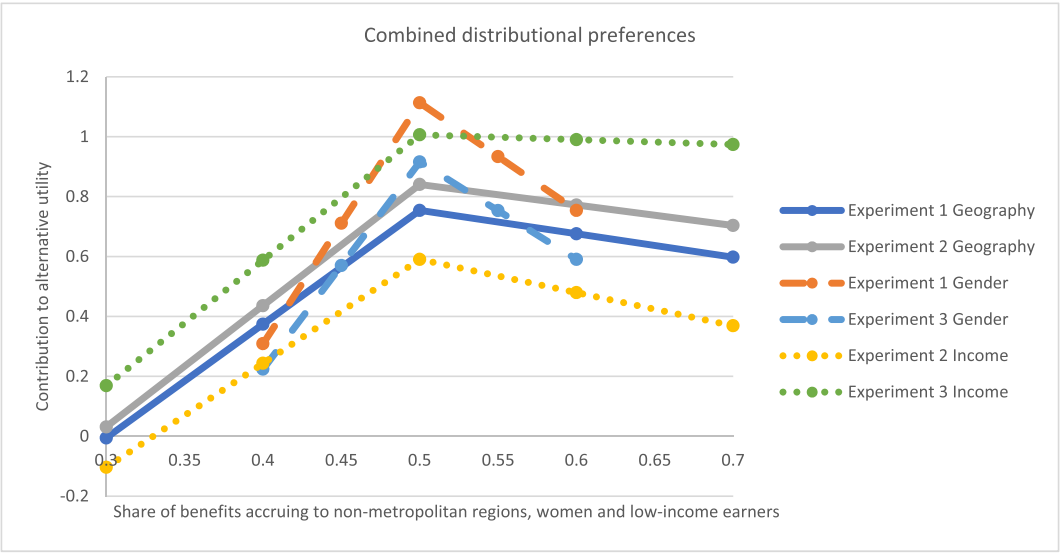


Fig. 3. Interpretation of the distributional parameters.

dimension. Members of Class 2 display similar preferences to those reflected in the basic model. Membership in the class is characterised by respondents who believe they have a relatively low income, do not believe that men and women have the same opportunities in life and that it is the government's job to reduce the gap between rich. The third and final class prefers packages with less aggregate benefits over those with more, a preference in clear violation of the axiom that individuals prefer more over less. They also prefer packages with an even distribution in the income dimension but an uneven distribution in the gender dimension as well as a large share of benefits accruing to high-income earners. Membership in this class is characterised by respondents who believe that they will belong to a higher social class in the future. This class make up almost 30 per cent of the sample.

5.5. *Marginal rates of substitution*

Calculating the marginal rate of substitution (MRS) between aggregate benefits and the other variables for each class allows us to compare the different classes' trade-offs more easily. This operation removes the scale parameter and enables comparisons across experiments. This was done using the WTP function of the gmnl-package in R, which employees the delta method (Oehlert, 1992). The MRSs for each class, as well as the full sample, are presented in Table 7.

This table is somewhat challenging to interpret. Even though most respondents belong to a class with a significant parameter for aggregate benefits, most of the classes do not have a significant parameter for aggregate benefits. The lack of significance in the denominator results in large confidence intervals when calculating the MRS for these classes. This, together with the unintuitive parameters for Class 3 in Experiment 3 is cause for caution when interpreting some of MRSs.

5.6. *Results summary*

All the basic models behave as expected. On aggregate, respondents want large benefits, equal distribution and more benefits accruing to non-metropolitan regions, women, and low-income earners, findings in line with Mouter et al. (2017a), who also found that their respondents tended to prefer an even distribution of benefits. When accounting for heterogeneity using interactions, we find that variables describing self-interest appear to be robust explanatory factors for heterogeneity, again in line with the previous literature. Overall, people prefer alternatives from which they benefit. This self-interest does not necessarily mean that they are selfish in a calculated way; it could be that they simply have a better understanding of the needs of the group to which they belong.

When analysing heterogeneity using latent classes, we get groups similar to those identified by Mouter et al. (2017a), some classes seem to be motivated by self-interest to a greater extent, other classes strongly prefer even distributions, other classes a mix. Almost all classes display preferences that mirror different components of the aggregate but with a different focus. They mostly prefer packages with an even distribution of benefits. They also tend to prefer packages that provide more benefits to women, non-metropolitan regions, low-income earners, or the group they belong to. Class membership is explained both by self-interest variables and belief variables.

The two parameters describing the preferences for distribution in each dimension might appear a bit paradoxical. On one hand they appear to prefer even distributions and on the other hand they appear to (in general) prefer packages that are uneven in favour of non-metropolitan regions, women, and low-income earners. To facilitate interpretation of these results we plotted the combined utility contribution from the distributional parameters from the basic models in Fig. 3. The narrower the angle at the 50 percent mark, the more respondents prefer an even distribution and the steeper upward slope (in this case flatter) to the right side of 50 percent mark, the

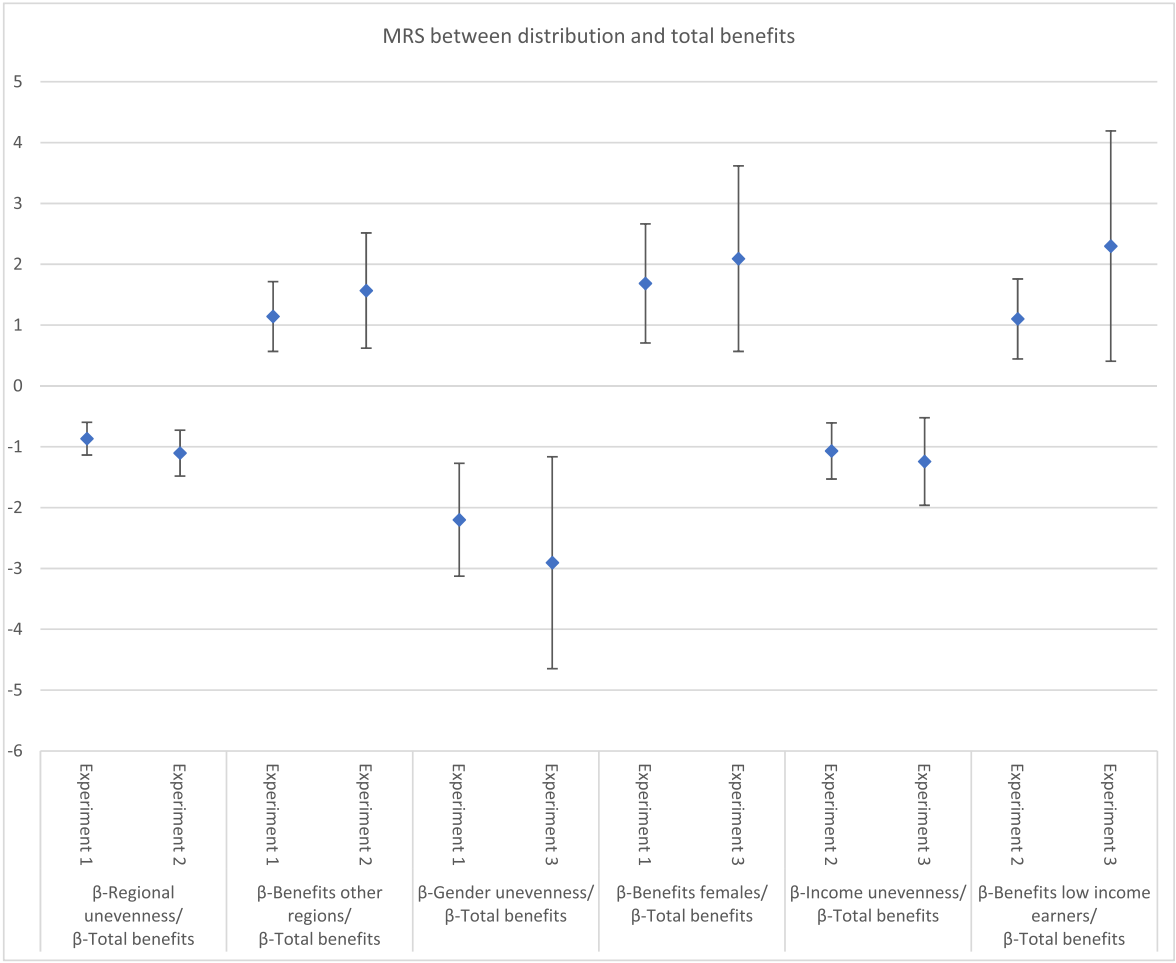


Fig. 4. Marginal rate of substitution between distribution and aggregate benefits. 95% confidence interval.

more they prefer packages in which a larger share of benefits accrue to non-metropolitan regions, women, and low-income earners. The figure shows that respondents, in general, think that an even distribution is preferable in all dimensions, but also that they think that evenness is more important in the gender dimension than in the other two in which they are relatively more inclined to prefer packages with a larger share of benefits accruing to non-metropolitan regions and low-income earners.

5.7. Robustness tests

To ensure that the survey results are reasonable and do not contain any unwanted effects of the dimensions included in each experiment or the order of the experiments, we performed a number of robustness tests. This entailed examining the transitivity between experiments and studying how the order and the presence of a practice choice impacted the results.

5.8. Respondent transitivity

To make sure that the preferences for an attribute did not depend on which other attributes were included in the experiment, we calculated the marginal rate of substitution (MRS) between the various distributional attributes and aggregate benefits to compare the MRS between the basic models used to analyse the experiments. The results are presented in Fig. 4. Based on Fig. 4, we conclude that the respondents' aggregate preferences were independent of which attributes were included in the experiment.

5.9. Robustness with respect to survey design: Examples and order of experiments

To ensure that results were not biased by the order in which the respondents answered the experiments or the practice choice/example, we analysed the four groups separately for each experiment. We then compared them using the same method as in the previous section.

Our results suggest that order or examples did not significantly impact the MRS between the different distributional dimensions and aggregate benefits. However, in one group in Experiment 2 (i.e., one-twelfth of the groups), we are unable to estimate significant parameters for aggregate benefits, which leads to huge standard errors for the MRS. This subgroup received no example and order 1, 2, 3. We would therefore argue that it is fair to assume that, while an example might have a positive effect on the understanding of the experiments, it does not seem to have a significant impact on preferences. Furthermore, the non-significant parameter for aggregate benefits in one of the groups in Experiment 2 is not enough to conclude that we detected any systematic impact on MRS from the ordering of experiments.

We did however detect a systematic bias for choosing the second alternative in the choice set. In our case, since there was no status quo or opt-out alternative, people might have selected alternative two as it was closer to the next question at the bottom of the survey. To make sure that this effect was not amplified towards the end of the experiments due to fatigue, we looked at the share of "alternative two" answers depending on how many experiments the respondents had answered. The share of alternative two responses did not appear to increase when the respondents had answered many questions. Please note that alternative two bias is captured in the *Alternative specific constant alt. 2.*

6. Discussion

6.1. Self-interest

The variables describing self-interest behave in the way we would expect. Both the interaction-models and the latent class analysis show that people, if anything, tend to prefer packages that entail more benefits to the group to which they belong. If this is a result of pure self-interest or a greater familiarity with the predicament of the own group is unknown to us.

6.2. Belief in a just world and the prospect of upward mobility

The belief in a just world along the geography and gender dimensions contributes to weaker demand for redistribution in the respective dimension, in line with theory. That said, the relationship between preferences and the belief in a just world in the income dimension is more ambiguous. The results from the interactions model in Experiment 2 suggest that a belief in a just world in the income dimension correlates with a higher demand for redistribution. In the latent class model, not believing that the world is just in the income dimension increases the likelihood of belonging to the class with a negative demand for redistribution in the income dimension. Both these results contradict the belief in a just world theory. In Experiment 3 however, those who believe that Sweden is just in the income dimension are more likely to belong to Class 1, which has a lower willingness to forego aggregate benefits in favour of the share of benefits accruing to low-income earners than the sample aggregate. The results regarding the belief in a just world in the income dimension are thus quite disparate.

One difference between the income dimension and gender and geography is that the variable used to describe the income dimension is constructed out of multiple questions instead of one. To ensure that we had not done a poor job constructing it, we tested other specifications of that indicator, but they all yielded the same results.

There are several possible explanations for the unexpected results regarding belief in a just world in the income dimension. One explanation could be that people who believe that effort rather than background determine success believe that this will lead to increased inequality that needs to be compensated for. Another explanation could be that people who believe that effort rather than luck determine success also believe that income is a fundamental resource needed for people to rise to their potential. If they believe that that people should have this opportunity, this would prompt them to demand more redistribution.

The parameters of the POUM variables are significant and with the expected sign in Experiment 2, both in the interactions model and the latent class analysis. In Experiment 3, however, this is not the case. The variable in the interactions model is not significant, however, it behaves as theory predicts in the latent class analysis.

6.3. The impact of general beliefs

The two general beliefs that consistently produced significant results were the respondent believed it was important that people can live in all of Sweden and that it is the government's job to reduce the gap between rich and poor. That people can live in all of Sweden, even in less densely populated regions, is an important political issue in Sweden. Those who agreed with this proposition also wanted to see more resources allocated to regions outside the three metropolitan regions. Those who responded that they believe that it is the government's job to reduce the gap between rich and poor also demand greater redistribution in the income dimension.

6.4. Shortcomings

When we designed the experiments, we were concerned that respondents would not understand the aggregate benefits attribute. Based on the results from the pilot survey, we conclude that this is not the case. The results from Class 2 and 3 in Experiments 1 and 3 respectively, indicate that our conclusion may have been premature, at least to some extent. Additional analyses of those who have a negative valuation of aggregate benefits show that, if anything, it is the lack of higher education that explains membership in this class.

While the results from Class 2 and 3 in Experiment 1 and 3 violate economic theory, we maintain that the respondents have generally understood the aggregate benefits attribute. In the case of Class 3 in Experiment 3 the unintuitive sign on the aggregate

benefits parameter in conjunction with the unintuitive sign on the gender unevenness parameter could also result from scenario rejection (Johnston et al., 2017).

Another explanation for the counterintuitive results of Experiment 3 could be that the experiment is perceived as less realistic than the other experiments. While income and gender are important distributional dimensions in transport policy, they are less tangible than geography, which is easier to connect to transport. It could be that geography helped maintain realism in Experiment 1 and 2. This theory is somewhat supported by the larger confidence interval in the MRS between aggregate benefits and the distributional dimensions in Fig. 4.

6.5. Policy implications?

So, what does all this tell us about the respondents' preferences for distribution more generally? Even though the progressivity of the Swedish tax system has declined over the past 20 years, Sweden's combination of taxes, general transfers and welfare services maintains inequality at a relatively low level (Causa and Hermansen, 2019). Despite this, we observe a demand for the redistribution of the benefits of transport infrastructure investments. These results could be interpreted as reflecting a perception among respondents that the current distribution of welfare is undesirable as well as a desire to adjust it towards a more equitable distribution using other channels than the welfare system.

While infrastructure is a public service, it is also a very blunt instrument for redistribution, particularly in the gender and income dimensions. Additionally, we lack methods to credibly identify which investments benefit low-income earners or a specific gender, particularly on an aggregate level such as that depicted in the experiments. Even if we could credibly identify the distribution of benefits in the gender and income dimension, the transport market is merely an intermediate market, making it more challenging to determine who receives the benefits. That said, it is more credible that the benefits remain within the respective region in the geography dimension.

This inability to redistribute through infrastructure is not necessarily widely known. Rather, infrastructure is perceived as a tangible way of rewarding a specific group. If there is a perception that benefits from infrastructure investments can be targeted in the way depicted in the experiments, people will demand it. Individuals might also want to correct what they perceive as an unfair distribution in one sector in another. Based on these two points, an alternative way to interpret the results would be as general preferences expressed through the medium of transport investments, rather than as distributive preferences for transport investments. If this is the case, it also allows us to find more appropriate vehicles for redistribution. Additionally, we believe that there are reasonable grounds to question whether respondents have well-formed preferences for transport investments or if they simply apply general preferences for distribution in a process of substitution heuristics (Kahneman, 2011). However, we have no data to support or discard this hypothesis.

7. Conclusions

This study shows that, in general, preferences for the distribution of benefits from transport investments are as we expected. The study contributes to the literature by including more distributional dimensions than previous studies, showing that respondents' preferences are transitive and appear relatively unaffected by combinations of dimensions.

On aggregate, respondents prefer infrastructure packages that provide evenly distributed, large aggregate benefits. Additionally, if the benefits are unevenly distributed respondents prefer packages that are uneven in favour of women, low-income earners and regions outside metropolitan areas. We also identify differences among groups. These groups are characterised by variables related to self-interest and the extent to which they consider Swedish society to be fair in the different dimensions. We also find that more general beliefs, such as if it is important that people can live in all of Sweden and that the government should reduce the gap between rich and poor, explain preference heterogeneity. We also find some support for the hypothesis that belief in the fairness of Swedish society reduces the demand for redistribution through public-sector transport infrastructure investments. This finding is consistent with other studies of redistribution through the welfare system (Karadja et al., 2017). We also find support for the hypothesis of the prospect of upward mobility.

From a policy perspective, a couple of conclusions can be drawn. Firstly, that the overarching goal for the Swedish transport sector, *ensuring the provision of economically efficient, sustainable transport services for the general public and businesses throughout the country* (Government Offices of Sweden, 2021), seems to mirror the public's preferences. Secondly, that the respondents display distributional preferences that cannot easily be met through transport infrastructure investments, even if they are not necessarily aware of this.

As our results show, there is a tendency among respondents to demand packages that disproportionally benefit women, people outside metropolitan regions and low-income earners, this could be interpreted as an indication that groups of the Swedish public do not find the current distribution of the benefits from the transport system as the most desirable. However, we do not necessarily believe that this should have large consequences for transport appraisal, at least not in the short term. At the present time, we are unable to credibly identify the distributional impacts of transport infrastructure investments in all dimensions. Furthermore, transport investments are a blunt instrument for changing the distributional profile, meaning that we cannot reduce differences in these dimensions with any precision through transport infrastructure investments. Instead, welfare and tax systems offer tools to do this with greater precision. This conclusion does not imply that the state should never intervene to correct undesirable distributions in the transport sector; if undesirable imbalances exist, they can be addressed, although it is probably more efficient to do so through targeted economic incentives or legislation.

CRediT authorship contribution statement

Anders Bondemark: Conceptualization, Methodology, Formal analysis, Data curation, Writing – original draft, Writing – review & editing, Project administration. **Henrik Andersson:** Conceptualization, Methodology, Formal analysis, Supervision. **Karin Brundell-Freij:** Methodology, Formal analysis, Supervision.

Declaration of Competing Interest

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

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Appendix 1. – Choice Situations

The table below shows the information presented to the respondents in conjunction with the first choice as well as an example of a choice set. Each cell in the table represents a pane in the survey (see Table 8).

Table 8
Respondent instructions and information.

How should different objectives be prioritised?

- When making decisions, public-sector policymakers must prioritise between different objectives. They are often forced to accept some adverse effects to achieve other positive effects.
- We want to know how you would prioritise if you could decide how resources should be distributed within the transport system. We will ask you to choose between different options consisting of packages of infrastructure investments.
- In each question, we will describe two options and how they differ in terms of effects. Your task is to choose the one you prefer.
- The questions differentiate in five dimensions that will be introduced along the way.
- The dimensions are explained when they are introduced. If you need to be reminded, you may reread the explanation.
- Your choices are made within a fixed budget. They do not affect how high your taxes are or what share of the taxpayers' money is allocated to the transport system.

Choice situation 1: Societal surplus per SEK, geographical distribution, and gender distribution. Your first task is to make three choices between alternatives that differ in terms of societal surplus per SEK, geographical distribution, and gender distribution. **Societal surplus per SEK**

- Imagine all the positive and negative effects of the packages can be translated into money. These can then be compared with the cost to describe the societal surplus per invested SEK.
- If the societal surplus per invested SEK is 0.5, this means that the positive effects as a result of the investment correspond to SEK 1.5, which results in a profit of SEK 0.5.
- A higher societal surplus per invested SEK means more positive effects per invested SEK.

Geographical distribution

- There are roughly the same number of people living in each region.
- We will describe how large a share of the positive effects accrues to the inhabitants of each region.

Gender distribution

- Describes how large a share of the positive effects accrues to women and men respectively.

The choices

- You will now make three choices, for each of which you will be asked to select one of two options.
- Each choice is a new question – please do not take your previous choices into consideration.
- Answer honestly and thoughtfully. In the future, your answers might affect how we assess real infrastructure projects and packages of projects.

(*continued on next page*)

Table 8 (*continued*)

How should different objectives be prioritised?

- When making decisions, public-sector policymakers must prioritise between different objectives. They are often forced to accept some adverse effects to achieve other positive effects.
- We want to know how you would prioritise if you could decide how resources should be distributed within the transport system. We will ask you to choose between different options consisting of packages of infrastructure investments.
- In each question, we will describe two options and how they differ in terms of effects. Your task is to choose the one you prefer.
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Choice situation 1: Societal surplus per SEK, geographical distribution, and gender distribution.

Your first task is to make three choices between alternatives that differ in terms of societal surplus per SEK, geographical distribution, and gender distribution.

Societal surplus per SEK

- Imagine all the positive and negative effects of the packages can be translated into money. These can then be compared with the cost to describe the societal surplus per invested SEK.
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Geographical distribution

- There are roughly the same number of people living in each region.
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- Describes how large a share of the positive effects accrues to women and men respectively.

The choices

- You will now make three choices, for each of which you will be asked to select one of two options.
- Each choice is a new question – please do not take your previous choices into consideration.
- Answer honestly and thoughtfully. In the future, your answers might affect how we assess real infrastructure projects and packages of projects.

(*continued on next page*)

Table 8 (*continued*)

Alternative A		
Societal surplus per SEK	0.4	
Geographical distribution	**Metropolitan regions**	**Other regions**
Share of positive effects accruing to respective region	70%	30%
Gender distribution	**Women**	**Men**
Share of positive effects accruing to women and men respectively	50%	50%

Alternative B		
Societal surplus per SEK	0.1	
Geographical distribution	**Metropolitan regions**	**Other regions**
Share of positive effects accruing to respective region	40%	60%
Gender distribution	**Women**	**Men**
Share of positive effects accruing to women and men respectively	40%	60%

Previous Question Next Question

Appendix 2. – Random parameter logit

We assumed that all parameter followed a normal distribution in the estimation of the random parameter logit models. The random parameter logit analyses were performed using the mlogit package and results are presented in Table 9.

Table 9
Results of random parameter logit models. Standard errors in parenthesis.

	Experiment 1	Experiment 2	Experiment 3
Alternative specific constant alt. 2	0.362***	0.166**	0.102′
	(0.073)	(0.050)	(0.060)
Aggregate benefits	−0.177	1.529**	1.468*
	(0.853)	(0.570)	(0.605)
Geographical unevenness	−1.416***	−2.083***	
	(0.372)	(0.323)	
Share of benefits to non-metropolitan regions	2.615***	3.079***	
	(0.456)	(0.348)	
Gender unevenness	−4.700***		−4.753***
	(0.698)		(0.582)
Share of benefits to women	4.996***		3.544***
	(0.789)		(0.630)
Income unevenness		−2.106***	−2.175***
		(0.257)	(0.285)
Share of benefits to low-income earners		1.980***	3.897***
		(0.289)	(0.396)

(*continued on next page*)

Table 9 (*continued*)

	Experiment 1	Experiment 2	Experiment 3
	Standard deviations for random parameters		
Standard deviation Aggregate benefits	7.742***	4.604***	7.248***
	(1.265)	(1.256)	(0.987)
Standard deviation Geographical unevenness	3.112***	2.555***	
	(0.659)	(0.538)	
Standard deviation Share of benefits to non-metropolitan regions	7.743***	5.806***	
	(1.358)	(0.895)	
Standard deviation Gender unevenness	4.992***		4.533***
	(1.302)		(1.018)
Standard deviation Share of benefits to women	9.994***		7.691***
	(2.474)		(2.045)
Standard deviation Income unevenness		2.649***	2.369***
		(0.423)	(0.447)
Standard deviation Share of benefits to low-income earners		5.692***	6.216***
		(0.866)	(0.923)
Observations	6318	6318	6318
Log-likelihood	−3920.7	−4011.5	−3956.7
AIC	7843.553	8035.844	7802.795

Appendix 3. – Correlation Matrix

Table 10

Table 10
Pearson correlations between variables describing the hypotheses.

	Female (a)	Relatively low income (a)	Living in a metropolitan region (a)	Belief in a just world (geographical) (a)	Belief in a just world (gender) (a)	Belief in a just world (income)	Prospect of upward mobility (a)	Big government (a)*	Live in all of Sweden	Smaller gap between rich and poor	Charity (a)	Left-leaning (a)
Female	1.00	0.14	0.03	−0.04	−0.10	0.00	0.07	0.07	0.08	0.08	0.00	0.03
Relatively low income (a)	0.14	1.00	−0.06	−0.04	−0.06	−0.06	−0.01	0.03	0.21	0.21	−0.12	0.11
Living in a metropolitan region (a)	0.03	−0.06	1.00	0.01	0.03	0.01	0.02	−0.02	−0.06	−0.03	0.01	−0.03
Belief in a just world (geographical) (a)	−0.04	−0.04	0.01	1.00	0.59	0.08	−0.02	0.05	0.00	0.03	−0.01	0.00
Belief in a just world (gender) (a)	−0.10	−0.06	0.03	0.59	1.00	0.10	−0.01	0.03	0.05	0.00	0.01	−0.04
Belief in a just world (income)	0.00	−0.06	0.01	0.08	0.10	1.00	0.03	−0.06	0.01	−0.17	0.05	−0.12
Prospect of upward mobility (a)	0.07	−0.01	0.02	−0.02	−0.01	0.03	1.00	−0.03	−0.06	−0.03	−0.02	0.00
Big government (a)*	0.07	0.03	−0.02	0.05	0.03	−0.06	−0.03	1.00	0.08	0.31	0.06	0.17
Live in all of Sweden	0.08	0.21	−0.06	0.00	0.05	0.01	−0.06	0.08	1.00	0.23	0.03	0.05
Smaller gap between rich and poor	0.08	0.21	−0.03	0.03	0.00	−0.17	−0.03	0.31	0.23	1.00	0.06	0.31
Charity (a)	0.00	−0.12	0.01	−0.01	0.01	0.05	−0.02	0.06	0.03	0.06	1.00	0.10
Left-leaning (a)	0.03	0.11	−0.03	0.00	−0.04	−0.12	0.00	0.17	0.05	0.31	0.10	1.00

Appendix 4. – Experiment design

The following tables contain the designs of experiments 1, 2 and 3.
Tables 11, 12 and 13

Table 11
Experiment 1 design.

	Block 1		Block 2		Block 3		Block 4		Block 5		Block 6	
Question 1	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2
Societal surplus	0.4	0	0.1	0.5	0.3	0.5	0.1	0.3	0	0.4	0.1	0
Share accruing to metropolitan regions	30%	50%	50%	70%	50%	30%	50%	30%	50%	70%	70%	50%
Share accruing to non-metropolitan regions	70%	50%	50%	30%	50%	70%	50%	70%	50%	30%	30%	50%
Share accruing to women	40%	50%	50%	40%	50%	60%	50%	60%	50%	40%	50%	40%
Share accruing to men	60%	50%	50%	60%	50%	40%	50%	40%	50%	60%	50%	60%
Question 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2
Societal surplus	0.2	0.3	0.1	0	0.4	0	0.3	0.3	0.3	0.1	0.2	0.2
Share accruing to metropolitan regions	50%	30%	70%	50%	70%	50%	40%	40%	70%	50%	50%	30%
Share accruing to non-metropolitan regions	50%	70%	30%	50%	30%	50%	60%	60%	30%	50%	50%	70%
Share accruing to women	60%	50%	50%	40%	40%	50%	40%	50%	40%	50%	60%	50%
Share accruing to men	40%	50%	50%	60%	60%	50%	60%	50%	60%	50%	40%	50%
Question 3	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2
Societal surplus	0.3	0.3	0.1	0.1	0.4	0.4	0.2	0	0.1	0.2	0.1	0.5
Share accruing to metropolitan regions	70%	50%	30%	50%	50%	30%	70%	50%	50%	70%	50%	70%
Share accruing to non-metropolitan regions	30%	50%	70%	50%	50%	70%	30%	50%	50%	30%	50%	30%
Share accruing to women	50%	40%	50%	60%	60%	50%	40%	50%	60%	50%	50%	60%
Share accruing to men	50%	60%	50%	40%	40%	50%	60%	50%	40%	50%	50%	40%

Table 12
Experiment 2 design.

	Block 1		Block 2		Block 3		Block 4		Block 5		Block 6	
Question 1	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2
Societal surplus	0.4	0	0.1	0.5	0.2	0.2	0.1	0	0.5	0.4	0.2	0
Share accruing to metropolitan regions	30%	50%	50%	70%	50%	30%	70%	50%	30%	40%	30%	50%
Share accruing to non-metropolitan regions	70%	50%	50%	30%	50%	70%	30%	50%	70%	60%	70%	50%
Share accruing to low-income earners	30%	50%	50%	70%	30%	50%	50%	70%	70%	50%	50%	30%
Share accruing to high-income earners	70%	50%	50%	30%	70%	50%	50%	30%	30%	50%	50%	70%
Question 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2
Societal surplus	0.2	0.2	0.2	0.1	0.2	0	0.5	0.1	0.3	0.1	0	0.4
Share accruing to metropolitan regions	50%	70%	30%	50%	30%	50%	70%	50%	70%	50%	50%	30%
Share accruing to non-metropolitan regions	50%	30%	70%	50%	70%	50%	30%	50%	30%	50%	50%	70%
Share accruing to low-income earners	70%	50%	50%	70%	70%	50%	70%	50%	30%	50%	50%	30%
Share accruing to high-income earners	30%	50%	50%	30%	30%	50%	30%	50%	70%	50%	50%	70%
Question 3	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2
Societal surplus	0.4	0.3	0.1	0.1	0.2	0.4	0.2	0	0.2	0.2	0.1	0.4
Share accruing to metropolitan regions	70%	50%	30%	50%	50%	30%	30%	50%	50%	70%	50%	70%
Share accruing to non-metropolitan regions	30%	50%	70%	50%	50%	70%	70%	50%	50%	30%	50%	30%
Share accruing to low-income earners	50%	70%	50%	70%	70%	50%	30%	50%	30%	50%	50%	30%
Share accruing to high-income earners	50%	30%	50%	30%	30%	50%	70%	50%	70%	50%	50%	70%

Table 13
Experiment 3 design.

	Block 1		Block 2		Block 3		Block 4		Block 5		Block 6	
Question 1	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2
Societal surplus	0.4	0.5	0.2	0.4	0.5	0.1	0.1	0	0.5	0.5	0.1	0
Share accruing to women	60%	50%	50%	60%	60%	50%	50%	40%	50%	40%	60%	50%
Share accruing to men	40%	50%	50%	40%	40%	50%	50%	60%	50%	60%	40%	50%
Share accruing to low-income earners	50%	70%	50%	30%	70%	50%	30%	50%	70%	50%	50%	70%
Share accruing to high-income earners	50%	30%	50%	70%	30%	50%	70%	50%	30%	50%	50%	30%
Question 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2
Societal surplus	0.2	0	0	0.1	0.5	0.3	0.5	0.2	0.3	0	0.3	0.3

(continued on next page)

Table 13 (*continued*)

	Block 1		Block 2		Block 3		Block 4		Block 5		Block 6	
Share accruing to women	60%	50%	50%	40%	40%	50%	40%	50%	60%	50%	50%	40%
Share accruing to men	40%	50%	50%	60%	60%	50%	60%	50%	40%	50%	50%	60%
Share accruing to low-income earners	70%	50%	30%	50%	60%	70%	30%	50%	70%	50%	30%	50%
Share accruing to high-income earners	30%	50%	70%	50%	40%	30%	70%	50%	30%	50%	70%	50%
Question 3	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2	Alt 1	Alt 2
Societal surplus	0	0.4	0.2	0	0.4	0.2	0.4	0.3	0.5	0.2	0.4	0.5
Share accruing to women	50%	40%	60%	50%	40%	50%	40%	50%	40%	50%	60%	50%
Share accruing to men	50%	60%	40%	50%	60%	50%	60%	50%	60%	50%	40%	50%
Share accruing to low-income earners	50%	70%	30%	50%	30%	50%	50%	70%	70%	50%	50%	70%
Share accruing to high-income earners	50%	30%	70%	50%	70%	50%	50%	30%	30%	50%	50%	30%

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