Individuals' socioeconomic position, inequality perceptions, and redistributive preferences in OECD countries

Gwangeun Choi[1]

Abstract

The standard model of redistribution posits that attitudes towards redistribution are driven by pure economic self-interest, such as current income. From a social-psychological perspective, however, subjective social status, apart from objective income or social status, is also closely associated with policy preferences. This inquiry directly compares these two different approaches and further explores the role of individuals' inequality perceptions, including personal norms of inequality to which researchers have paid little attention so far, in shaping individuals' preferences for redistribution. The current evidence shows that the explanatory power of objective income position is not stronger than that of subjective social position in determining redistributive preferences, while objective social position, which is a summary measure of income, education, and occupation, is more strongly associated with the preferences than perceived social position. The results also demonstrate that individuals' inequality norms play a more crucial role in the preference formation than does their perceptions of actual inequality. These new findings contribute to redistributive politics and behavioural economics on other-regarding preferences, first, by rebutting the determining role of objective income position in shaping redistributive preferences, as opposed to the basic assumption of the conventional redistribution hypothesis; second, by providing the empirical evidence of the importance of social preferences outside the field of experimental studies.

Keywords Melter-Richard model · Redistributive preferences · Objective income position · Objective social position · Perceived social position · Perceived actual inequality · Personal norms of inequality · Perceived injustice

✉ Gwangeun Choi
  gwangeun@gmail.com

[1] Goyang-si, South Korea

1 Introduction

Is pure economic self-interest the only decisive factor that drives individuals' preferences for redistribution? What if this self-interest is only one of the driving factors—not the most significant one—that shape preferences for redistribution? The empirical answer to these questions has important theoretical implications. According to the basic assumption of the standard model of redistribution, which is a generalised term of the Meltzer-Richard model, objective income position dictates demand for redistribution (Meltzer and Richard 1981, p. 924). If this is not the case, however, the cornerstone of the Meltzer-Richard model would be undermined.

In empirical studies, the standard redistribution model generally assumes a close association between actual economic inequality and redistribution through demand for redistribution at the macro level. However, much of the literature analysing the relationship between inequality and redistribution ignores preferences for redistribution or even identify these preferences with redistribution. If we focus on redistributive preferences, leaving aside whether or not the collective preferences translate into redistribution, it is possible to analyse, at least, the mechanism or assumption of the Meltzer-Richard model at the individual level. In cross-national survey research, there are numerous studies examining the determinants of redistributive preferences at the micro level; however, their findings show that objective income position is just one of the significant predictors. This evidence does not say anything about the validity of the dominance of actual income position in forming redistributive preferences.

Meanwhile, cross-national comparative studies have shown that there exist widespread misperceptions of income position or inequality and a substantial gap between perceived inequality and actual inequality.[1] Researchers have also demonstrated that perceived inequality rather than actual inequality plays a critical role in shaping attitudes towards redistribution (e.g. Choi 2019; Gimpelson and Treisman 2018). This empirical evidence leads us to re-examine the classical redistribution model and its fundamental assumption by taking individuals' subjective social position and inequality perceptions into account.

Taken all together, the gap in the literature in terms of the driving factors of redistributive preferences can be summarised as a lack of both testing the dominant explanatory power of objective income position and exploring individuals' multifaceted perceptions of inequality. To fill this gap, this inquiry investigates two main points. First, we question whether or not an individual's objective income location is the most decisive predictor of preferences for redistribution, as predicted by the basic assumption of the Meltzer-Richard model. For the purpose of doing this, the effect sizes of objective income position and subjective social position are directly compared; instead of objective income position, objective social position is also considered. Second, in addition to income or social position, the impacts of inequality

---

[1] In addition to several studies that have systematically tested whether the gap exists through cross-national comparisons (e.g. Bublitz 2016; Engelhardt and Wagener 2014; Gimpelson and Treisman 2018; Kuhn 2015b; Niehues 2014), there are several studies examining Americans' perceptions of inequality (Chambers et al. 2014; Eriksson and Simpson 2012; Norton and Ariely 2011; Osberg and Smeeding 2006). Even prior to these studies, there were some papers pointing out that contextual inequality, such as income inequality, does not directly translate into perceptions of inequality (see Neckerman and Torche 2007, pp. 349–350). Beramendi and Anderson (2008, pp. 405–408) also cast doubt on the assumption that people perceive actual inequality accurately, on which the conventional political economy of inequality and redistribution is based. Furthermore, a multitude of randomised survey experiments have provided considerable evidence that correcting misperceptions of an individual's income position or society-level inequality has an important impact on changing attitudes towards redistribution (e.g. Cruces et al. 2013; Karadja et al. 2014; Kuziemko et al. 2015).

perceptions on individuals' preferences for redistribution are investigated; to this end, new measures of inequality perceptions, named perceived actual inequality, personal norms of inequality, and perceived injustice, were developed.[2]

The current empirical results support the following claims. First, the impact of objective income position is not stronger than that of subjective social position in determining redistributive preferences; that is, perceived social position is as influential as objective income position. Second, objective social position is more closely associated with support for redistribution than perceived social position. Previous cross-national comparative studies, to my knowledge, have not examined the relative explanatory powers between these socioeconomic positions.[3] Third, the effect of personal norms of inequality on preferences for redistribution is significantly stronger than that of perceived actual inequality, which is also a new finding. Fourth, perceived injustice that can be measured as a gap between perceived actual inequality and personal norms of inequality is closely related to individuals' redistributive preferences. Last, perceived inequality at the country level, rather than market inequality, plays an important role in shaping individuals' preferences for redistribution.

The remainder of this paper is organised as follows. The second section reviews the determinants of redistributive preferences. In the third section, socioeconomic position and inequality perception hypotheses are formulated. Subsequently, the measures of individuals' redistributive preferences, socioeconomic position, and inequality perceptions are explained. The next section summarises the findings of the empirical analyses based on the international survey data covering 31 OECD countries (see Table 8 in the Appendix). The last section discusses the remaining issues and concludes the article.

2 Socioeconomic position, inequality perceptions, and redistributive preferences

Ever since we observed that people behave in ways that are contrary to their material self-interest in many contexts, behavioural economics has been challenging neoclassical economics and finding the importance of other-regarding or social preferences, such as fairness, reciprocity, and equity. This research has been advanced by experimental studies (e.g. Güth et al. 1982; Roth et al. 1991), and one of the hot topics in this research is redistributive politics. There is also survey evidence that those who believe that the poor work hard and that poverty is beyond the control of the poor tend to support redistribution, but economic self-interest, such as actual income, is a relatively poor predictor for redistributive preferences, albeit in the American context (Fong 2001).[4] These effects of self- and exogenous-determination beliefs on support for redistribution can be understood as reflecting reciprocity (Bowles and Gintis 2000) or the principle of equity (Kluegel and Smith 1986).

---

[2] The conceptual and empirical framework of Kuhn (2011, 2015a, 2015b) and Osberg and Smeeding (2006) is similar to the current framework, but this study constructed the new measures that are different from the previous ones, as discussed below.

[3] In this study, individuals' objective income or social position and perceived social position are collectively called individual's socioeconomic position.

[4] Fong (2001) showed that the marginal effects of annual household income between an income of $150,000 or more and an income of less than $10,000 are smaller than the marginal effects of the self- and exogenous-determination beliefs.

Nevertheless, many scholars still defend the median voter model of redistribution under the assumption that economic self-interest is a decisive driver for redistributive preferences. Without considering social preferences, however, it is difficult to explain why there is substantial support for redistribution even amongst high-income individuals in many surveys. The significance of social preferences suggests the value of a broader search for driving factors inconsistent with the standard redistribution model.

In a framework of the standard redistribution model, in fact, public opinion towards redistribution plays a decisive role in determining redistribution (e.g. Cusack et al. 2008; Meltzer and Richard 1981; Kelly and Enns 2010; Kenworthy and McCall 2008). In principle, testing the standard model requires collective redistributive preferences as an intervening factor between economic inequality and redistribution (Choi 2019). If we take the preferences into account, not only country-level analyses but also individual-level analyses can be conducted. Apart from how responsive policy outcomes are to policy preferences, how society-level inequality shapes individuals' preferences for redistribution can be explored in a macro analysis. On the other hand, a micro analysis can estimate the effects of both individuals' socioeconomic status and perceptions of inequality on their preferences for redistribution. One caveat is that conducting this micro-level analysis should not be confused with testing the redistribution model itself. This analysis relates exactly to examining either the foundational assumption of the redistribution model or an individual-level mechanism of the model.

Unlike the studies questioning the median voter model of redistribution and predicting the poor performance of economic self-interest discussed above, most of the existing cross-national survey research shows that objective income position is still one of the significant predictors for redistributive preferences; however, no researchers have directly examined the effect size of objective income location in comparison with that of subjective social position, as can be seen in Table 1.[5]

Finseraas (2009, p. 96) stated that the finding that demand for redistribution decreases with income is in accord with the Meltzer-Richard model. To be exact, however, this evidence demonstrates neither the validity of the basic assumption of the model nor that of the model itself; this robust finding is nothing more than that income is one of the driving factors of redistributive preferences. Furthermore, Alesina and Giuliano (2011, p. 105) argued that the rejections of the Meltzer-Richard model, because of scant empirical support at the country level, 'do not imply immediately that people care about something other than their current income'; however, this argument has not been fully examined in the existing literature.

On the other hand, McCarty and Pontusson (2009, p. 672) cast doubt on the underlying assumption of the Meltzer-Richard model that '[voters'] preferences can be inferred straightforwardly from their position in the income distribution' and claimed that this questionable assumption may contribute to the failure of the model. Brown-Iannuzzi et al.'s (2015) presented correlational evidence that subjective social status is negatively associated with support for redistribution, while objective social status,[6] such as income and education, has no

---

[5] Guillaud (2013) considered both family income and perceived social class as independent variables, but the interpretation of the categorical variables estimates is not straightforward. Kim and Lee (2018) included perceived social position and objective social position, which is a composite measure of income, education, and occupation, in their analysis; however, objective income position itself is not considered.

[6] The present study differentiates objective social position from objective income position. Many studies consider education and occupation, in addition to income, as the foundations of objective social status (Lareau and Conley 2008; Wolfe 2015), although some authors define objective social position only with income because it is the most common component of objective social status.

Table 1 The relationship between socioeconomic position and redistributive preferences

Author	Data and sample	Independent variable	Effects on preferences
Alesina and Giuliano (2011)	GSS: US, 1972–2004 WVS: 20–80 countries, 4 waves	family income (min 1–max 12) income (min 1–max 3)	negative negative
Alesina and La Ferrara (2005)	GSS: US, 1978–1991	logarithm of current income	negative
Clark and D'Angelo (2013)	BHPS: UK, 1991–2008	objective social position (occupation) on Hope-Goldthorpe scale	negative
Corneo and Grüner (2002)	ISSP: 12 countries, 1992	individual gross income	negative
Dallinger (2010)	ISSP: 23 countries, 1999	household income (deciles 1–10)	negative
Fatke (2018)	ISSP: 27 countries, 3 waves (1992, 1999, and 2009)	perceived social position (min 1–max 10)	negative
Finseraas (2009)	ESS: 22 countries, 2002	household income (min 1–max 12)	negative
Guillaud (2013)	ISSP: 33 countries, 2006	family income (quintiles 1–5) perceived social class (lower, middle, upper)	negative in part negative[a]
Karabarbounis (2011)	WVS: 14 OECD countries, 1981–2004	household income (min 1–max 10)	negative
Kim and Lee (2018)	ISSP: 28 countries, 2009	objective social position (min -1.95–max 6.95)[b] perceived social position (min 1–max 10)	negative negative
Mosimann and Pontusson (2014)	ESS: 19 countries, 3 waves (2008, 2010, and 2012)	relative household income (min 1–max 10)	negative
Rainer and Siedler (2008)	SOEP: Germany, 2005	logarithm of household income	negative
Steele (2015)	ISSP: 38 countries, 2009	income (mean-centred country-specific deciles)	negative

Notes: BHPS (British Household Panel Survey); ESS (European Social Survey); GSS (General Social Survey); ISSP (International Social Survey Programme); SOEP (German Socio-Economic Panel); WVS (World Values Survey). [a] The upper class are significantly less inclined to favour redistribution than the middle class, but the effect of the lower class is not significant. [b] This variable is a composite measure of occupation, education, and family income.

relationship with the support.[7] Meanwhile, Bolton (1991) formalised the idea that individuals are concerned about not only absolute income they get but also their relative income position compared with others.[8]

In fact, people do not construct attitudes towards policies simply by following their economic self-interest (e.g. Fong 2001), although it cannot be denied that the preference gap of redistribution between income groups is not negligible (e.g. Peters and Ensink 2015; Soroka and Wlezien 2008; see also studies in Table 1). It is thus reasonable to assume that other cognitive factors, such as perceived social position and inequality perceptions, which diverge from pure economic self-interest, also play a role in shaping preferences for redistribution. However, previous cross-national comparative research has not provided information about

---

[7] Their experimental study conducted a simple regression analysis to explore the relationship with the sample of 135 participants.
[8] The present study sees objective income position as an absolute and objective measure of self-interest, while perceived social position is considered a relative and subjective measure of self-interest.

the relative importance of objective income position in terms of its explanatory power for redistributive preferences.

Unlike individuals' socioeconomic position and society-level inequality, it is challenging work to conceptualise and measure individuals' inequality perceptions. However, we may ask questions as follows: How unequal a society is perceived and how unequal a society should be. In fact, perceived inequality has mostly been construed as perceptions of actual inequality in existing studies; few investigators, on the other hand, have focussed on personal norms of inequality that can be defined as perceptions of how much inequality is desirable in a society. Kuhn's (2011, 2015a, 2015b) work might be an exception, but he mainly examined the effects of perceptions of actual inequality rather than personal norms of inequality. Individuals have subjective perceptions of norms, which appear to be distinct from perceptions of reality, and the former 'can guide individuals' opinions and behaviors' (Tankard and Paluck 2016, p. 182). However, this presumption has not been robustly tested in previous studies.

Regarding the determinants of individuals' preferences for redistribution, numerous studies exist (e.g. Cusack et al. 2008; Fong 2001; Rueda 2014; see more studies in Tables 1 and 2; see also McCarty and Pontusson 2009, pp. 680–687 for a summary of the important literature). However, much of the literature does not directly address inequality perceptions, although many studies consider psychological factors, such as experience or expectation of upward mobility (e.g. Benabou and Ok 2001; Piketty 1995).[9] Table 2 shows recent research focussing on either perceived inequality or actual inequality as an explanatory variable. Fatke (2018), Kuhn (2011, 2015a, 2015b), and Gimpelson and Treisman (2018) employed perceived inequality measures, and the rest of the researchers mostly used net inequality as a contextual variable. Overall, the findings show that individuals' preferences for redistribution are closely related to perceived inequality, while net inequality is not consistently associated with redistributive preferences.

There is also a measurement issue that cannot be overlooked. In Table 2, net inequality is commonly used as a contextual variable that may affect individuals' redistributive preferences; however, the standard redistribution model refers to market income inequality, not disposable or net income inequality (Finseraas 2009, p. 101; Schmidt-Catran 2016, p. 127). From the perspective of the standard model, net inequality after taxes and transfers cannot be an explanatory variable. In advanced democracies, it is more problematic because the gap between market inequality and net inequality is sizable. Accordingly, the effect of market inequality, instead of net inequality, was tested for the present analysis.

In sum, subjective factors in terms of social position and inequality have recently started attracting attention in the literature of preferences for redistribution, but their significance has not been closely investigated. Furthermore, regarding the basic assumption of the Meltzer-Richard model, whether or not the role of objective income position is dominant has not been explored in the existing literature. Underdeveloped measures of inequality perceptions also hinder the empirical analysis from advancing. Perceived inequality measures in Table 2 are critically discussed in more detail below, followed by a discussion of alternative measures, after the presentation of the main hypotheses.

---

[9] In a broad sense, perceived upward mobility might also be a form of inequality perceptions in terms of inequality of opportunity, but the current inquiry focusses on perceived inequality of outcome, such as income or social position, rather than perceived inequality of opportunity.

Table 2 The relationship between inequality and redistributive preferences

Author	Data and sample	Independent variable	Effects on preferences
		perceived inequality	
Fatke (2018)	ISSP: 27 countries, 3 waves (1992, 1999, and 2009)	perceived Gini (country average)[a]	positive
Gimpelson and Treisman (2018)	ISSP: 40 countries, 2009	perceived Gini (individual) perceived Gini (country average)[b]	positive positive
Kuhn (2011)	ISSP: Switzerland, 1999	actual inequality ethical inequality equalisation of market wages[c]	positive negative positive
Kuhn (2015a, 2015b)	ISSP: 27 countries (2015a)/23 countries (2015b), 4 waves (1987, 1992, 1999, and 2009)	inequality perception[d]	positive
		actual inequality	
Dallinger (2010)	ISSP: 23 countries, 1999	net inequality	positive
Fatke (2018)	ISSP: 27 countries, 3 waves (1992, 1999, and 2009)	net inequality	not significant
Finseraas (2009)	ESS: 22 countries, 2002	net inequality	positive
Jæger (2013)	ESS: 31 countries, 5 waves (2002–2010)	inequality[e]	positive[f]
Kerr (2014)	ISSP: 19 countries, 3 waves (1987, 1992, and 1999)	net inequality	positive
	WVS: 37 countries, 3 waves (1990, 1995, and 2000)	net inequality	positive
	GSS: US, 2000	net inequality	positive
Kuhn (2015b)	ISSP: 23 countries, 4 waves (1987, 1992, 1999, and 2009)	net inequality	not significant
Mosimann and Pontusson (2014)	ESS: 19 countries, 3 waves (2008–2012)	net inequality	positive
Schmidt-Catran (2016)	ESS: 27 countries, 5 waves (2002–2010)	net inequality	positive
Steele (2015)	ISSP: 38 countries, 2009	net inequality	not significant
Tóth and Keller (2011)	EB: 27 countries, 2009	net inequality	positive

Notes: EB (Eurobarometer); ESS (European Social Survey); GSS (General Social Survey); ISSP (International Social Survey Programme); WVS (World Values Survey). [a] Fatke (2018) constructed this measure by following Niehues' (2014) method, which is slightly different from Gimpelson and Treisman's (2018) approach. [b] These indicators were constructed by using Question G in Table 6 of the Appendix, and they are different from the perceived Gini from Choi (2019) in the current analysis. [c] These variables are individual perceptions of wage inequality measures. [d] This measure was constructed in the same manner as actual inequality in Kuhn (2011). [e] Gini (WIID) not specified. [f] At the level of 27 socio-demographic groups across education, social class, and age.

3 Socioeconomic position and inequality perception hypotheses

The main hypotheses address, first, the association between individuals' socioeconomic position and redistributive preferences and second, the relationship between individuals' inequality perceptions and redistributive preferences. It is generally expected that both socio-economic location and perceptions of inequality would matter in shaping preferences for redistribution. However, this inquiry goes one step further and hypothesises the relationships,

first, by differentiating objective income or social position from subjective social position and second, by classifying inequality perceptions into three different dimensions: perceived actual inequality, personal norms of inequality, and perceived injustice.

3.1 Socioeconomic position hypothesis

Hypothesis 1: Because perception of reality matters more than reality itself in shaping individuals' redistributive preferences, perceived social position will better explain variations in the preferences than objective income or social position.

Hypothesis 1 states that subjective social status will be a better predictor of individuals' preferences for redistribution than objective income or social status. The assumption that support for redistribution may not be just a function of objective socioeconomic status, as opposed to the basic assumption of the Meltzer-Richard model, led to this hypothesis. From a social-psychological perspective, it is plausible that those who think that their social position is located at a lower level, regardless of their actual income or social position, are more likely to demand redistribution than people who locate their social position at a higher level. In other words, an individual's social position based on self-assessment may play a more significant role in forming redistributive preferences than the individual's actual income or social position.

3.2 Inequality perception hypotheses

Hypothesis 2: Perceived actual inequality will positively and significantly affect individuals' redistributive preferences.
Hypothesis 3: Personal norms of inequality will negatively and significantly affect individuals' redistributive preferences.
Hypothesis 4: Perceived injustice will positively and significantly affect individuals' redistributive preferences.

Hypothesis 2 assumes that the more unequal people find their society with respect to the actual level of inequality, the greater redistribution they demand. It is highly likely that individuals who think the level of inequality is serious and unacceptable, irrespective of the level of actual inequality, desire more redistribution. That is, how much inequality is perceived rather than how much inequality exists is predicted to determine preferences for redistribution (Eriksson and Simpson 2012, p. 741). *Hypothesis 3* states that the higher an individual's inequality norms are, the less redistribution the individual supports. In other words, people who think that a more unequal society is desirable are expected to oppose more redistribution.

Hypothesis 4 is derived from the previous hypotheses combined. If the cognitive gap between perceived actual inequality and personal norms of inequality that an individual perceives widens, the individual may be more likely to support redistribution to reduce the perceived differential between the reality and the ideal. In fact, this measure was directly inspired by Sen's (2000, p. 60) argument that 'people's attitudes towards, or reactions to, actual income distributions can be significantly influenced by the correspondence—or the lack thereof—between (1) their ideas of what is normatively tolerable, and (2) what they actually see in the society around them'. Additionally, according to Whitmeyer (2004), this indicator may be an application of Jasso's justice theory.

With respect to control variables at the individual level, age, sex, and union membership were used for the analyses. Age and sex are expected to be associated with redistributive preferences; thus, these individual-level controls are widely present in the literature. It is also assumed that union members would considerably more supportive of redistribution than those who are non-union members (Mosimann and Pontusson 2014; Rueda 2014).

Finally, there are contextual variables: market inequality, perceived inequality, economic development, economic growth, and ethnic fractionalisation. From the distribution of perceived social position in a country, we can estimate the inequality structure as a contextual factor that may condition individuals' preferences for redistribution (Choi 2019); it can thus be hypothesised that an individual is more likely to support redistribution in a country that has a more unequal distribution of perceived social position. Similarly, the level of market inequality is predicted to influence individuals' redistributive preferences, which might be inferred from the standard model of redistribution. Economic development and economic growth are expected to create a more favourable environment for an individual to support redistribution. Ethnic fractionalisation is also included as a control since there is empirical evidence that ethnic diversity negatively affects support for redistribution (Alesina and Glaeser 2004, pp. 133–181; Dahlberg et al. 2012).

4 Measurement and data

4.1 Redistributive preferences

Redistributive preferences as a dependent variable are defined as the degree of respondents' agreement to the question of the government's responsibility for reducing income differences, which is the most widely used measure of redistributive preferences in empirical studies.[10] This question is found in the various international surveys, such as the International Social Survey Programme (ISSP), the Comparative Study of Electoral Systems (CSES), and the European Social Survey (ESS). There are two alternative dependent variables, however, based on the same survey question (see Question A in Table 6 of the Appendix). One is a dichotomous variable in which 1 is assigned to the answers 'strongly agree' or 'agree', while 0 is assigned to the answers 'neither agree nor disagree', 'disagree', or 'strongly disagree'. The other is an ordinal variable that has five original categories from 'strongly disagree' (1) to 'strongly agree' (5). The data came from the ISSP Social Inequality modules (1987, 1992, 1999, and 2009) (ISSP Research Group 2016) because of data availability for the main explanatory variables.

4.2 Individuals' socioeconomic position and inequality perceptions

Perceived social position is a variable standardised for each country-year that is based on an ordinal indicator from respondents' self-positioning on a bottom-to-top (one to ten) scale (see Question C in Table 6 of the Appendix); the data were collected from the ISSP Social

---

[10] Alternatively, Tóth and Keller (2011) developed a composite index, the Redistributive Preference Index (RPI), based on five categorical variables about fair redistribution, job provision, free education, social spending, and governments' responsibility in the 2009 special Eurobarometer survey on poverty and social exclusion. However, this measure captures an overly broad notion of redistributive preferences, and its coverage is relatively limited. Consequently, this index was not employed in the current study.

Inequality modules. Objective income position is also a variable standardised for each country-year that is based on an ordinal indicator from respondents' actual household income before taxes and other deductions;[11] the data came from the ISSP Social Inequality modules. Amongst the modules, ISSP 1999 is the only module that provides a variable of harmonised income categories across countries,[12] enabling not only cross-national comparative analysis but also an intuitive direct comparison with perceived social position without standardisation in each country-year, as both variables have the same metric (one to ten). These unstandardised variables of objective income position and perceived social position are used in Table 9 of the Appendix.

Objective social position is a summary measure of household income, education, and occupation, which are the three traditional components of socioeconomic status, following the approach used by Adler et al. (2000). Objective income position above is used for household income standardised by country-year. Education and occupation are variables standardised for each country-year, which are based on the variables of education and occupation categories, respectively, from the ISSP Social Inequality modules.[13] The composite indicator of objective social position was created by averaging the three components and then standardising the mean values by country-year.

As for inequality perceptions, diverse ways to measure the perceptions have been developed so far in the literature, but there is understandably no consensus on how to operationalise and measure them since perceptions of inequality might be understood in various ways. We can conceive a variety of methods to estimate the way in which individuals perceive inequality in their society. It is thus necessary to clarify the types of inequality perceptions in the first place. Table 3 shows the different dimensions of inequality perceptions considered in the present study. Unlike actual inequality based on the overall distribution of individuals' material condition, such as income, individuals can have their own perceptions of inequality. These perceptions are not necessarily restricted to perceptions of reality. We can also conceptualise not only how unequal a society should be (perception of norms) but also how fair the level of inequality is (perception of injustice).

The measures of perceived actual inequality and personal norms of inequality are continuous ones, not categorical variables, based on wage estimates across different

---

[11] In a strict sense, the objectivity of self-reported income might be open to question. However, the raw variable is measured in absolute terms rather than in relative terms. In this respect, the variable of objective income position is clearly distinguishable from that of perceived social position. Similarly, Brown-Iannuzzi et al. (2015) define self-reported income or self-rated education as a measure of objective socioeconomic status, whereas they regard "Perception of where one stands in relation to others" (p. 16) as an indicator of subjective socioeconomic status (see also Kim and Lee 2018).

[12] The ISSP Social Inequality modules (1987, 1992, 1999, and 2009) have a household income variable that indicates the amount of household income self-reported, and these modules mostly provide variables showing *ex post* income brackets into which a respondent's self-reported income is classified. In ISSP 1987, 1992, and 2009, however, these income brackets are country-specific; that is, they are not comparable across countries. Meanwhile, ISSP 1999 presents a variable of harmonised income categories (*incomer*) that has a scale of one to ten in every country; nation-specific codes and value labels are found in the ISSP 1999 Variable Note 2.

[13] Education and occupation categories employed in the modules are not consistent across waves and countries; thus, it is essential to standardise each indicator by country-year before aggregating them. Education was originally measured by the highest level of education completed ranging from no formal qualifications (0) to university degree (5) in ISSP 2009, for instance. Occupation was originally coded into four categories, using 10 occupational groups classified by Erikson et al. (1979): (1) semi- and unskilled workers, (2) skilled workers, (3) middle class, and (4) service class. To produce the 10 occupation categories, the variables of the International Standard Classification of Occupations (4-digit ISCO-68 and ISCO-88) were recoded, using *iscogen*, which is a Stata module to translate ISCO codes.

Table 3 Dimensions of inequality perceptions

	Perception of reality	Perception of norms	Perception of injustice
Individual level	• perceived actual inequality • perceived society type	• personal norms of inequality	• perceived injustice • perceived income differences
Country level	• perceived Gini		

occupations, as shown in Table 4. Additionally, the gap between perceived actual inequality and personal norms of inequality was measured to assess the level of perceived injustice. In fact, this approach used for this inquiry to develop the three inequality perception measures is not new. Kuhn (2011, 2015a, 2015b) employed a similar method using top and bottom groups' wage estimates, but he tried to formulate individual-level Gini coefficients with the relative size of the bottom group and its wage share based on subjective wage estimates for different occupations.[14] However, the measures developed by Kuhn have some drawbacks. For instance, some subjective Gini coefficients have negative values, which go beyond the range of the conventional Gini coefficients; more fundamentally, a very small number of specific occupations employed cannot be a basis for estimating the distribution of the whole population in a country that is necessary to calculate the Gini coefficient.

Accordingly, a more reasonable approach is simply to calculate the ratio of the level of wage estimates at the top to the level of wage estimates at the bottom, which is analogous to the percentile-ratio inequality measures in the actual income distribution. However, due to the highly skewed nature of the original ratios of those estimates, their logarithmic transformation was used, following Schneider's (2012) approach.[15] To produce the measures, the top group consists of these three occupations: a doctor in general practice, a cabinet minister in the national government, and the chairman of a large national company. The bottom group is an unskilled worker in a factory. We selected these four occupations to maximise comparability because these occupations appear consistently in all four rounds of the survey: ISSP 1987, 1992, 1999, and 2009. Consequently, perceived actual inequality, personal norms of inequality, and perceived injustice were computed as follows:

$$perceived\ actual\ inequality\ \left(Inequality_i^{actual}\right) = \ln\left(\frac{subjective\ estimate\ of\ actual\ wage\ for\ top\ group}{subjective\ estimate\ of\ actual\ wage\ for\ bottom\ group}\right)$$

$$= \ln\left(\frac{\frac{1}{3}\left(y_{actual}^{doctor} + y_{actual}^{minister} + y_{actual}^{chairman}\right)}{y_{actual}^{unskilled}}\right)$$

$$personal\ norms\ of\ inequality\ \left(Inequality_i^{norm}\right) = \ln\left(\frac{subjective\ norm\ of\ wage\ for\ top\ group}{subjective\ norm\ of\ wage\ for\ bottom\ group}\right)$$

---

[14] Kuhn's framework is in line with Osberg and Smeeding's (2006) method in the sense that they also tried to calculate individuals' subjective Gini coefficients, but their assumption is simpler and more problematic than Kuhn's—that there is an equal number of people in each occupation.

[15] Schneider's (2012) measures are based on Jasso's (2007) logarithmic-ratio specification of the justice evaluation function in which the actual reward is compared with the just reward.

Table 4 The measures of individuals' inequality perceptions

Variable	Definition	Source
perceived actual inequality	subjective estimate of actual wage for top group divided by that of bottom group (see Question D in Table 6 of the Appendix)	ISSP 1987, 1992, 1999, and 2009
personal norms of inequality	personal norms of wage for top group divided by that of bottom group (see Question E in Table 6 of the Appendix)	ISSP 1987, 1992, 1999, and 2009
perceived injustice	discrepancy between perceived actual inequality and personal norms of inequality	ISSP 1987, 1992, 1999, and 2009
perceived income differences	answer to the question of whether differences in income are too large (see Question F in Table 6 of the Appendix)	ISSP 1987, 1992, 1999, and 2009
perceived society type	diagram that best describes a society (see Question G in Table 6 of the Appendix)	ISSP 1992, 1999, and 2009

$$= \ln \left(\frac{\frac{1}{3} \left(y_{norm}^{doctor} + y_{norm}^{minister} + y_{norm}^{chairman} \right)}{y_{norm}^{unskilled}} \right)$$

$$perceived\ injustice\ (Injustice_i) = Inequality_i^{actual} - Inequality_i^{norm}$$

The estimated values of perceived actual inequality are always positive because there is no one who thinks that the top group's wage is less than or equal to the bottom group's wage. The values of personal norms of inequality are mostly positive, but there exists a value of zero if a respondent supports absolute equality in which there is no difference in wages between top and bottom groups.[16] With respect to the values of perceived injustice, a value of zero indicates that wage justice is assessed as being perfect, as an individual's perception of the reality is identical with that of the ideal. When a respondent judges that the level of perceived inequality is lower than it should be, the sign of perceived injustice is negative, whereas when a respondent judges that the level of perceived inequality is higher than it should be, perceived injustice has a positive sign. In the main analyses, however, these inequality perception measures are standardised for each country-year to make comparisons easier.

Additionally, there are two more measures of inequality perceptions at the individual level: perceived income differences and perceived society type. The former is based on the response about the degree of income differences in a country (see Question F in Table 6 of the Appendix), which assesses fairness of income distribution by implicitly capturing a disparity between perceived reality and perceived norms, although its scale is too rough. In this respect, this indicator can be classified as a measure in the domain of injustice perception in Table 3. This individual-level measure is an ordinal variable that has five categories, from 'strongly disagree' (1) to 'strongly agree' (5). The data were taken from the ISSP Social Inequality modules. However, this variable is highly correlated to the redistributive preferences variables;

---

[16] Of the respondents in 31 OECD countries in ISSP 1987, 1992, 1999, and 2009, 989 out of 77,555 (1.28%) favoured absolute wage equality.

Table 5 The effects of socioeconomic position and inequality perceptions on redistributive preferences

	redistributive preferences (binary)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Perceived actual inequality	0.374 (0.028)***	0.347 (0.032)***	0.347 (0.032)***				0.380 (0.028)***	0.355 (0.032)***	0.355 (0.032)***
Personal norms of inequality	-0.558 (0.031)***	-0.509 (0.034)***	-0.509 (0.034)***				-0.576 (0.032)***	-0.517 (0.033)***	-0.517 (0.034)***
Perceived Injustice				0.424 (0.028)***	0.388 (0.029)***	0.388 (0.029)***			
Perceived social position	-0.259 (0.017)***	-0.223 (0.022)***	-0.234 (0.022)***	-0.264 (0.017)***	-0.225 (0.022)***	-0.236 (0.022)***	-0.272 (0.015)***	-0.227 (0.020)***	-0.236 (0.020)***
Objective income position	-0.278 (0.016)***	-0.209 (0.020)***		-0.293 (0.017)***	-0.220 (0.021)***		-0.274 (0.017)***	-0.212 (0.021)***	
Education		-0.116 (0.026)***			-0.124 (0.028)***			-0.121 (0.024)***	
Occupation		-0.081 (0.019)***			-0.094 (0.020)***			-0.103 (0.020)***	
Objective social position			-0.298 (0.021)***			-0.322 (0.023)***			-0.321 (0.020)***
Individual controls	No	No	No	No	No	No	Yes	Yes	Yes
Country controls	No	No	No	No	No	No	No	No	No
Country-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R-squared	0.150	0.151	0.150	0.145	0.146	0.145	0.158	0.159	0.158
Observations	59,763	36,098	36,098	59,763	36,098	36,098	52,989	33,457	33,457
Clusters	68	50	50	68	50	50	67	50	50

Table 5 (continued)

	redistributive preferences (binary)								
	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Perceived actual inequality				0.344 (0.027)***	0.329 (0.032)***	0.328 (0.032)***			
Personal norms of inequality				-0.526 (0.031)***	-0.479 (0.033)***	-0.480 (0.034)***			
Perceived Injustice	0.434 (0.028)***	0.396 (0.027)***	0.396 (0.028)***				0.405 (0.028)***	0.374 (0.029)***	0.374 (0.029)***
Perceived social position	-0.278 (0.015)***	-0.228 (0.020)***	-0.237 (0.020)***	-0.259 (0.016)***	-0.213 (0.019)***	-0.226 (0.020)***	-0.264 (0.016)***	-0.214 (0.020)***	-0.227 (0.021)***
Objective income position	-0.296 (0.018)***	-0.227 (0.022)***		-0.254 (0.017)***	-0.201 (0.021)***		-0.275 (0.018)***	-0.215 (0.022)***	
Education		-0.135 (0.026)***			-0.106 (0.025)***			-0.121 (0.026)***	
Occupation		-0.114 (0.020)***			-0.106 (0.020)***			-0.115 (0.020)***	
Objective social position			-0.350 (0.022)***			-0.294 (0.018)***			-0.323 (0.021)***
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country controls	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	Yes	Yes	Yes	No	No	No	No	No	No
Pseudo R-squared	0.152	0.155	0.154	0.105	0.116	0.115	0.100	0.112	0.111
Observations	52,989	33,457	33,457	51,545	32,693	32,693	51,545	32,693	32,693
Clusters	67	50	50	65	49	49	65	49	49

Notes: Entries are logistic regression coefficients with robust standard errors clustered by country-year in parentheses; the constant terms are not reported. Individual controls include age, sex, and union membership; and country controls include market Gini, perceived Gini, economic development, economic growth, and ethnic fractionalisation. * significant at 5%; ** significant at 1%; *** significant at 0.1%.

thus, it is not used in the main analyses.[17] Perceived society type is also an ordinal variable based on selecting a type of society that best describes a society (see Question G in Table 6 of the Appendix), and the data came from the ISSP Social Inequality modules. However, this measure is also not included in the main analyses because it has critical limitations that Type E in the survey question is not distinctive from Type D in terms of the level of inequality.[18] In Table 3, furthermore, there is a country-level measure, the perceived Gini, which is short for the Gini coefficient of perceived social position.[19] This measure was estimated in the same way as calculating the Gini coefficient using the distribution of income.[20]

4.3 Control variables

As for the individual-level control variables, age, sex, and union membership were gathered from the ISSP Social Inequality modules. Regarding the country-level controls, the market Gini, short for the Gini coefficient of market income, came from the Standardized World Income Inequality Database (SWIID) (Solt 2016). The perceived Gini discussed above was calculated by using the distribution of perceived social position on a bottom-to-top (one to ten) scale; the data were collected from the ISSP Social Inequality modules. Economic development can be measured as the logarithm of real GDP per capita based on prices that are constant across countries and over time, and economic growth refers to the yearly percentage growth rate of real GDP at constant national prices; these two economic controls were produced by using the GDP data from the Penn World Table (Feenstra et al. 2015). Ethnic diversity can be quantified by ethnic fractionalisation that measures the probability that two randomly selected individuals from a population belong to different groups; its maximum value of 1 means that each individual belongs to a different group, whereas the minimum value of 0 means that each individual belongs to the same group; the data were collected from Alesina et al. (2003) and multiplied by 100.

---

[17] Polychoric correlation analysis shows that this measure is highly associated with the variables of redistributive preferences (binary and ordinal) ($r = 0.57$ and 0.62, respectively).

[18] If we calculate the Gini coefficients of each diagram, following Gimpelson and Treisman's (2018) method, the Gini of Type D is 0.20, and the Gini of Type E is 0.21. However, this survey question was designed to clearly differentiate between those five types in terms of where the largest group of people is located in a social hierarchy. What is worse, those who chose Type E showed the second-highest level of aggregate redistributive preferences amongst the five groups. This result implies that respondents saw Type E as unequal as a hypothetical type between Type A and Type B. In sum, this survey question is problematic when used in the context of inequality rather than the majority's social position. The perceived Gini created by Gimpelson and Treisman (2018), which is based on the perceived society type, was therefore not used for the current analysis.

[19] Several previous studies have employed different country-level measures of perceived inequality; however, they have obvious shortcomings. For instance, some measures are simply based on averaging the values of individuals' inequality measures. See Choi (2019) and Schalembier (2015) for a detailed discussion on the country-level measures of perceived inequality.

[20] The perceived Gini was computed, using Question C in Table 6 of the Appendix, as follows: First, the area under the approximated Lorenz curve (A) is calculated by using the properties of a trapezoid from the distribution of perceived social position; second, the area under the Lorenz curve is subtracted from the area under the line of perfect equality (0.5–A); third, the ratio of the area between the line of perfect equality and the Lorenz curve to the area under the line of perfect equality is taken ((0.5–A)/0.5 = 1–2A); and fourth, the perceived Gini employed here is found by multiplying 100 ((1–2A) × 100). See Choi (2019) for more details. Gründler and Köllner (2017) also constructed the Gini coefficient of perceived inequality in the similar way as above.
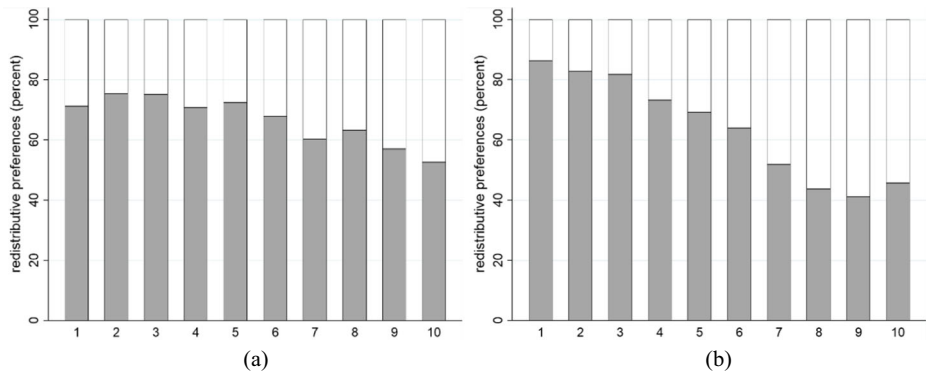
Fig. 1 Individuals' socioeconomic position and redistributive preferences *Notes*: The graphs are based on Questions A, B, and C in Table 6 of the Appendix, using 21,348 observations for 20 OECD countries in ISSP 1999. The 'redistributive preferences' bars represent the percentage of the respondents in favour of redistribution who answered with 'strongly agree' or 'agree' in each category from bottom to top (one to ten) of the income and social position measures above. See Fig. 6 in the Appendix for the country-specific graphs illustrating the relationship between perceived social position and redistributive preferences. (**a**) objective income position. (**b**) perceived social position

5 Analysis and findings

Given the fact that the dependent variable is binary in the primary analysis, the logistic regression was chosen as the baseline modelling framework in estimating each model. In robustness checks, the ordered logistic regression for the alternative dependent variable, which is an ordinal measure of redistributive preferences, was employed; additionally, the multilevel logistic regression to control for contextual effects at the country level was conducted.

Before moving on to the empirical results, Fig. 1 presents graphical evidence that objective income position and subjective social position significantly matter in terms of redistributive preferences. Moreover, the effect of objective income position appears to be slightly weaker than that of perceived social position, as Graph (b) shows a steeper slope than Graph (a). In Table 5, however, the difference between the effect of objective income position and that of perceived social position seems to be negligible, as their interval estimates overlap for the most part.[21] That is, it is highly questionable whether objective income position is the most decisive factor for redistributive preferences.

By contrast, the effect of objective social position is substantively stronger than that of perceived social position in Table 5.[22] For example, Column (9) shows that a one-unit increase in perceived social position leads to about 26.6% decrease in the odds of an individual being in favour of redistribution, and that a one-unit increase in objective social position reduces the odds by 37.8%. We can also check the marginal effects of the variables in Column (9): Increasing perceived social position by one standard deviation, on average, decreases the

---

[21] This is also the case for the standardised coefficients of the variables, which are very close to the unstandardised coefficients in Table 5, because each variable has already been standardised by country-year.

[22] In Columns (3), (6), and (15), the 95% confidence intervals of the two variables slightly overlap; however, the overlaps are far less than about half the average margin of error, which is the criterion for assessing a significant difference between 95% interval estimates (Cumming and Finch 2005; see also Austin and Hux 2002). Meanwhile, this finding contradicts the results from Kim and Lee (2018) that show the negligible difference between the standardised coefficients of objective social position and subjective social position, as their interval estimates mostly overlap.
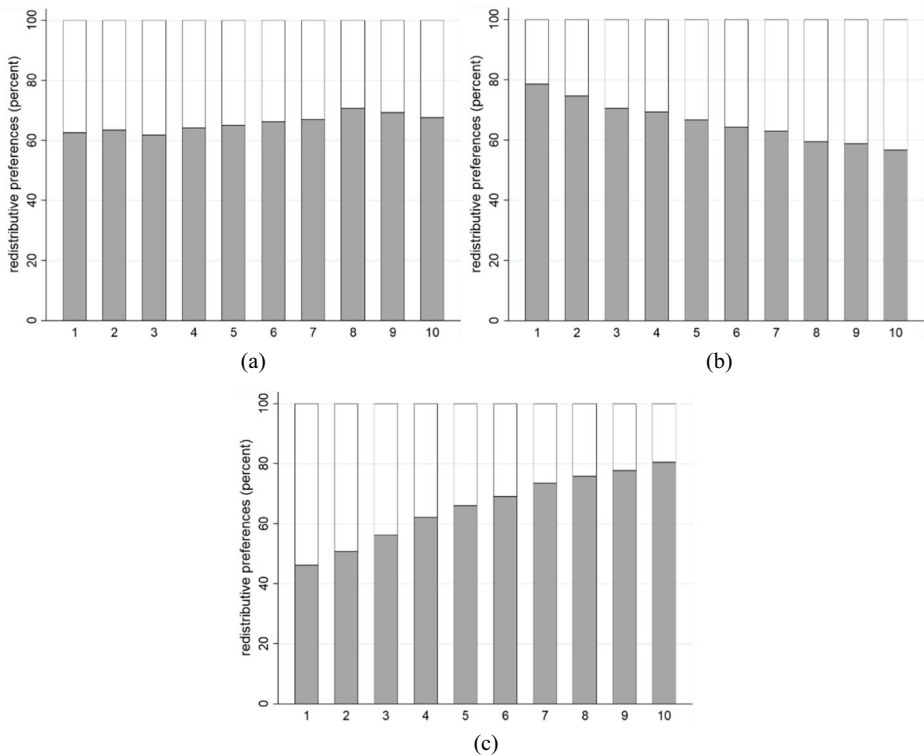
Fig. 2 Individuals' inequality perceptions and redistributive preferences *Notes*: The graphs are based on Questions A, D, and E in Table 6 of the Appendix, using ISSP 1987, 1992, 1999, and 2009 for 31 OECD countries. The observations for Graphs (a), (b), and (c) are 74,547, 75,787, and 71,261, respectively. The 'redistributive preferences' bars represent the percentage of the respondents in favour of redistribution who answered with 'strongly agree' or 'agree' in each decile of the inequality perception measures above. See Fig. 7 in the Appendix for the country-specific graphs illustrating the relationship between personal norms of inequality and redistributive preferences. (**a**) perceived actual inequality deciles. (**b**) personal norms of inequality deciles. (**c**) perceived injustice deciles

probability of supporting redistribution by 4.2%; increasing objective social position by one standard deviation decreases the probability by 5.9%, as shown in Graph (c) of Fig. 3 below.

In addition, Table 9 in the Appendix, using the unstandardised variables of objective income position and perceived social position in ISSP 1999, indicates that the effect of perceived social position is stronger than that of objective income position,[23] unlike the results in Table 5; however, their standardised coefficients present not much difference between the two effects. This result confirms that the role of objective income position is not superior to that of perceived social position.

The results that the effect of objective income position is not distinguishable from that of perceived social position, and that the effect of objective social position is significantly stronger than that of perceived social position are robust to the estimation with the alternative dependent variable and the multilevel analysis, as shown in Tables 10 and 11 of the Appendix. These findings contradict *Hypothesis 1*, which should thus be reformulated.

---

[23] The 95% interval estimates of the two variables partly overlap in Columns (6) and (7), but the proportions of the overlap do not exceed the criterion discussed earlier.

Graphical evidence in Fig. 2 illustrates the relationships between perceptions of inequality and redistributive preferences, which are expressed as an aggregate level of the preferences in percentage terms across the decile groups of each variable. Graph (a) indicates a less distinct feature compared with the other graphs, although redistributive preferences increase slightly in the upper deciles of perceived actual inequality. Graph (b) provides a clear descending trend in redistributive preferences when the level of personal norms of inequality goes up; in other words, the more inequality people regard as desirable, the less redistributive preferences people have. Graph (c) shows an obvious increasing trend when the gap between perceived actual inequality and personal norms of inequality increases.[24]

Next, because of the dependency, the effect of perceived injustice was explored separately in Table 5 as well as in Tables 9, 10 and 11 of the Appendix. In Table 5, all the columns consistently demonstrate that perceived actual inequality and perceived injustice are significantly and positively associated with redistributive preferences, while personal norms of inequality are significantly but negatively linked to redistributive preferences. These findings buttress *Hypotheses 2, 3,* and *4,* as expected. They are also robust to the estimation with the alternative dependent variable and the multilevel logistic regression, as can be seen in Tables 10 and 11 of the Appendix.

Specifically, in Column (7) in Table 5, the result shows that a one-unit increase in perceived actual inequality, on average, leads to an increase of the odds of an individual being in favour of redistribution by a multiple of 1.462; in terms of percentage change, in this case, we can say that the odds for an individual to support redistribution are 46.2% higher than the odds for the individual being against redistribution. Next, for a one-unit increase in personal norms of inequality, the odds increase by a multiple of 0.562, which can be converted into its corresponding ratio counterpart above 1.0 by taking the inverse of the odds: $1/0.562 = 1.779$. In other words, a variation of one-unit leads to a change of 46.2% in the odds for perceived actual inequality and a change of 77.9% for personal norms of inequality. These relative effect sizes are similar to those in the other models in Table 5 and Tables 9, 10 and 11 of the Appendix.

We can also compare the marginal effects of the variables per one standard deviation: in the case of Column (7) in Table 5, an increase in perceived actual inequality increases the probability of supporting redistribution by 6.6%; an increase in personal norms of inequality decreases the probability by 10.9%. Fig. 3 also illustrates the marginal effects of the variables in the other models of Tables 5 and 9, which are very similar to each other. We can thus conclude that personal norms of inequality play a more crucial role in forming individuals' redistributive preferences than does perceived actual inequality.[25] Furthermore, Fig. 3 shows that the marginal effect of objective income position is not stronger than that of perceived social position, which contradicts the basic premise of the

---

[24] Additionally, the polychoric correlation analysis was conducted to assess the strength and direction of the association between the dichotomous variable of redistributive preferences and the standardised continuous measures of inequality perceptions: $r = 0.024$, -0.198, and 0.241 for perceived actual inequality, personal norms of inequality, and perceived injustice, respectively; all the correlation coefficients are significantly different from zero. These statistical correlations are consistent with the graphical evidence.

[25] In Table 5 as well as Tables 9, 10 and 11 of the Appendix, all the models show that the absolute values of the 95% interval estimates of the two variables do not overlap at all. This is also the case for the standardised coefficients of the variables, which are almost the same as their unstandardised coefficients, as the variables have already been standardised by country-year.
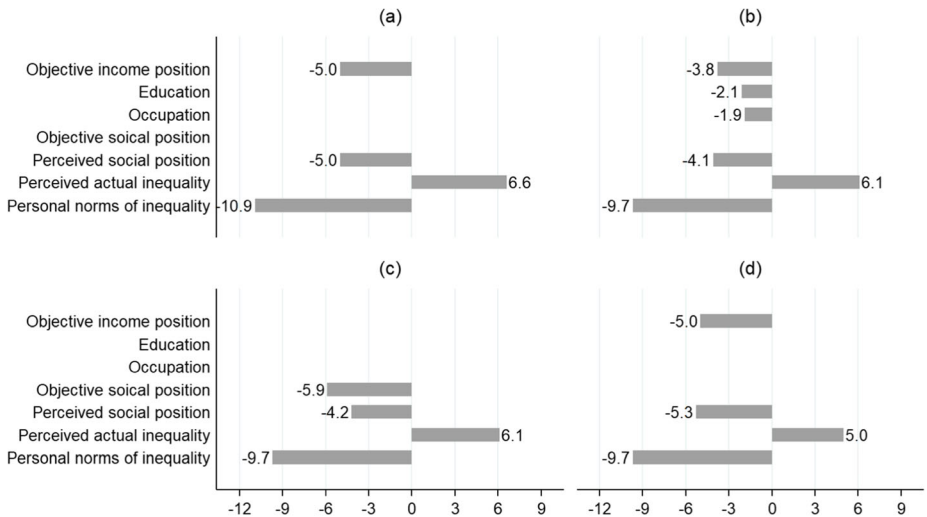
Fig. 3 The marginal effects of socioeconomic position and inequality perceptions on redistributive preferences
Notes: Estimated at a one standard-deviation-change of the variables, using *mchange* command in Stata. The values of the effects show the increase or decrease of the probability of supporting redistribution in percentage terms. Graph (**a**) is based on Column (7) in Table 5; Graph (**b**) is based on Column (8) in Table 5; Graph (**c**) is based on Column (9) in Table 5; and Graph (**d**) is based on Column (6) in Table 9

standard model of redistribution, while the marginal effect of the personal norms of inequality is the strongest.[26]

The fact that both perceived actual inequality and personal norms of inequality are significant implies that the discrepancy between them is also significant, which is confirmed in Table 5 and Tables 9, 10 and 11 of the Appendix. When it comes to the distribution of the unstandardised variable of perceived injustice, while a small number of respondents agreed that wage differences should increase more than their perceptions of actual wage gaps, a significant majority of respondents expressed the belief that perceived actual wage inequality is higher than the desired level of wage inequality. Amongst 72,863 observations of perceived injustice for 31 OECD countries in the ISSP Social Inequality modules, 65,505 (89.90%) observations have positive values, 5412 (7.43%) observations have negative values, and 1946 (2.67%) observations have a value of zero, which means that justice is evaluated as being perfect. Overall, most people agreed that wage distributions should be more equal than they are, but this does not necessarily mean that all of them favour redistribution; about 20% even amongst those who believe that their society is the most unjust (10th decile group) do not support redistribution, as illustrated in Graph (c) of Fig. 2.

In addition, perceived social position has a significant and negative impact on redistributive preferences, as expected, in Table 5 and Tables 9, 10 and 11 of the Appendix. This finding is consistent with the experimental research of Brown-Iannuzzi et al. (2015). Graph (b) in Fig. 1

---

[26] However, the comparison of these marginal effects should be treated with caution. This marginal effect measures the instantaneous rate of change for a continuous independent variable, but its effect depends on how the independent variable is scaled. Thus, even if we consider both the income and social position variables and the inequality perception variables as continuous, it is not easy to intuitively interpret the different marginal effects between them.
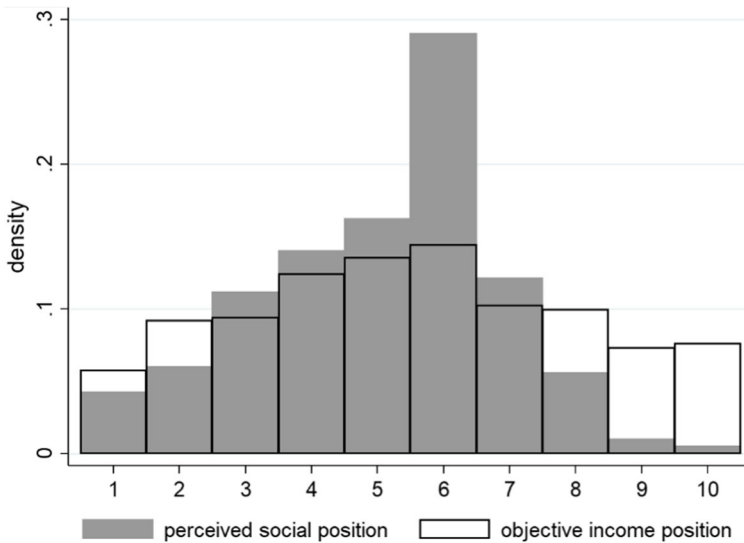
Fig. 4 Comparison of the distribution of perceived social position with that of objective income position *Notes*: The density histogram is based on the distribution of the responses for Questions B and C in Table 6 of the Appendix, using 22,107 observations for 20 OECD countries in ISSP 1999. Country-specific density histograms are presented in Fig. 5 of the Appendix

also illustrates a clear relationship between them.[27] Meanwhile, Fig. 4 indicates that the distribution of perceived social position is clearly different from that of objective income position, although their explanatory powers for redistributive preferences do not show much difference in the current analyses. This is in accord with a noticeable tendency for people to see themselves as being in the middle of the social hierarchy, according to the theories developed in social psychology (Evans and Kelley 2004; Kelley and Evans 1995; Merton 1968, chaps. 9–10; Stouffer et al. 1949).[28] It also explains the discrepancy between actual income inequality and perceived inequality based on the distribution of subjective social position (see Choi 2019).

The perceived Gini based on the distribution of perceived social position is also significantly associated with redistributive preferences. Thus, it turns out that both perceived social position and its distributional structure as a contextual factor matter in forming individuals' preferences for redistribution. By contrast, market inequality does not have a significant effect on individuals' redistributive preferences; its effect is consistently negative, as shown in Table 12 of the Appendix, though. That is, this empirical evidence does not support the standard redistribution hypothesis that an increase in market inequality leads to a rise in

---

[27] The highest level of the perceived social position group shows that a greater proportion of individuals in this group favour redistribution than that of level 8 or level 9, but it does not seem to be meaningful because the sample size of that group is very small compared with other groups: amongst 103 out of 21,348 respondents (0.48%), 47 individuals (45.63%) supported redistribution. Moreover, it is not surprising that, amongst the top 1% or so of U.S. wealth-holders (83 respondents), only 13% favoured redistributive action by government when the same question as Question A in Table 6 of the Appendix was used (Page et al. 2013, p. 64).

[28] According to a reference-group theory, 'most people see themselves as average and unexceptional. Even very high-status people place many others above themselves and very low-status people see others even lower. Hence, most people locate themselves near the middle of class hierarchy' (Lindemann 2007, p. 55). Moreover, Bublitz (2016) and Cruces et al. (2013) presented considerable empirical evidence that low-income earners have positive biases (overestimating their income position), whereas high-income earners have negative biases (underestimating their income position).

support for redistribution.[29] With respect to the impacts of the other control variables, as shown in Table 12 of the Appendix, age, sex, and union membership show a strong association with redistributive preferences, as predicted. The effects of economic growth and ethnic fractionalisation are weakly significant, while the effect of economic development seems to be negligible.

Finally, there might be questions about endogeneity between perceptions of inequality and support for redistribution. It is plausible that those who favour redistribution may perceive more inequality and have more equal distributional norms than those who do not support redistribution to rationalise their redistributive preferences. That is, the causality between inequality perceptions and redistributive preferences might run in both directions. Few researchers have tried to tackle the endogeneity issue by introducing instrumental variables, except for Kuhn (2015a, 2015b). In this study, following Dustmann and Preston's (2001) approach, which suggests an instrument at a higher level of spatial aggregation, the regional means of the inequality perception measures in each country-year were used as instruments in an extra analysis.[30] The main findings are robust to the instrumental variables estimations; the results are not reported but available on request.

6 Discussion and conclusion

Many previous studies trying to explain redistribution are premised on the idea that policy preferences determined by economic situation lead to policy outcomes at the society level. This hypothesis implies that objective income location determines preferences for redistribution, regardless of whether or not redistributive preferences translate into redistribution.[31] This inquiry challenges this individual-level mechanism that is embedded in the conventional redistribution theory in the following ways: first, by directly comparing the effect of objective income or social status on redistributive preferences with that of subjective social status and second, by demonstrating the significant role of individuals' inequality norms in the preference formation compared with the impact of actual inequality that individuals perceive.

Regarding individuals' socioeconomic position, the empirical evidence here shows that the effects of objective income position and perceived social position are not statistically distinguishable; however, the distribution of redistributive preferences is more strongly associated with objective social position than subjective social position. In particular, the fact that the

---

[29] Additionally, the interaction effects between perceived or actual inequality (the perceived Gini and the market Gini) and the variables of individuals' socioeconomic position and inequality perceptions (objective income position, objective social position, perceived social position, perceived actual inequality, and personal norms of inequality) were explored in an extra analysis, using multilevel logistic regressions with the models in Columns (13) and (15) of Table 5. However, there were no statistically significant interaction effects between the contextual variables and the individual-level variables.

[30] Regarding the estimation techniques, the probit model with continuous endogenous regressors (*ivprobit* in Stata), a conditional mixed-process (*cmp*) estimator, developed by Roodman (2011), with the probit model, and two-stage least squares (2SLS) were alternatively employed.

[31] Kuhn (2011, p. 637) claimed that a close association between subjective inequality measures and redistributive preferences provides 'indirect evidence' of the link between individual perceptions of inequality and redistribution. However, considering that policy outcomes are not always responsive to the public (Page and Shapiro 1983, p. 189), it is not evident that that inequality perceptions affect redistribution unless there is convincing evidence that redistributive preferences dictate redistribution. Thus, replacing a measure of actual inequality with that of perceived inequality is not enough to rescue the conventional redistribution hypothesis assuming the positive relationship between actual inequality and redistribution.

effect of objective income position on redistributive preferences is not stronger than that of perceived social position implies that it is hard to corroborate the premise of the standard redistribution model that is based on the decisive role of actual income. Meanwhile, if individuals' levels of education and occupation, in addition to objective income position, are taken together, its explanatory power is considerably strengthened. This result also enhances the argument that objective income position is not the only determining factor in shaping preferences for redistribution.

However, these findings should be interpreted with caution because of the measurement errors, such as social desirability bias, in the socioeconomic position variables based on self-reporting. Survey respondents tend to underreport socially undesirable activities and overreport socially desirable ones. This bias becomes significant when sensitive questions, such as sexual activities and illegal behaviours, are asked. Income or wealth questions are also considered to be sensitive and thus yield very high non-response rates and reporting errors (Juster and Smith 1997; Moore et al. 2000). Moreover, there is strong evidence that level of misreporting depends on features of the survey design when questions are sensitive (Tourangeau and Yan 2007); self-completion mode rather than face-to-face mode encourages respondents to answer more honestly, for example.

Despite the social desirability bias on the self-reported income, since the objective income position variable is based on top-coding and ordinal income intervals, the potential of the bias to influence the estimates for redistributive preferences can be effectively mitigated (Hariri and Lassen 2017). Also, the effect of perceived social position is expected to be less biased than that of objective income position, considering that there is a far lower level of non-response rate, and that the response rate has a negligible difference between administrative modes of data collection in the perceived social position variable,[32] which is indirect evidence of a low level of social desirability bias.

We also explored not only the level of wage inequality that individuals perceive but also the level of wage inequality that they view as just. Then the link between these perceptions of inequality and redistributive preferences was investigated by using the new inequality perception measures developed here. The results indicate that both individuals' assessment of actual inequality and their distributional norms significantly matter in shaping preferences for redistribution; the effect size of the latter is consistently greater than that of the former. These findings confirm that demand for redistribution is driven not only by socioeconomic position but also by other-regarding preferences; more specifically, individuals' attitudes towards what others should earn appear to be more important in predicting preferences for redistribution than their assessment of what others do earn.

Accordingly, we can conclude that people are self-interested but also concerned about the payoffs of others, which implies that support for redistribution is a complex phenomenon driven by multiple motivations. More importantly, this study provides empirical evidence that pure economic self-interest does not have a stronger impact on support for redistribution than

---

[32] Amongst the ISSP surveys used in the main analysis, administrative mode is recorded only in ISSP 2009. In the variable of objective income position, the non-response rate of face-to-face mode is 19.77% (7478 observations), and that of self-completion mode is 10.71% (1865 observations); in the variable of perceived social position, however, the non-response rate of face-to-face mode is 1.67% (630 observations), and that of self-completion mode is 1.69% (294 observations). From the facts that the level of non-response rate is very low in the perceived social position variable, and that the difference between the modes is negligible (0.02%), we can infer that the question asking perceived social position is far less sensitive than that on objective income position, thus generating more accurate responses.

subjective self-interest, and that the effect of personal norms of inequality is stronger than that of perceived actual inequality. These findings are new in cross-national comparative survey research. Considering that the measure of subjective self-interest is based on the relative standing of an individual compared with others, and that personal norms of inequality might be related to social norms or justice in some ways, the current study also contributes to behavioural economics on other-regarding preferences as well as redistributive politics.

Additionally, the findings of this study contradict those of Finseraas (2009), which show a significant relationship between net income inequality and individuals' support for redistribution. Finseraas (2009, p. 101) admitted that using net income inequality is an 'obvious shortcoming', but data availability prevented him from employing the market income inequality factor that 'the M-R [Meltzer-Richard] model refers to'. However, the impacts of both net inequality and market inequality on individuals' redistributive preferences are rarely significant in the present analyses.[33]

The key findings of the current study have grave theoretical and practical implications. First and foremost, this study demonstrates that objective income location is not more crucial than subjective social location in forming preferences for redistribution. This evidence undermines the underlying mechanism of the Meltzer-Richard model by questioning the decisive role of pure economic self-interest in shaping preferences for redistribution. In the existing literature, there have been endeavours to find other influential factors for redistributive preferences than individuals' current income. For instance, the effect of individual mobility experience from Piketty's (1995) learning model has empirical support (e.g. Guillaud 2013; Pfarr 2012). However, prior studies, except for some experimental research (e.g. Brown-Iannuzzi et al. 2015), did not challenge the supremacy of current income by providing empirical evidence; to my knowledge, this study is the first attempt to do that with the cross-national comparative survey data.

Second, this research reveals that personal norms of inequality are a more significant factor for redistributive preferences than perceived actual inequality. There has been insufficient attention to the fact that misperception of inequality is only a part of the story that explains preferences over redistribution. In this regard, the findings of Bublitz (2016) can be revisited that correcting biased perceptions of income position does not consistently change opinions towards redistribution. In the same vein, Bartels (2005, p. 25) pointed out 'real and profound limits of political information as a transforming force' when it comes to policy preferences. These empirical findings have already implied the existence of other important cognitive factors that are distinct from both perceived social position and perceived inequality in a given society; the evidence presented here strengthens this perspective.

Last, with respect to policy implications, the fact that individuals' inequality norms strongly affect policy preferences reminds us of the importance of social interventions targeting norm perceptions. In view of the fact that personal norms can be understood as being internalized social norms (Thøgersen 2009), a better understanding of the personal and social norms of inequality may enable us to figure out a more effective way of changing these norms that may make a difference in policy preferences. There is no guarantee that policy preferences directly translate into policy outcomes because of the complex social and political processes (see Powell 2005); however, there is no supply without demand. It is hoped that not only psychologists but also political scientists can come to see 'norm perception as a vehicle for social change' (Tankard and Paluck 2016, p. 182).

---

[33] The results of the effect of market inequality are reported in Table 8 of the Appendix; those of net inequality are not reported here but available on request.

References

Adler, N.E., Epel, E.S., Castellazzo, G., Ickovics, J.R.: Relationship of subjective and objective social status with psychological and physiological functioning: preliminary data in healthy white women. Health Psychol. **19**, 586–592 (2000)

Alesina, A., Glaeser, E.L.: Fighting Poverty in the US and Europe: a World of Difference. Oxford University Press, Oxford (2004)

Alesina, A., La Ferrara, E.: Preferences for redistribution in the land of opportunities. J. Public Econ. **89**, 897–931 (2005)

Alesina, A., Giuliano, P.: Preferences for redistribution. In: Benhabib, J., Bisin, A., Jackson, M.O. (eds.) Handbook of Social Economics, vol. 1A, pp. 93–131. North-Holland (2011)

Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., Wacziarg, R.: Fractionalization. J. Econ. Growth. **8**, 155–194 (2003)

Austin, P.C., Hux, J.E.: A brief note on overlapping confidence intervals. J. Vasc. Surg. **36**, 194–195 (2002)

Bartels, L.M.: Homer gets a tax cut: inequality and public policy in the American mind. Perspect. Polit. **3**, 15–31 (2005)

Benabou, R., Ok, E.A.: Social mobility and the demand for redistribution: the POUM hypothesis. Q. J. Econ. **116**, 447–487 (2001)

Beramendi, P., Anderson, C.J.: Inequality and democratic representation: the road traveled and the path ahead. In: Beramendi, P., Anderson, C.J. (eds.) Democracy, Inequality, and Representation: a Comparative Perspective, pp. 387–416. Russell Sage Foundation, New York (2008)

Bolton, G.E.: A comparative model of bargaining: theory and evidence. Am. Econ. Rev. **81**, 1096–1136 (1991)

Bowles, S., Gintis, H.: Reciprocity, self-interest, and the welfare state. Nord. J. Polit. Econ. **26**, 33–53 (2000)

Brown-Iannuzzi, J.L., Lundberg, K.B., Kay, A.C., Payne, B.K.: Subjective status shapes political preferences. Psychol. Sci. **26**, 15–26 (2015)

Bublitz, E.: Perceptions of Inequality Survey 2015/2016. Global Economic Dynamics Study. Bertelsmann Stiftung, Gütersloh (2016)

Chambers, J.R., Swan, L.K., Heesacker, M.: Better off than we know: distorted perceptions of incomes and income inequality in America. Psychol. Sci. **25**, 613–618 (2014)

Choi, G.: Revisiting the redistribution hypothesis with perceived inequality and redistributive preferences. Eur. J. Polit. Econ. **58**, 220–244 (2019)

Clark, A.E., D'Angelo, E.: Upward Social Mobility, Well-Being and Political Preferences: Evidence from the BHPS. Working paper. Paris School of Economics-CNRS, Paris (2013)

Corneo, G., Grüner, H.P.: Individual preferences for political redistribution. J. Public Econ. **83**, 83–107 (2002)

Cruces, G., Perez-Truglia, R., Tetaz, M.: Biased perceptions of income distribution and preferences for redistribution: evidence from a survey experiment. J. Public Econ. **98**, 100–112 (2013)

Cumming, G., Finch, S.: Inference by eye: confidence intervals and how to read pictures of data. Am. Psychol. **60**, 170–180 (2005)

Cusack, T.R., Iversen, T., Rehm, P.: Economic shocks, inequality, and popular support for redistribution. In: Beramendi, P., Anderson, C.J. (eds.) Democracy, Inequality, and Representation: a Comparative Perspective, pp. 203–231. Russell Sage Foundation, New York (2008)

Dahlberg, M., Edmark, K., Lundqvist, H.: Ethnic diversity and preferences for redistribution. J. Polit. Econ. **120**, 41–76 (2012)

Dallinger, U.: Public support for redistribution: what explains cross-national differences? J. Eur. Soc. Policy. **20**, 333–349 (2010)

Dustmann, C., Preston, I.: Attitudes to ethnic minorities, ethnic context and location decisions. Econ. J. **111**, 353–373 (2001)

Engelhardt, C., Wagener, A.: Biased perceptions of income inequality and redistribution. CESifo working paper no. 4838. Center for Economic Studies & Ifo institute, Munich (2014)

Erikson, R., Goldthorpe, J.H., Portocarero, L.: International class mobility in three western European societies: England France and Sweden. Brit. J. Sociol. **30**, 415–441 (1979)

Eriksson, K., Simpson, B.: What do Americans know about inequality? It depends on how you ask them. Judgm. Decis. Mak. **7**, 741–745 (2012)

Evans, M.D.R., Kelley, J.: Subjective social location: data from 21 nations. Int. J. Public Opin. R. **16**, 3–38 (2004)

Fatke, M.: Inequality perceptions, preferences conducive to redistribution, and the conditioning role of social position. Societies. **8**, 1–14 (2018)

Feenstra, R.C., Inklaar, R., Timmer, M.P.: The next generation of the Penn world table. Am. Econ. Rev. **105**, 3150–3182 (2015)

Finseraas, H.: Income inequality and demand for redistribution: a multilevel analysis of European public opinion. Scand. Polit. Stud. **32**, 94–119 (2009)

Fong, C.M.: Social preferences, self-interest, and the demand for redistribution. J. Public Econ. **82**, 225–246 (2001)

Gimpelson, V., Treisman, D.: Misperceiving inequality. Econ. Polit. **30**, 27–54 (2018)

Gründler, K., Köllner, S.: Determinants of governmental redistribution: income distribution, development levels, and the role of perceptions. J. Comp. Econ. **45**, 930–962 (2017)

Guillaud, E.: Preferences for redistribution: an empirical analysis over 33 countries. J. Econ. Inequal. **11**, 57–78 (2013)

Güth, W., Schmittberger, R., Schwarze, B.: An experimental analysis of ultimatum bargaining. J. Econ. Behav. Organ. **3**, 367–388 (1982)

Hariri, J.G., Lassen, D.D.: Income and outcomes: social desirability bias distorts measurements of the relationship between income and political behaviour. Public Opin. Quart. **81**, 564–576 (2017)

ISSP: Research Group: International Social Survey Programme (ISSP) 1985–2014. GESIS Data Archive, Cologne (2016)

Jasso, G.: Studying justice: measurement, estimation, and analysis of the actual reward and the just reward. In: Törnblom, K., Vermunt, R. (eds.) Distributive and Procedural Justice: Research and Social Applications, pp. 225–253. Ashgate, Aldershot (2007)

Juster, F.T., Smith, J.P.: Improving the quality of economic data: lessons from the HRS and AHEAD. J. Am. Stat. Assoc. **92**, 1268–1278 (1997)

Jæger, M.M.: The effect of macroeconomic and social conditions on the demand for redistribution: a pseudo panel approach. J. Eur. Soc. Policy. **23**, 149–163 (2013)

Karabarbounis, L.: One dollar, one vote. Econ. J. **121**, 621–651 (2011)

Karadja, M., Möllerström, J., Seim, D.: Richer (and holier) than thou? The effect of relative income improvements on demand for redistribution. IFN working paper no. 1042. Research Institute of Industrial Economics, Stockholm (2014)

Kelley, J., Evans, M.D.R.: Class and class conflict in six Western nations. Am. Sociol. Rev. **60**, 157–178 (1995)

Kelly, N.J., Enns, P.K.: Inequality and the dynamics of public opinion: the self-reinforcing link between economic inequality and mass preferences. Am. J. Polit. Sci. **54**, 855–870 (2010)

Kenworthy, L., McCall, L.: Inequality, public opinion and redistribution. Socio-Econ. Rev. **6**, 35–68 (2008)

Kerr, W.R.: Income inequality and social preferences for redistribution and compensation differentials. J. Monetary Econ. **66**, 62–78 (2014)

Kim, H., Lee, Y.: Socioeconomic status, perceived inequality of opportunity, and attitudes toward redistribution. Soc. Sci. J. **55**, 300–312 (2018)

Kluegel, J.R., Smith, E.R.: Beliefs about Inequality: Americans' Views of What Is and What Ought to be. Aldine de Gruyter, Hawthorne (1986)

Kuhn, A.: In the eye of the beholder: subjective inequality measures and individuals' assessment of market justice. Eur. J. Polit. Econ. **27**, 625–641 (2011)

Kuhn, A.: The subversive nature of inequality: subjective inequality perceptions and attitudes to social inequality. IZA discussion paper no. 9406. Institute for the Study of labor, Bonn (2015a)

Kuhn, A.: The individual perception of wage inequality: a measurement framework and some empirical evidence. IZA discussion paper no. 9579. Institute for the Study of labor, Bonn (2015b)

Kuziemko, I., Norton, M.I., Saez, E., Stantcheva, S.: How elastic are preferences for redistribution? Evidence from randomized survey experiments. Am. Econ. Rev. **105**, 1478–1508 (2015)

Lareau, A., Conley, D. (eds.): Social Class: how Does it Work? Russell Sage Foundation, New York (2008)

Lindemann, K.: The impact of objective characteristics on subjective social position. Trames-J. Humanit. Soc. **11**, 54–68 (2007)

McCarty, N., Pontusson, J.: The political economy of inequality and redistribution. In: Salverda, W., Nolan, B., Smeeding, T.M. (eds.) The Oxford Handbook of Economic Inequality, pp. 665–692. Oxford University Press, Oxford (2009)

Meltzer, A.H., Richard, S.F.: A rational theory of the size of government. J. Polit. Econ. **89**, 914–927 (1981)

Merton, R.K.: Social Theory and Social Structure. Free Press, New York (1968)

Moore, J.C., Stinson, L.L., Welniak Jr., E.J.: Income measurement error in surveys: a review. J. Off. Stat. **16**, 331–361 (2000)

Mosimann, N., Pontusson, J.: Bounded Communities of Solidarity: Union Membership and Support for Redistribution in Contemporary Europe. Working Paper. University of Geneva, Geneva (2014)

Neckerman, K.M., Torche, F.: Inequality: causes and consequences. Annu. Rev. Sociol. **33**, 335–357 (2007)

Niehues, J.: Subjective Perceptions of Inequality and Redistributive Preferences: an International Comparison. Discussion Paper. Cologne Institute for Economic Research, Cologne (2014)

Norton, M., Ariely, D.: Building a better America—one wealth quintile at a time. Perspect. Psychol. Sci. **6**, 9–12 (2011)

Osberg, L., Smeeding, T.: "Fair" inequality? Attitudes towards pay differentials: the United States in comparative perspective. Am. Sociol. Rev. **71**, 450–473 (2006)

Page, B.I., Shapiro, R.Y.: Effects of public opinion on policy. Am. Polit. Sci. Rev. **77**, 175–190 (1983)

Page, B.I., Bartels, L.M., Seawright, J.: Democracy and the policy preferences of wealthy Americans. Perspect. Polit. **11**, 51–73 (2013)

Peters, Y., Ensink, S.J.: Differential responsiveness in Europe: the effects of preference difference and electoral participation. West Eur. Polit. **38**, 577–600 (2015)

Pfarr, C.: Meltzer-Richard and social mobility hypothesis: revisiting the income redistribution nexus using German choice data. Discussion paper 10-12. University of Bayreuth, Bayreuth (2012)

Piketty, T.: Social mobility and redistributive politics. Q. J. Econ. **110**, 551–584 (1995)

Powell, G.B.: The chain of responsiveness. In: Diamond, L., Morlino, L. (eds.) Assessing the Quality of Democracy, pp. 62–76. Johns Hopkins University Press, Baltimore (2005)

Rainer, H., Siedler, T.: Subjective income and employment expectations and preferences for redistribution. Econ. Lett. **99**, 449–453 (2008)

Roodman, D.: Fitting fully observed recursive mixed-process models with cmp. Stata J. **11**, 159–206 (2011)

Roth, A.E., Prasnikar, V., Okuno-Fujiware, M., Zamir, S.: Bargaining and market behavior in Jerusalem, Ljubljana, Pittsburgh, and Tokyo: an experimental study. Am. Econ. Rev. **81**, 1068–1095 (1991)

Rueda, D.: Food comes first, then morals: redistribution preferences, altruism and group heterogeneity in Western Europe. CAGE Working Paper No. 200. Centre for Competitive Advantage in the Global Economy, University of Warwick (2014)

Schalembier, B.: Measuring perceived income inequality: an evaluation of different methods. Paper presented at the statistical conference (SIS 2015), Treviso (2015)

Schmidt-Catran, A.W.: Economic inequality and public demand for redistribution: combining cross-sectional and longitudinal evidence. Socio-Econ. Rev. **14**, 119–140 (2016)

Schneider, S.M.: Income inequality and its consequences for life satisfaction: what role do social cognitions play? Soc. Indic. Res. **106**, 419–438 (2012)

Sen, A.: Social justice and the distribution of income. In: Atkinson, A.B., Bourguignon, F. (eds.) Handbook of Income Distribution, vol. I, pp. 59–85. Elsevier, Amsterdam (2000)

Solt, F.: The Standardized World Income Inequality Database. Soc. Sci. Quart. 97, 1267–1281, SWIID Version 5.1 (2016)

Soroka, S.N., Wlezien, C.: On the limits to inequality in representation. PS-Polit. Sci. Polit. **41**, 319–327 (2008)

Steele, L.G.: Income inequality, equal opportunity, and attitudes about redistribution. Soc. Sci. Quart. **96**, 444–464 (2015)

Stouffer, S.A., Suchman, E.A., de Vinney, L.C., Star, S.A., Williams Jr., R.M.: The American Soldier: Adjustment during Army Life. Princeton University Press, Princeton (1949)

Tankard, M.E., Paluck, E.L.: Norm perception as a vehicle for social change. Soc. Iss. Policy Rev. **10**, 181–211 (2016)

Thøgersen, J.: The motivational roots of norms for environmentally responsible behaviour. Basic Appl. Soc. Psych. **31**, 348–362 (2009)

Tourangeau, R., Yan, T.: Sensitive questions in surveys. Psychol. Bull. **133**, 859–883 (2007)

Tóth, I.G., Keller, T.: Income distributions, inequality perceptions and redistributive claims in European societies. GINI Discussion Paper No. 7. Amsterdam Institute for Advanced Labour Studies (AIAS), Amsterdam (2011)

Whitmeyer, J.M.: Past and future applications of Jasso's justice theory. Sociol. Theor. **22**, 432–444 (2004)

Wolfe, J.D.: The effects of socioeconomic status on child and adolescent physical health: an organization and systematic comparison of measures. Soc. Indic. Res. **123**, 39–58 (2015)