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Consolidating behavioural economics and rational choice theory

Insights from inequality research

Klarizze Anne Martin Puzon and Rachel M. Gisselquist*

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Abstract: Using illustrations from research on inequality, this paper offers evidence on the strengths of 'behavioural synthesis', i.e. the reconciliation between neoclassical and behavioural economics. We compare how theoretical models of absolute and relative inequality have evolved from assumptions of income maximization to status-seeking competition, and to altruism. We emphasize the relevance of experiments in testing competing theories and mitigating empirical shortcomings. We conclude that methodological pluralism, i.e. scientific integration, is necessary when it comes to understanding inequality and propose strategies on how it can be done.

Key words: inequality, behavioural economics, scientific integration, pluralism

JEL classification: C90, B41, D30, D91

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*UNU-WIDER, Helsinki, Finland, corresponding author: puzon@wider.unu.edu

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Information and requests: publications@wider.unu.edu

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Katajanokanlaituri 6 B, 00160 Helsinki, Finland

I Introduction

Debates on the relevance of behavioural economics to standard economic theory are ongoing (Levine 2012; Truc 2018). At one extreme, some argue for a new general research programme based on behavioural and experimental economics to replace neoclassical economics (Santos 2011). Behavioural and neoclassical economics seem to some to be fundamentally incompatible, with the former being dependent on psychology and the latter on core assumptions of rationality and individual utility maximization. Critics of behavioural economics see its contributions as marginal (Binmore 1999; Starmer 1999), expressing strong scepticism about the validity and generalizability of experiments in explaining economic behaviour. Critics of neoclassical economics see its propositions as fundamentally problematic as they are based on unrealistic assumptions. An alternative approach, however, offers a compromise, where psychological concepts are complementary tools to be used in conjunction with—and not as a substitute for—rational choice models (Angner 2015; Guala 2002).

This paper supports the latter perspective. Our objective is to provide concrete evidence on the concept of 'behavioural synthesis' (Angner 2019), which proposes a pragmatic reconciliation between neoclassical and behavioural economics. We do so through the lens of inequality research. First, we argue that cross-collaboration allows for diversity in models. Diversity offers a more powerful explanation of economic phenomena (Aydinonat 2018; Joffe 2017). Second, we suggest ways in which behavioural economists can use neoclassical theory. Our paper considers central assumptions widely used in theoretical models of inequality. Showing empirical deviations from theoretical predictions, we posit that behavioural economists can strengthen neoclassical models. We advocate for Rabin's (2013) proposal of 'Portable Extensions of Existing Models' where rational choice models are a special case of models that consider alternative behavioural parameters. This allows for psychological realism in economics while keeping its orthodox techniques.

We apply 'behavioural synthesis' to the conceptualization of inequality in relative versus absolute terms. The impact of inequality on various outcomes is the subject of a considerable literature (Ferreira et al. 2021). Most quantitative studies employ measures of *relative* inequality. An emerging body of research, however, suggests that measures of *absolute* inequality might be appropriate (Ravallion 2018). For simplicity, we discuss inequality in terms of income. Relative inequality then refers to the average disproportionality of income. The Gini coefficient is the most common measure of relative inequality. Absolute inequality refers to absolute differences in income. A common measure of absolute inequality, the absolute Gini, is equivalent to the Gini coefficient multiplied by the mean of the distribution. Econometric literature shows that relative and absolute inequality measurements may be inconsistent. While the former has shown a declining global trend, the latter has an increasing trend (Nino-Zarazua et al. 2017). Thus, the choice of measure has empirical as well as theoretical significance (Alpizar et al. 2005). Building on this work and inspired by 'behavioural synthesis', we investigate the question: Does the reference point, i.e. the point of absolute or relative comparison, matter in neoclassical and behavioural models? What can be learned from experiments about how inequality influences an individual's actions which may help to improve existing theories?

The remainder of this paper is structured as follows. Sections 2 and 3 analyse core theoretical models that link inequality to various outcomes. We explore differences and similarities across key rational choice and behavioural theories on income comparisons; between models that assume self-interested versus other-regarding actors; and across models in which actions are driven alternately by wealth- and status-seeking competition, altruism, and fairness. Section 4 shows how

experiments can facilitate communication among methodologies. Finally, Section 5 concludes by suggesting pluralism in inequality research (Grabner and Strunk 2020). Using specific examples, we show that the integration of neoclassical and behavioural economics will support better understanding of issues of context (especially for developing countries), reference groups, and measurement.

2 Neoclassical models

2.1 Median voter preferences

Standard economic theory assumes rational choice and self-interested behaviour (i.e. *Homo Economicus*) where one's satisfaction is solely based on one's individual income or absolute utility. Early theories on inequality relied on general equilibrium models which explore labour–leisure trade-offs. Central to this is the model by Meltzer and Richard (1981) (MR from now on). The MR model predicts macroeconomic output and fiscal policy as a function of skill-dependent income distribution. Relevant variables are the average population income and the median voter's income, as the median voter is the sole decision maker in the model. Agents merely maximize their personal incomes after redistribution, i.e. after taxes and transfers. Intuitively, the predictions of MR can be understood as a function of absolute income inequality, i.e. the absolute difference between average and median income levels. Heterogeneity in individual productivities is the mechanism behind inequality in pre-tax incomes.

We provide an interpretation of MR. The median voter's decision-making strategy depends on comparison between that voter's income and the average or per capita income. For instance, if the median voter earns less than the mean income (i.e. the median voter is part of the majority and is 'poor'), then the tax rate is positive. The median voter has a lower incentive to work because the voter knows that the richer population's income will be redistributed to the poor through welfare payments. The median voter will set higher flat tax rates at the point that maximizes the voter's personal income and increased welfare benefits. When the difference in productivities (or income) between the average and median voter is high, the tax rate and hence the level of lump-sum transfers increases. Overall, MR shows that rising economic inequalities will lead to more social spending and greater redistribution. We emphasize that this prediction relies solely on the assumption that income distribution is skewed to the right. These theoretical observations are driven by the strong assumption that the median voter's income is lower than the average income. Alesina and Rodrik (1994) and Persson and Tabellini (1995) proposed adaptations of the MR model to a dynamic setting with growth. In their extensions, however, the ranking of individuals (e.g. representative average agent or median voter) was not modified in the growth process. Consequently, the income distribution was notably time-invariant and the theoretical predictions from MR remained the same.

Empirical attempts to prove MR's theory have been mixed. The cross-country analysis by Perotti (1996) did not find significant evidence of a positive effect of inequality on tax rates for the middle class. This is similar to the work of Milanovic (2000) in a cross-sectional regression of democratic countries. He observed correlation between inequality measures (especially the Gini coefficient) and income redistribution to the poor. However, he found no evidence in support of MR's median voter hypothesis.

Alesina and Angeletos (2005) proposed an alternative approach. They hypothesized that MR's prediction may not be applicable to all countries. Individual beliefs about fairness may influence people's choices. Differences in political support for redistribution will reflect differences in social perceptions of the sources of inequality. Central to this hypothesis is the notion of justifiable (i.e. based on effort or talent) and unjustifiable (i.e. based on luck) inequality. To take these into

account, Alesina and Angeletos (2005) offered a normative model that explicitly explored the notion of an *ideal* level of income inequality. They argued that redistributive preferences were determined by differences between the actual income distribution and an ideal level of distribution.

We provide highlights of the model by Alesina and Angeletos. Actual inequality can be decomposed into two forms: earned income inequality through labour and unearned inequality through luck and non-work sources. Alesina and Angeletos conjectured that perceptions of effort and luck matter in determining the effect of initial inequality on redistribution. Like MR, they also employed a general equilibrium model characterized by labour–leisure trade-offs. Again, the median voter is the decision maker when it comes to fiscal policy. They noted that when the median voter believes in meritocracy, societies have lower demand for redistribution. When the majority of the population regard effort and talent as more important than luck (e.g. heritage) in determining income, taxes, and social spending, both decrease. The hypothesis of MR (i.e. higher income inequality leads to more redistribution) only remains true for societies that give more weight to luck as a source of inequality.

Alesina and Angeletos (2005) supported their findings with a cross-country econometric analysis. Using social spending as a percentage of gross domestic product (GDP) as their dependent variable, they specifically tested the effects of relative income inequality (Gini coefficient) while also controlling for the belief that income is mostly determined by luck. They observed a significant, positive association between the percentage of the sample that believed that luck was the main income determinant and the proportion of social spending over GDP. Note, however, that while Alesina and Angeletos' theoretical model implies absolute inequality (as does MR's), their econometric analysis relies on data on relative inequality.

The traditional macroeconomic models described above have provided contrasting predictions on how unequal incomes affect demand for redistributive transfers. Both depend on standard assumptions of individual utility maximization. Despite discrepancies implied in past empirical work, however, what remains missing in these theoretical models are direct comparisons between relative and absolute measures of inequality. Also lacking is an understanding of how heterogenous individual preferences may affect these country-level outcomes. In MR, results are solely dependent on aggregate preferences, as is common in macroeconomics. While the model of Alesina and Angeletos deviates from assumptions of self-interest and has elements of other-regarding behaviour, it also focuses on the ideal or 'what should be'. Results from these rational choice models are conditional on postulated median voter behaviour. The influence of inequality, moreover, is assumed to only work through the voting mechanism. Also absent is a fuller explanation for individual-level motivation for redistribution. Are individuals purely status-seeking? Our subsequent discussion offers the possibility to go beyond the notion of self-interest.

2.2 Status-seeking preferences

Fairness concerns can be affected by an individual's actual rank in the distribution of income. Here we explore this possibility by examining models of individual decision-making. We first look at microeconomic models which state that more consumption of a status-bearing good makes one better off. A set of these models assumes status as the distance between one's personal and other people's possession of a positional good (e.g. luxury goods such as cars that symbolize high status). The more individuals own of this type of positional good compared to others, the greater is their satisfaction (Bowles and Park 2005). Meanwhile, others assume status as being represented by the rank in the distribution of the status-bearing asset (Corneo and Jeanne 1998). These papers lack an explanation of which assumption is more appropriate (Bilancini and Boncinelli 2008). The findings generated rely on the assumption that status will always have a positive association with individual utility. Most assume that this hypothesis will always hold, regardless of how income

comparisons are measured. We thus focus our discussion on the seminal work of Clark and Oswald (1998), as it explicitly distinguishes between absolute and relative measures.

The model by Clark and Oswald (1998) is like an effort allocation task (i.e. whether or not to do a given action with a corresponding opportunity cost). In contrast to standard economic theory, they do not regard individual incomes as the sole source of satisfaction. Their main assumption is that, when it comes to decision-making, individuals have concern about their social status or relative position. We summarize their specifications as follows: $U_i = Z_i h(*) + (1-Z_i)h(l_i) - C(l_i)$, *where we denote* the following (1) *Proportional:* $h(*) = (l_i/l_{-i})$ *&* (2) *Difference:* $h(*) = (l_i - l_{-i})$. Here l_i is the action by individual i (i.e. possession of a status-bearing asset) and l_{-i} is the average of actions undertaken by others (i.e. other people's possessions of the asset). This action is assumed to impose an opportunity cost $C(l_i)$. Social comparisons are derived from $h(*)$. Relative position is modelled through a proportional comparison model (i.e. relative inequality) and a difference comparison model (i.e. absolute inequality). In the former, status is reflected by the ratio between individual actions. In the latter, status is given in additive form or the absolute difference. Predictions show that individuals with a comparison-concave utility emulate the behaviour of others, while those with comparison-convex utility deviate from the norm. To synthesize, this model shows that individuals prefer to be above others and dislike being at a disadvantage relative to others. Especially valid for richer individuals in society, this implies that unequal income levels do not necessarily mean greater demand for redistribution. From an empirical perspective, the survey study by Johansson-Stenman et al. (2002) is relevant. They concluded that a relative comparison, as in the proportional model, is a better predictor of positional concerns.

In summary, we have seen that papers along the lines of Clark and Oswald (1998) specifically focused on positional concerns. It is predicted that initial inequality can heighten perceived competition for status and lead to less distribution. In the next section, we distinguish another set of models that emphasize fairness concerns instead of status. They propose preferences that avoid any form of income disparity. Inequality is sometimes predicted to increase redistribution.

3 Other-regarding models

Behavioural economics offers a new approach to the conceptualization of inequality. Central to this approach are social preferences, representing a deviation from neoclassical assumptions of rationality (Fehr and Fischbacher 2002). People can be pro-social, not just profit-maximizing. Relevant to the notions of relative and absolute inequality are models of how individuals avoid inequity.

Consider N individuals indexed by i, where i is an element from 1 to N. Also, denote $Y = (Y_1, Y_2, Y_3, \ldots Y_{N-1}, Y_N)$ as a vector of monetary resources respectively associated with each individual i. We similarly denote j as all other individuals in the population i_{-1} not equal to i. Bolton and Ockenfels (2000) express relative comparison by assuming that individuals derive utility from their own income and their relative share of the income (relative standing). The reference group is the average of all incomes: $U_i = U_i(Y_i, Yi/\sum_j Y_j)$. For tractability of analysis, assume for this example, that we are comparing two individuals only, say i and j. Denote a linear-quadratic utility function: $U_i = s_i Y_i + (r_i/2)[(Y_i/(Y_i + Y_j)) - 0.5]^2$. The coefficient is greater than or equal to zero s_i and r_i is less than zero. This first term shows that individuals' utility increases with their own income level. However, this effect is mediated by their relative ranking. Individual i's satisfaction level goes up with their share of income when their share is below 50 per cent. Given the concave nature of this preference model, however, utility decreases with their relative share when this share is 50 per cent. In contrast, Fehr and Schmidt (1999) proposed an absolute difference model. The

utility function is represented by: $\mathbf{U_i = Y_i - [d_i \sum_{j \neq i} max\{Y_j - Y_i,0\} - e_i \sum_{j \neq i} max\{Y_i - Y_j,0\}]/(N-1)}$. The second and third terms in this expression assume that the distaste for advantageous inequality (third term) is less than the disutility from disadvantageous inequality (second term). The poor rather than the rich are more sensitive to changes in inequality. More inequality will lead to intensified support for redistribution. However, note that for a rich individual, the jump in inequality is concentrated from below (i.e. higher weight d). On the other hand, from the perspective of a poor individual, greater inequity is concentrated from above (i.e. higher weight e). Because disadvantageous inequality (i.e. envy) is weighted more than altruism, a poor person will have greater demand for redistribution than somebody who is richer.

The two models above predict that utility is conditional on both individual incomes and on the difference between an individual's own income and that of others. They yield similar theoretical predictions. However, it is important to note that their implications may differ under settings where there are more than two individuals. Only the model of Fehr and Schmidt (1999) predicts that individuals avoid inequality in all outcomes, that distaste for any form of inequality is all-encompassing for everyone. The predictions of Bolton and Ockenfels (2000) may be different when there are multiple players. This is because their model is not sensitive to *all* (i.e. any kind of) disparities in payoffs. Bolton and Ockenfels want the *average* income of other individuals to be as close as possible to their own income (i.e. the reference group is the average). As their frame of comparison is the average income, they do not assume dislike of the existence of rich and poor individuals. Utility is solely measured in comparison to the mean income level, and not in comparison to those at the extremes of the distribution. This is different to Fehr and Schmidt, who assume that there is always distaste for inequality and for the existence of rich and poor.

Several extensions are made to the core models above. An example is the quasi-maximin form of preferences proposed by Charness and Rabin (2002), which applies Rawlsian concerns, i.e. concern about the sum of all payoffs and the payoff of the poorest person. Also related to these outcome-based theories are norm-based and identity-based models of social preferences. Extending the additive model of inequity aversion, these models indicate that egalitarian concerns are shaped by one's identity (Chen and Li 2009). Individuals place more weight on the income of their fellow in-group members, and experience lower utility when outsiders become better off. Meanwhile, norm-based models (Andreoni and Bernheim 2009) argue that, because of social image concerns, individuals may signal that they follow the 50–50 norm.

In the next section, we show that experiments are beneficial to testing theories of inequality. For instance, experiments have been carried out on whether the additive model of Fehr and Schmidt or the ratio model of Bolton and Ockenfels predicts behaviour better. Most observe that absolute income has greater predictive power than relative comparisons (Engelmann and Strobel 2004; Fehr and Schmidt 2006; Leibbrant and Lopez Perez 2012).

4 Testing rational choice and behavioural theories with experiments

Given the opposing views from neoclassical and behavioural theories, this section suggests experimentation as an important tool in a pluralistic approach. Economic experiments can test whether observed behaviour is consistent with predictions (Villeval 2007). If there are deviations from standard theories of rationality, they may shed light on the psychological mechanisms underlying such deviation. Data gathered from a controlled experiment can be used to develop and improve theoretical models. Experiments avoid problems encountered in econometric studies such as omitted variable bias and endogeneity. Econometric analyses are dependent on the quality of data used. Recall the mixed and inconclusive empirical results from work testing neoclassical

models of inequality. Findings are dependent on the periods of study and scope of countries included. If there are missing data, findings can change drastically. Meanwhile, with experiments, the impact of one variable on another is, in theory, straightforward to understand.

Given the immense literature on distribution games, we focus our discussion here on economic experiments that are explicitly used to compare relative and absolute income. Two canonical games are pertinent to fairness concerns: the ultimatum bargaining game and the dictator game:

The ultimatum bargaining game goes back to Guth et al. (1982). It assumes that there are two players: a 'proposer' and a 'responder'. With a fixed amount of money, say €10, the proposer is tasked with suggesting a division of the €10 between him/her and a responder. The offer of the proposer for himself/herself and the responder must be non-negative. After learning the offer of the proposer, the responder either accepts or rejects it. If the responder rejects the offer, the responder and proposer both get zero. If the responder accepts, then the responder will get the allocation suggested by the proposer. Standard game theory predicts that the proposer will offer the smallest positive amount possible (i.e. a positive amount just over zero), and that the responder will accept. Doing so will make them both better off in comparison to getting nothing.

The dictator game is like the ultimatum game, except that there is no strategic interaction between the 'recipient' (responder) and the 'dictator' (proposer). Only the dictator has the power to make decisions, while the recipient is passive. In most studies, dictators are asked how much money they are willing to give to another person (Fehr and Schmidt 2006). Standard game theory predicts that individuals have the incentive to give nothing. Profit-maximizing behaviour entails that they keep all the money for themselves. Therefore, their answer is the measure of their degree of altruism (i.e. answers greater than zero) and their concern for fairness (i.e. responses approaching an egalitarian 50–50 split). For example, the framing of the dictator game is usually of the following form: 'You are matched randomly with an anonymous recipient. We are giving you €10. How much of the €10 are you willing to donate to an anonymous recipient? The rest is for you to keep for yourself. Whatever you do not donate is the real money you will receive at the end of the experiment. Your answers will remain confidential and identity kept anonymous'. Income distribution is solely done by the dictator in the dictator game. This is in contrast to the ultimatum game where there is strategic interaction and final allocations are determined by the actions of both players.

According to Guth and Kocher (2014), as of 2014, there were around 24,000 Google searches for 'ultimatum bargaining' and more than 2,650 citations of Guth et al.'s (1982) seminal paper. Guth and Kocher (2014) and Engel (2011) offered comprehensive reviews of the ultimatum game and the dictator game, respectively. In general, individuals deviate from rational choice. On average, they do not adhere to selfish, profit-maximizing behaviour. People behave altruistically. For the ultimatum game, Levitt and List (2007) noted that most laboratory experiments exhibit a far more equal allocation, with offers ranging from 25 per cent to 50 per cent (i.e. supporting the theoretical predictions of Fehr and Schmidt 1999 and Bolton and Ockenfels 2000), and respondents most likely to reject offers lower than 20 per cent of the fixed endowment. They implied that actions of the proposer can be interpreted as their degree of fairness, while the decision of the responder can be a measure of their dislike for inequality or desire to punish unfair offers. As for dictator games, Levitt and List (2007) found that 60 per cent of experimental subjects donate a positive amount of money, with average transfers of approximately 20 per cent. Recall that the amount of money a dictator gives is a measure of the dictator's fairness preferences or aversion to inequality.

Stake size experiments investigate the extent to which people change their behaviour when monetary stakes are increased. Consider the ultimatum game in this manner. Responders may be more willing to reject unequal offers when the opportunity cost is low (i.e. the fixed amount to be

divided is small and they get zero when they reject an offer). Intuition implies that when stakes are higher, however, responders can be more reluctant to reject large offers. For instance, individuals might be willing to forego an offer of 10 per cent of €10, but many will accept 10 per cent of €10 million instead of both players getting zero. In the absence of stake size effects, individuals should be indifferent about these two offers, which are proportionately equivalent (both are 10 per cent). Following this intuition, the presence of stake size effects can influence absolute and relative inequality. If there are no stake size effects, rejected offers should be the same proportional amount for €10 or €10 million, i.e. if below €1 is the mean rejected offer for €10 (10 per cent), then offers of less than €1 million (10 per cent) are expected to be rejected when the money at stake is €10 million. If we first play a game over €10, and then a game over €10 million, and there are no stake effects, absolute inequality will increase between the first and second games, while relative inequality will remain the same. If we play the same two games and stake size effects are present, the first offer may be rejected (so both players get zero) and the latter is accepted: i.e. both absolute and relative inequality increase between game one and game two. The same logic applies to the effect of stake size on dictator games.

The literature offers mixed conclusions about the impact of stake size on distributive preferences. Using student samples, and predominantly in the USA, previous laboratory experiments on dictator games found that transfers were not affected by endowment (Carpenter et al. 2005; Forsythe et al. 1994). Others provided support for higher stakes causing a less than proportionate increase in transfers observed in dictator games (List and Cherry 2008). Forsythe et al. (1994) increased the dictator endowment from US$5 to US$10, while Carpenter et al.'s (2005) stake size experiments on both dictator and ultimatum games compared behaviour with stakes at US$10 and US$100. List and Cherry, on the other hand, offered larger endowments of up to US$100. As for ultimatum bargaining games, the results remain mixed. Earlier studies on ultimatum games found no significant stake effects (Munier and Zaharia 2002). In their meta-analysis of mostly laboratory experiments on ultimatum games, Oosterbeek et al. (2004) even showed that stake size does not significantly affect the share offered by the proposer but tends to lower rejection rates by responders. When a higher amount of money is involved, respondents are likely to accept the offer rather than both players getting zero. In another paper by List and colleagues, they considered the case of a non-Western developing country and executed a field experiment in India (Andersen et al. 2011). While offering money comparative to participants' average annual income, they found that offer proportions were significantly lower in the high stakes than the low stakes treatment. Rates of rejection by responders were also lower when there was more money to be allocated. From these studies, it seems that stake effects only become significant in affecting behaviour when monetary incentives are extremely high.

Experiments linking relative payoffs and happiness offer avenues for understanding relative income. As they also deal with social comparisons, they are applicable to both the status-seeking models (Clark and Oswald 1998) on positional concerns and inequity aversion models (Bolton and Ockenfels 2000). To our knowledge, and as discussed by a new paper by Ifcher et al. (2020), a scarce number of such experiments exist. The first set analyse the relative income effect. They hypothesize that when other people's incomes increase relative to one's own income, then subjective well-being goes down. Charness and Grosskopf (2001) are the first to attempt to understand whether relative standing influences individual utility. They linked participants' experimental decisions with their self-reported happiness. They found that there was no strong correlation between satisfaction levels and concern for relative payoffs. However, there was an observed taste for competition and status among respondents. They found a significant association between unhappiness and willingness to decrease others' income below one's own payoffs.

Meanwhile, McBride (2010) provided evidence on how expectations and social comparisons shape aspirations and reported happiness. His laboratory experiment involved each participant playing a

non-strategic penny-matching game against a computer. In each round, participants were informed of the computer's randomized probability of selecting heads or tails. They then chose between heads or tails. The way in which participants learned of their payment at the end of each round varied across treatments: either they got no feedback or they were informed of the average payment of participants by probability type; or they got the average payment of all other participants. After that, they reported their level of satisfaction with the outcome of that given round. Experimental evidence shows that higher individual income has a positive influence on reported satisfaction. McBride (2010) observed that information on others' income (i.e. relative comparison) leads to less satisfaction.

Ifcher et al. (2020) provided a more recent test on the hypothesis of the relative income effect. They extended the work of McBride, stating that while the latter paper offers support for the relative income effect, the measure of subjective well-being is contingent on a particular round's outcomes. They argued that reported happiness may not be caused by income per se (i.e. monetary) but by feelings of relative success (i.e. non-monetary). Taking these points into account, Ifcher et al. (2020) designed an online experiment. They measured self-reported satisfaction before and after an exogenous shock which revealed to participants how many experimental points they and another anonymous participant received. They varied whether each experimental point was converted to real money or not. They observed that participants enjoyed receiving monetized points rather than non-monetized points. However, they also found that individuals' degree of dislike of being 'poorer' than others was equal and of similar magnitude in the monetized and non-monetized treatments. Ifcher et al. (2020) thus concluded there was no compelling evidence that participants in the experiment enjoyed being richer than others. Finally, Clark et al. (2010) also considered comparison income—its effect on effort levels and taste for competition rather than on satisfaction. In their experiment, they observed that it was an individual's rank in the distribution of income (rather than others' average income) that significantly determined work effort. In an extension, Charness et al. (2014) found that when individuals were given feedback on their ranking, they were also more willing to sabotage others.

5 Outstanding issues

We conclude that there is a lack of pluralism across methodologies used in inequality research. In line with a 'behavioural synthesis' strategy (Angner 2019), we outline issues relevant for inequality research: (1) specificity of context especially in developing countries, (2) determination of reference group, and (3) consistency in measurement across methods. First is context. It is important to note that most experiments utilize Western university students as their representative sample. This implies that the conclusions of most experiments are driven by individuals who are not necessarily representative of the general population even in high-income Western countries. As in Levitt and List (2007), we argue that laboratory experiments should be complemented by results from fieldwork in developing countries where poverty and inequality are pressing issues. It is necessary to understand the local background upon which respondents' decisions may be contingent. Excellent examples are cross-cultural experiments by Henrich et al. (2004) and Briq research institute's global evidence on preferences (Falk et al. 2018). We also argue for focused consideration of the role of identity. While papers such as the one by Chen and Li (2009) test the effect of identity on preferences, most do so by constructing artificial groups in student samples (i.e. categorizing students by preferred style of art). For generalizability of results, we suggest fieldwork that investigates how real identities (e.g. across racial groups or political lines) affect behaviour in reaction to absolute and relative inequality. This, again, may be especially relevant in developing countries and regions with comparatively high levels of ethnic fractionalization.

Another improvement would be measuring inequality from a normative perspective. Most studies assume a comparative point of view where perception of inequality is affected by one's status compared to others. One consideration is Alesina and Giuliano's (2011) categories of normative inequality. The first category is in a similar vein to the Charness and Rabin (2002) model. The ideal distribution of income is Rawlsian and what is maximized is the payoff of the poorest segment of society. The second is also related to the Charness and Rabin model and concerns efficiency where the total group income is maximized. Slightly along the lines of Fehr and Schmidt (1999), the third is denoted as 'communist', where the final income is everyone is equal. With respect to comparing relative and absolute inequality, we are mostly intrigued by the Rawlsian perspective. If the comparison group is the poorest member instead of the average individual, how will redistributive preferences change? Given this, we turn to the second issue: the identification of a reference group.

Perceptions of inequality differ depending on whom you are comparing yourself to, i.e. the reference group. In rational choice models (Meltzer and Richards 1981), the results are driven by the median voter. The results are conditional on the assumption that income distribution is skewed to the right, i.e. average income is above the median income. Without this argument, the theoretical predictions will not hold. The same is true for some behavioural models (Bolton and Ockenfels 2000) and some status-seeking models (Clark and Oswald 1998) where results are dependent on the average income of the group. Following this argument, what will happen to the theoretical and empirical findings if we consider the poorest, for instance, as the comparison group? We recommend the strategy of Hvidberg et al. (2020) in considering multiple reference groups. In their survey, they varied the reference group against which respondents compared themselves. The reference groups differed in their degree of closeness to the respondent. They observed that respondents viewed inequality as being unfair within their co-worker and educational group. Depending on the reference group considered, it would be interesting to know how people will underestimate inequality (Hauser and Norton 2017).

Finally, there is a gap in measurement: theory vs. empirics, and surveys vs. experiments. It would be ideal if the different methods complemented each other's strengths and weaknesses, and the ability of researchers to link theoretical and empirical findings would be relevant. The answer to whether inequality increases both redistribution and satisfaction depends on the method of comparison (i.e. absolute versus relative). We argue that the form of redistributive preferences in theoretical models should not be ignored by anyone interested in inequality. The determination of a suitable form to model relative concerns (especially whether reliant on status or fairness) should not only matter for theorists. Theoretical models should be studied carefully by experimentalists and econometricians. Improved clarity in theoretical hypotheses will strengthen empirical strategies. This will support better understanding of which social policies may prove effective in alleviating inequality.

We move to inconsistencies between experiments and surveys on absolute and relative inequality. The results from incentivized experiments (i.e. revealed preferences) differ from those found in hypothetical surveys. Stated preferences (e.g. surveys without monetary incentives) are sometimes better predicted by models with income differences expressed in relative terms (Johansson-Stenman et al. 2002). What remains puzzling is why the opposite result occurs for distribution experiments where absolute income models have higher predictive power than relative difference models (Leibbrant and Lopez Perez 2012). These are also relevant for happiness research, which relies on hypothetical surveys asking whether relative income decreases life satisfaction (Clark et al. 2008). When it comes to surveys on happiness, an absolute increase in income does not always lead to more satisfaction; what sometimes matters is one's relative income compared to someone else's. People strive for status and gain more satisfaction when they are better off than others. Consequently, the rich may be happier than the poor. This gap in stated preferences and observed behaviour calls for more investigation into how inequality is conceptualized. What is also

important to understand is that experiments that test the hypothesis of Fehr and Schmidt's (1999) absolute model assume that people are averse to any type of inequality. Their utility decreases when there are unfair outcomes, regardless of whether inequality is advantageous or disadvantageous to them. Happiness surveys consider different assumptions from that experimental research. Surveys on life satisfaction and income distribution assume that well-being depends positively on relative happiness (i.e. when one is richer than the mean). They note, however, that happiness is negatively associated with relative deprivation (i.e. when an individual is poorer than the average).

There are also other puzzles triggering our curiosity. Can reported answers predict actual behaviour? Also, how can we explain contradictions between theoretical predictions and empirical findings? Is there a way to relate rational choice models to behavioural models? A few studies have attempted to solve these questions. For instance, Cardenas et al. (2013) attempted to understand whether there is consistency between revealed preferences in incentivized experiments and stated actions in hypothetical surveys. They provided a link between answers in social capital surveys and actual behaviour in social preference experiments. In addition, recent advances in laboratory experiments have given the possibility of testing theory. For instance, Agranov and Palfrey (2015) designed a laboratory experiment to test the MR model. They did so by varying the level of wage inequality and the political institution which determined tax rates. They observed that higher inequality led to higher tax rates, and this result was robust to whatever kind of institution was involved. Agranov and Palfrey (2015) proposed a new theoretical model. They extended MR's rational choice model and incorporated social preferences, and found that their experimental data was consistent with the predictions of the neoclassical model of MR. Meanwhile, in a simplified, static environment, Jimenez-Jimenez et al. (2020) tested the model of Alesina and Angeletos (2005). Using real-effort task and leisure time involved, they analysed redistribution decisions in a voting experiment. For a high level of wage inequality, they confirmed the hypothesis of Alesina and Angeletos (2005) on meritocracy. Finally, there are theoretical works which extend rational choice models by incorporating psychological components. An example is Galasso (2003), which extended the MR model. Instead of the median voter as the decision maker, they assume that inequality-averse agents are the ones who determine redistribution. The diversity and improvement of theoretical models is an excellent example of how behavioural and neoclassical economists can cooperate (Rabin 2013).

Using examples from inequality research, we have shown the relevance of 'behavioural synthesis', i.e. the reconciliation between behavioural economics and rational choice theory. When possible, it would be valuable for future research to test theories using survey and experimental data. Behavioural deviations can be used to update neoclassical models. To design better policies for reducing inequality, we thus call for a pluralistic approach.

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