Segregation, Misperceptions and Demand for Redistribution[*] Research paper for Momentum18: Klasse[†]

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1 Introduction

Research shows that socio-economic segregation is on the rise in many industrialized countries. People tend to increasingly live, work and go to school with people of similar economic and cultural background, education, and political views.

This tendency towards increased social segregation could pose problems for society for several reasons: To begin with, it can contribute to the division and polarisation of societies and endanger social cohesion, because it hinders mutual understanding (as expressed in the votes for Donald Trump and Brexit, but also in the Austrian presidential elections of 2016 and the parliamentary elections of 2017).

Segregation also plays an important role in societies' levels of economic inequality. Firstly, due to "network effects": rich people prosper not only because of their own high income, but also thanks to their affluent neighbourhoods and important connections. Similarly, much poorer people may be at a disadvantage not only because of their low incomes, but because of their often-deprived surroundings, inferior schools and lack of influential contacts.

In this article I want to emphasize a second, indirect way in which segregation can affect inequality: social segregation can heighten misperceptions about the state of society, and thus affect citizens' support for certain policies such as income redistribution and expansion of the welfare state. This can lead to an increase in (post-tax) income inequality.

Studies show that people at both ends of the income distribution tend to underestimate income and wealth inequality and wage differentials and tend to think they are closer to the middle of the income distribution than they actually are (see for instance Norton and Ariely (2011), Cruces et al. (2013), Fessler et al. (2016)). In this paper I want to highlight the role of segregation in these misperceptions: If people interact predominantly with people who are similar to themselves, they will lose sight of society and the economy as a whole and form biased beliefs about people outside their social circle.

I report the results of a quantitative survey I conducted in the US which indicates that people's biases are connected to their degree of socio-economic segregation: People with very homogenous social circles, who interact mainly with people similar to themselves in terms of economic circumstances or education, tend to be more biased about the shape of the income distribution than people with diverse social contacts. Since they are less aware how different people outside their circle are, they are inclined to conclude that most people are like them. This encourages richer people to think the poor are not as poor as they actually are, while poorer people don't realise how rich the rich are - segregation makes everybody in society underestimate inequality levels.

I then introduce a theoretical Political Economy model about voting for redistribution to show that people's misperceptions have important implications for demand for redistribution in society. In this model the above described misperceptions imply that poor people tend to want less redistribution than if they were unbiased: Because they underestimate how much money people at the top end of the income distribution make, they don't realize how much they could gain from redistribution.

The full implications of this phenomenon become clear once we note that segregation and inequality tend to move jointly: several studies for the US show that both income inequality and segregation have increased in most metropolitan areas over the past 40 years (Forman and Koch (2012)). It seems that inequality at the top has increased, with the rich increasingly segregating away from the rest, while "middle-class neighbourhoods" have shrunk (Fry and Taylor (2012)). The fact that segregation is connected to misperceptions has important consequences for demand for redistribution in times of rising inequality. For example, if inequality increases, people might fail to notice this increase – or the extent of it – due to segregation, meaning their support for redistributive policies doesn't increase accordingly. In the extreme, segregation and misperceptions could even lead to people thinking that inequality has decreased, because they dont observe what is going on outside their social circle. As a result, poor people would in fact seek less redistribution than before the increase in inequality.

The rest of this paper is organized as follows: Section 2 discusses empirical evidence on segregation and misperceptions, and on how the two are connected. Section 3 introduces a simple model where society is segregated and people vote for redistribution and demonstrates that an increase in inequality can, due to segregation and resulting misperceptions, lead to a decrease in demand for redistribution. Section 4 concludes by discussing the origins of segregation and potential policy measures to counteract segregation and resulting misperceptions.

2   Segregation and Misperceptions: Evidence and Theory

Empirical evidence suggests that (socio-)economic segregation has increased in many industrialized countries over the last decades. For instance, Reardon and Bischoff (2011) demonstrate the increase in segregation in the US in the period from 1970-2000, and there is similar evidence for the UK.[1] Furthermore, the same research also finds that segregation and inequality often move jointly.[2]

There is a growing empirical literature on people's misperceptions of the income distribution. Cruces et al. (2013) find that poor people in Buenos Aires overestimate their relative position

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[1] For instance, see https://www.opendemocracy.net/wfd/ted-cantle-and-eric-kaufmann/is-segregation-on-increase-in-uk

[2] In Windsteiger (2018) I develop a theoretical model that can be a potential explanation for this correlation: I show that offering people the possibility to segregate into groups becomes more profitable for the supplier as inequality increases.

in the income distribution, while rich people underestimate it. They also show that this lowers poor people's demand for redistribution: when their biases are corrected, poor people's demand for redistribution increases. Importantly, they additionally show that (geographical) economic segregation affects people's misperceptions. Karadja et al. (2015) conduct a similar study for Sweden and find that a majority of people there tend to underestimate their relative position. Norton and Ariely (2011) and Norton et al. (2014) find that people in the US and Australia tend to underestimate income and wealth inequality and Kiatpongsan and Norton (2014) find that people underestimate pay differences between different professions. Interestingly, misperceptions about certain economic issues are sometimes found to differ between countries: Alesina, Stantcheva and Teso (2018) show that Europeans tend to underestimate social mobility, while Americans in general overestimate it. Finally, it is important to note that misperceptions about society are, of course, not only limited to economic matters: For instance, a recent working paper by Alesina, Miano and Stantcheva (2018) shows that people hold severe misperceptions about the number and characteristics of immigrants.

2.1   The connection between segregation and misperceptions

Recently, the fact that segregation can affect beliefs has gained attention in the literature: For instance, Golub and Jackson (2012) present a model in which homophily (and resulting segregation) slows down convergence to a consensus in society. That (potentially biased) beliefs can, in turn, have an effect on segregation, is pointed out by Dustmann and Preston (2001). They argue that estimating the effect of living in ethnically diverse neighbourhoods on attitudes towards minorities can lead to biased results, if we do not take into account how those attitudes affect neighbourhood choices in the first place. Levy and Razin (2017) present a model in which beliefs about school quality and parent's school choice for their children interact to create essentially two groups of society: a group of privately educated parents who believe in the benefits of the private school system and send their children to private school as well, and a group of state educated parents, who think private schools are not worth paying for and send their kids to state schools.

The empirical evidence on the connection between socio-economic segregation and misperceptions about society is relatively sparse. Cruces et al. (2013) examine the relationship between people's belief about their own position in the income distribution and their area of residence, and find that people who live in predominantly poor areas tend to overestimate their relative position, whereas people living in rich areas tend to underestimate it. Algan et al. (2015) show that political views converge among peers at university, and Boisjoly et al. (2006) and Burns et al. (2013) find that having roommates of a different ethnicity to one's own lowers students' prejudices. Alesina, Miano and Stantcheva (2018) find that personally knowing immigrants lowers wrong perceptions about immigrant characteristics.

In February 2016, I conducted my own empirical study on the link between segregation and misperceptions: I ran an online survey on 600 US citizens above the age of 18, which was distributed via Amazon Mechanical Turk. The original questionnaire can be accessed at `https://lse.ut1.qualtrics.com/jfe/form/SV_eDLNkeGfQg2ycM5`.

By conducting this survey, I wanted to address two main questions:

1. Is there evidence that people misperceive the shape of the income distribution, and if yes in what way?

2. Are people with a diverse social circle (i.e. people who are not very "segregated") less biased?
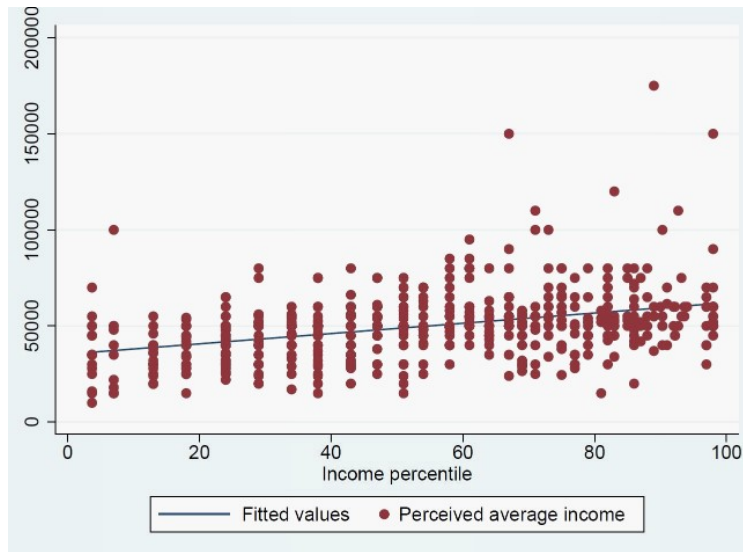
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Figure 1: People's estimate of average income is increasing in their own income

To tackle the first question, I asked people about their own household income and their estimate of average US household income. Figure 1 plots the relationship between the two: It turns out that people's estimate of average household income is increasing in their own income, and that in general, poor people tend to underestimate average household income, while rich people tend to overestimate it.

I elicited respondents' individual degrees of segregation by asking about the diversity of their social interactions. In particular, I asked them about their friends and colleagues, and how many of them have similar respectively different levels of household income and education. Then I employed a scale from 0 to 4 to classify respondents as more or less segregated (4 indicating the highest possible degree of segregation) concerning those social circles, depending on how similar their work colleagues respectively friends are to themselves. Subsequently, I used factor analysis to identify a common factor out of these categorical response variables.

I find that the severity of misperception of average income is correlated with the degree of social segregation: poor people tend to underestimate average household income less and rich people tend to overestimate it less if their social circle is more diverse. Table 1 shows the results of regressing people's bias about average income (in relative terms)[3] on their own income percentile, the degree of social segregation as measured by common factor identified by factor analysis and the interaction between own income percentile and the factor: Misperceptions of average household income are less severe for respondents with more diverse social circles.

Furthermore, I asked the so-called "Lin position generator" question in the version of the "Great British Class calculator"[4], which is the short version of a similar question asked in the Great British

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[3] The variable *Bias* is the difference between the respondent's estimate of average income and true average income as a fraction of true average income. A positive value of *Bias* thus means average income is overestimated.

[4] see http://www.bbc.co.uk/news/magazine-22000973

Table 1: Regression results for social segregation as measured by factor analysis

	Bias
Income percentile	0.0044
	(0.0006)
(Income percentile) x (Social segregation)	0.0024
	(0.001)
Social segregation	-0.073
	(0.060)
Intercept	-0.598
	(0.041)
N	509

Standard errors in parentheses

Class Survey (see Savage (2015)).[5] This question tries to identify the diversity of the respondent's social circle by asking whether she socially knows people with certain occupations (eighteen different occupations), ranging from chief executive to cleaner. I measure diversity of the social circle by assigning to each of the occupations their status rank using the Cambridge Social Interaction and Stratification (CAMSIS) scale score (where low numbers correspond to high rank) and then calculating for each respondent the standard deviation of all the scores of occupations she knows: the higher this standard deviation, the more diverse can the respondent's social circle be assumed to be. Regressing the absolute value of people's misperception of average income in relative terms (variable *Bias2*) on the standard deviation yields significant results and the coefficient has the expected sign: A more diverse social circle corresponds to less bias about average household income (see Table 2).

Table 2: Regression results for social diversity as measured by CAMSIS score standard deviation

	(1)	(2)
	Bias2	Bias2
Social circle status diversity	-0.0107	-0.00916
	(0.0037)	(0.0037)
Income percentile		-0.00181
		(0.0005)
Intercept	0.483	0.568
	(0.031)	(0.0388)
N	591	591

Standard errors in parentheses

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[5] The question is named after the sociologist Nan Lin who developed it in the 1980s.

3 Misperceptions, inequality and demand for redistribution

In this section, I want to briefly scetch a model in which people are segregated into groups according to income and as a result misperceive the shape of the income distribution. I want to use this simple model to demonstrate how demand for redistribution in society is affected by segregation and resulting misperceptions and show that an increase in inequality has very different implications in this model compared to "standard" models. The model outlined here is a simplified version of a more complex model explained in detail in Windsteiger (2017). All the step-by-step derivations of the below stated results can also be found there.

In Windsteiger (2017), I develop a framework for segregation according to income if people hold misperceptions about the income distribution. This model explains, how groups form in society and what the equilibrium partition of society will look like. For the present article, I want to abstract from this elaborate model and just take the partition of society as given, without explaining where it comes from.

Suppose therefore that income in the economy is distributed according to an income distribution $F(y)$, on the interval $Y = [0, y_{\max}]$. Assume furthermore that $F(y)$ is continuous and strictly monotonic. As $F(y)$ is an income distribution, I will also assume that $F(y)$ is positively skewed (meaning that the median income is smaller than the average income). Suppose that society is split into two groups: everybody who earns above some cutoff income $\hat{y}$ is in the rich group, everybody who makes less than income $\hat{y}$ is in the poor group. Finally, suppose that people interact mainly with other people in their own group and do not regularly meet members of the other group. As a result, they hold misperceptions about the other group, specifically about average income in the other group. I will model a group's belief about average income in the other group as a function of how the groups in society look like, which can be uniquely characterized by the cutoff $\hat{y}$. For simplicity of exposition, I will use a particular type of belief function for the following analysis. It is however not necessary that the misperceptions are of exactly of the form specified below in (1) and (2).

Suppose the belief function is such that people in the poor group think that average income in the rich group is

$$\bar{E}_p(\hat{y}) = \beta(1 - F(\hat{y}))\hat{y} + (1 - \beta(1 - F(\hat{y}))\bar{E} \tag{1}$$

and people in the rich group think that average income in the poor group is

$$\underline{E}_r(\hat{y}) = \beta F(\hat{y})\hat{y} + (1 - \beta F(\hat{y}))\underline{E}. \tag{2}$$

The parameter $\beta \in [0, 1]$ describes the "naivity" of agents - if β is 0, agents have no misperceptions, if β is 1 people are maximally biased for any cutoff $\hat{y}$. People's belief about the other group's average income is thus a weighted average of the correct average income and the cutoff income $\hat{y}$: The poor know that everybody in the rich group earns more than $\hat{y}$, but they think that the majority of people in the rich group are closer to the cutoff income than they actually are. Analogously, the rich know that people in the poor group earn less than $\hat{y}$, but they overestimate the amount of people who earn income close to the cutoff.

People can interact freely with members of their own group. I will therefore assume that people are correct about average income in their own group and denote by $\underline{E}(\hat{y})$ the true average income in the poor group (i.e. $\underline{E}(\hat{y}) = E[y|y < \hat{y}]$) and by $\bar{E}(\hat{y})$ the correct average income in the rich group ($\bar{E}(\hat{y}) = E[y|y \geq \hat{y}]$). It is straightforward to see that $\bar{E}_p(\hat{y}) < \bar{E}(\hat{y})$ and $\underline{E}_r(\hat{y}) > \underline{E}(\hat{y})$ for all $\hat{y} \in (0, y_{\max})$, i.e. the poor underestimate average income in the rich group and the rich overestimate average income in the poor group for any interior cutoff. (In the next section I will

argue that this implies that the poor underestimate overall average income in the economy, while the rich overestimate it, which is what I find in my survey as described in Section 2.1.) Furthermore, I require misperceptions to be constant within groups, such that people who are in the same group have the *same* misperception about the other group's average (and thus misperceptions do not depend on one's own income directly, but on group membership).[6]

Misperceptions of this type could arise in the following way: As people live in their segregated communities, they see mostly people who have income similar to their own (i.e. people from their own group). They do sometimes meet people from the other group, but they are not aware that most of the time they do not meet a representative sample of the other group (because they are more likely to meet people from the other group who are close to the cutoff). They see the average income in their own group, but what matters for their sorting decision is also the average income in the other group, which they do not see. Because they know the cutoff $\hat{y}$ and the overall range of y (i.e. that y ranges from 0 to $y_{\max}$), they know that the average income of the other group lies somewhere between the cutoff $\hat{y}$ and 0 resp. $y_{\max}$. However, as they neglect the fact that they often do not meet a representative sample of the other group and are rather more likely to meet people very close to the cutoff, the poor think that average income in the rich group is closer to their own average than it actually is, and the same holds for the rich when thinking about the poor group's average. In short, people below the cutoff *underestimate* average income in the rich group and people above the cutoff *overestimate* average income in the poor group. [7]

3.1 Inequality and the demand for redistribution

In the following section, I analyze people's desired tax and redistribution rates in my model. Specifically, I examine what degree of income redistribution society will decide on via majority voting. For reasons of simplicity, I assume that only linear taxation is available, but all findings below could be reproduced in an analogous way with progressive redistribution.[8]

With linear redistribution, everybody in the economy has to pay a proportional tax t and the government redistributes the proceeds equally among all its citizens afterwards. Hence, a person with pre-tax income of y_i has after-tax and after-redistribution income

$$(1 - t)y_i + \tau(t)E,$$

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[6] I restrict my attention to misperceptions that are constant within a group because I specifically want to focus on differences in perceptions *between* groups rather than *within* groups. This restriction helps to simplify the analysis, but the main results of this paper would not change fundamentally if biases were to vary also within groups. The restriction can be deduced "naturally" from the assumption that people interact and communicate freely within their own group and hence will, within their group, reach a common belief about the other group.

[7] The specific form of misperception that I use in this paper can be microfounded in the following way: People in the poor group only sometimes encounter a representative sample of the rich (e.g. if they go to the opera, watch a royal wedding or shop in a fancy store) and the rest of the time encounter only rich people who are very close to the cutoff (basically at $\hat{y}$), maybe because they are parents of their kids' school friends (upper-middle class families sometimes prefer to send their kids to state schools). However, people are not aware of this and therefore estimate average income as if they were observing a representative sample of the other group. The particular functional form of the bias can arise if the frequency of meeting a representative sample of the other group depends on the size of the own group, $F(\hat{y})$. This could be because "meeting a representative sample" does not actually require personal encounter but also comprises accounts from other people who are in one's own group. Then if people from different groups meet each other at a certain rate, the group with the bigger mass has a better understanding of the other group because people learn from others in their own group.

[8] This would, however, require making additional assumptions on how people perceive the shape of the income distribution.

where E is average income and the function $\tau(t) \leq t$ accounts for the fact that there is a deadweight loss of taxation.[9] To facilitate the analysis, suppose that people vote to decide on the tax rate, and that they care only about their own post-tax income.[10]

Let me first demonstrate what happens in a "standard" model, where people do not misperceive the shape of the income distribution. Meltzer and Richard (1981) have examined the relationship between inequality and the demand for redistribution in this model: If people are unbiased about the shape of the income distribution, a person with income y_i - when voting for the redistribution rate - will simply choose the tax rate t that maximizes her post-redistribution income. In this simple model with linear redistribution, nobody who earns above average income will want redistribution (so their optimal tax rate would be 0), but the optimal tax rate for people who earn below average income is always positive. However, due to the resulting deadweight loss of taxation, nobody's optimal tax rate is 1 (i.e. full redistribution). In fact, a person's optimal tax rate is always decreasing in the ratio of her own income to average income - the closer a person's own income is to average income, the less she can gain from redistribution and therefore the smaller her optimal tax rate.

The tax rate determined by majority voting (what I will sometimes call "demand for redistribution" in this paper) is the median earner's optimal tax rate.[11] This tax rate is decreasing in the "equality ratio" $\frac{y^M}{E}$, the ratio of median to mean income. This means that in this simple, "standard" model without misperceptions, the tax rate determined by majority voting is higher, the larger the difference between median and mean income in the economy.

The intuition for this result the following: The ratio $\frac{y^M}{E}$ can be regarded as an, albeit rudimentary, measure of the degree of income equality in society. If the ratio is small, this means the difference between median and mean income is large and the income distribution has a large positive skew with a majority of people earning income below average and a few very rich people. Therefore, income inequality is high, poor people (who are the majority) can benefit a lot from redistribution and the redistribution rate determined by majority voting will be high. If, on the other hand, the equality ratio $\frac{y^M}{E}$ is large, then this means that median income is very close to average income and the income distribution is almost symmetric, with most people being middle-class and only a few at the bottom and the top of the distribution. Therefore, the majority of people will not benefit much from redistribution and will therefore not vote for a high redistribution rate - demand for redistribution will be low.[12]

To analyze people's demand for redistribution in my model, where they misperceive the income distribution, we need to establish what their perception of average income is. People's optimal tax rate depends on (what they think) they could gain from redistribution, and thus on how close (they think) their own income is to average income. If people would correctly perceive both average income in their group and average income in the other group, they could simply calculate overall

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[9] Let $\tau(.)$ be such that $\tau(t) > 0 \ \forall t \in (0,1)$, $\tau(0) = 0$, $\tau''(t) \leq 0$, $\tau(1) = 0$, $\tau'''(t) \geq 0$ [this guarantees that $\tau'(t)$ is convex and hence also τ'^{-1} is convex, given that τ' is decreasing].

[10] Assuming that people, in addition to their own income, care also about the degree of inequality in society would not change the qualitative results of my model. In fact, the results in Section 3.2 would be stronger, because poor people would want even less redistribution in that case, because they underestimate inequality.

[11] This follows from the fact that preferences are single-peaked, see Downs (1957)

[12] If the equality ratio would be larger than one, this would mean that median income is larger than average income, i.e. that the majority of people earn more than average income. Then the redistribution rate determined by majority voting would be 0, because the majority of people would oppose redistribution. Technically, I have excluded this possibility here because I have assumed that the income distribution is positively skewed (see Section 3), which is always the case for the overall income distribution of a country.

average income using the fact that

$$E = F(\hat{y})\underline{E}(\hat{y}) + (1 - F(\hat{y}))\bar{E}(\hat{y})$$

for any cutoff $\hat{y}$.[13] However, if there is economic segregation and people misperceive average income in the other group, they mis-estimate overall average income. Specifically, poor people think that average income is

$$E_p(\hat{y}) = F(\hat{y})\underline{E}(\hat{y}) + (1 - F(\hat{y}))\bar{E}_p(\hat{y}) < E.$$

Because they correctly perceive average income in their own group and underestimate average income in the rich group,

$$\bar{E}_p(\hat{y}) < \bar{E}(\hat{y}),$$

they end up underestimating overall average income. Analogously, rich people overestimate average income,

$$E_r(\hat{y}) = F(\hat{y})\underline{E}_r(\hat{y}) + (1 - F(\hat{y}))\bar{E}(\hat{y}) > E.$$

Let me for simplicity of exposition assume that the cutoff income $\hat{y}$ is at average income (E), such that everybody who earns above average income is in the rich group, and everybody who makes below average income is in the poor group.[14] This implies that the median earner is in the poor group (because the income distribution is positively skewed, and thus median income is below average income) and her preferred tax rate depends on the *perceived* equality ratio $\frac{y^M}{E_p}$. Average income as perceived by the poor (E_p) is smaller than true average income (E), hence the median earner's perceived degree of equality as measured by $\frac{y^M}{E_p}$ is higher than without segregation. Therefore, her optimal tax rate is lower in the presence of economic segregation. As the median earner's preferred tax rate is the one that wins in majority voting,[15] this yields the following

Result 1 *The tax rate selected by majority voting in a segregated society where people misperceive the shape of the income distribution as described above is lower than in a society without segregation and misperception of the income distribution.*

The intuition behind this result is the following: Because the majority of people (i.e. the poor group) underestimate average income, they underestimate how much they could gain from redistribution, and are thus less in favour of redistribution than if they would not misperceive the shape of the income distribution.

3.2 The effect of changing inequality on demand for redistribution

What happens to people's (mis)perceptions and the support for redistribution in a segregated society if income inequality increases and how do the effects differ compared to a society without segregation?

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[13]Note that I assume that people know the relative size of their respective group, i.e. they know $F(\hat{y})$ and $1 - F(\hat{y})$. They also know the range of the distribution and where the cutoff lies. They only misperceive the shape of the distribution function in the other group. With the type of bias that I examine here, their perceived income distribution in the other group is more skewed towards $\hat{y}$ compared to the actual distribution.

[14]In Windsteiger (2017), this turns out to be the unique equilibrium partition of society. The above described mechanism works in a similar way for any other partition where the cutoff is above median income.

[15]To be precise: to ensure that the median earner is the decisive voter also in my model with misperceptions, an extra assumption is needed. I will not go into these technical details here, but they are stated in Windsteiger (2017).

In this section I will demonstrate the impact of an increase in inequality in the form of a mean-preserving spread of the income distribution. (This means that average income stays the same, but average income in the poor group decreases and average income in the rich group increases, such that the distance between mean and median income increases.)[16]

In the "standard" model, without segregation and misperceptions, the median earner's support for redistribution increases due to a mean-preserving spread, because median income declines relative to average income and hence the equality ratio $\frac{y^M}{E}$ decreases,

$$\Delta \left(\frac{y^M}{E} \right) = \frac{\Delta y^M}{E} = \frac{\Delta y^M}{y^M} \frac{y^M}{E}.$$

The percentage change in $\frac{y^M}{E}$ is $\frac{\Delta y^M}{y^M}$ (where $\Delta y^M < 0$). This means that the redistribution rate that people vote for, which depends negatively on the equality ratio, increases. Intuitively, as the majority of people become poorer compared to the average, they can gain more from redistribution and hence vote for higher redistribution.

In a segregated society, where people misperceive the shape of the income distribution, the effect of an increase in inequality on the support for redistribution depends on its impact on people's beliefs about the other group's average income. As explained in the previous section, if people are biased due to segregation, the tax rate selected by majority voting depends on the perceived equality ratio $\frac{y^M}{E_p}$, the ratio between median income and average income as perceived by the poor group (i.e. the majority). While average income E does not change due to a mean-preserving spread, I show in Windsteiger (2017) that average income as perceived by the poor group (E_p) declines. The poor feel that average income declines because they experience the decline of average income in their own group fully, but only partially take note of the compensating increase in average income among the rich. Hence, they think that society as a whole has become poorer. As a result, the change in the perceived equality ratio $\frac{y^M}{E_p}$ amounts to

$$\Delta \left(\frac{y^M}{E_p} \right) = \frac{\Delta y^M E_p - y^M \Delta E_p}{(E_p)^2} = \left(\frac{\Delta y^M}{y^M} - \frac{\Delta E_p}{E_p} \right) \frac{y^M}{E_p}$$

and thus the percentage decrease in $\frac{y^M}{E_p}$ is $\frac{\Delta y^M}{y^M} - \frac{\Delta E_p}{E_p}$, which is smaller (in absolute terms) than the percentage decrease of $\frac{y^M}{E}$ in the unbiased case, because average income as perceived by the poor group decreases, and thus $\frac{\Delta E_p}{E_p} < 0$.

Result 2 *If society is segregated and people misperceive the shape of the income distribution as described above, an increase in inequality (in the form of a mean-preserving spread) always leads to a smaller percentage increase in the median earner's perceived inequality than in the absence of segregation and misperception.*

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[16]For simplicity, I will focus on mean-preserving spreads that are such that the mass of people below and above the mean remain the same, but mass shifts from the middle towards the endpoints of the distribution, such that median income declines. Specifically, I will examine the effect of what I call a *monotone* mean-preserving spread of the income distribution, which is such that $\bar{E}(\hat{y})$ increases and $\underline{E}(\hat{y})$ decreases for any cutoff $\hat{y}$. I will also require that the mean-preserving spread is such that $F(E)$ remains unchanged, and I require that the median earner is the decisive voter before and after the change in inequality. See Windsteiger (2017) for conditions that ensure this.

Moreover, in Windsteiger (2017) I demonstrate that there always exists a mean-preserving spread that leads the median earner to believe that society has become more rather than less equal, i.e. that inequality has decreased rather than increased.

Result 3 *There exists an increase in inequality that causes a decrease of the median earner's perceived degree of inequality under segregation.*

The intuition for this result is that, unlike in the non-segregated case, the median earner's perceived equality ratio $\frac{y^M}{E_p}$ can increase due to a mean preserving spread if people are biased, because both median income (y^M) and average income as perceived by the poor (E_p) decline. Hence, the difference between median and perceived average income (and thus the perceived degree of inequality) can decrease. If the mean-preserving spread is such that the median earner's perceived degree of inequality decreases, then also the median earner's preferred tax rate (which is the tax rate determined by majority voting, i.e. "demand for redistribution") must necessarily decrease.

Result 4 *There always exists an increase in inequality such that the tax rate determined by majority voting decreases under segregation.*

Put simply, because people in the poor group don't fully observe what happens to incomes in the rich group, but see average income in their own group decline, an increase in inequality can lead them to believe that overall average income in the economy has declined, and therefore that there is less to gain from redistribution.

In Windsteiger (2017), I derive the condition on the mean-preserving spread that guarantees that demand for redistribution decreases. As I explain above, this condition must ensure that the decline in average income as perceived by the poor (E_p) is larger than the decline in median income (y^M).

This simple theoretical model shows that segregation and resulting misperceptions change the relationship between inequality and support for redistributive policies in society. I have demonstrated that an increase in inequality does not necessarily lead to an increase in demand for redistribution. What matters is voters' *perceived* degree of inequality. If society is segregated and people interact mainly with individuals who are similar to themselves, this can result in misperceptions about the shape of the overall income distribution. Furthermore, an increase in inequality will play out differently than in the absence of segregation and misperceptions: Segregation might prevent people from noticing the full extent of an increase in inequality. In the extreme, people could even think that inequality has decreased. As a result, they would in fact want less redistribution than before the increase in inequality. This mechanism could help to explain why we often observe periods of increasing income inequality that are not accompanied by a parallel rise in demand for redistribution (for example, in the US between 1975 and 2008, when income inequality was on the rise while support for redistributive policies remained constant or even decreased slightly).[17]

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[17] In Windsteiger (2017), I describe how more general changes in the shape of the income distribution affect demand for redistribution if society is segregated. Specifically, I show that the above described situation of increasing inequality accompanied by declining demand for redistribution will be even more likely to occur if the income distribution changes such that the increase in $\bar{E}$ is not enough to offset the decrease in $\underline{E}$ and hence average income declines. Given that I do not model growth in my model, with uniform growth such a situation would translate into an increase in $\bar{E}$ while $\underline{E}$ stays constant, which is what many argue has happened in advanced economies like the US in the past 20 or 30 years (see e.g. Stiglitz (2015)).

4   Conclusion and outlook

Socio-economic segregation can exacerbate inequalities in various ways. Schooling is one prominent example: If children living in affluent areas get better education than children from poor neighbourhoods because their local schools are of a better standard due to high local investment, income inequality in the next generation will be amplified. This effect is specifically pronounced in the United States, where school choice is linked to neighbourhood (see e.g. Chetty et al. (2014)). Moreover, having class mates from rich and influential families might not only have the direct effect on education via better quality of schooling, but might also yield benefits later in life through social connections that lead to better jobs and opportunities (see e.g. Savage (2015)).

In this article, I demonstrate that there is another channel through which segregation can affect economic inequality: Economic segregation, if it leads to misperceptions of the income distribution, can have significant consequences for support for redistribution in society, and hence for (post-tax and post-redistribution) income inequality.

What can be done about this? What are the origins of segregation, and how can we counteract social stratification? At the rich end, spatial segregation seems to be mainly self-imposed via gated communities, security guards, private transport and private schools. In Windsteiger (2018), I hypothesise that in more unequal societies, it is more profitable for firms to offer customers the possibility to segregate, because rich people will be willing to pay more to get away from the poor if inequality is higher and the poor are poorer. At the poor end, meanwhile, it is often a direct consequence of low purchasing power: housing costs and corresponding neighbourhood school quality are big drivers of social segregation.

So what action can be taken to reduce segregation – and will it have a corresponding impact on inequality? Certainly, policies such as improved and safer public transport leading to a broader spectrum of people choosing to travel this way, coupled with congestion charges to disincentivise private (car) transport, could be employed to break down spatial segregation. The trend for more open, pedestrianised areas in cities is another important step.

However, in addition to real-life social segregation in our everyday contacts, we need to be aware that the internet age has brought with it a new facet of social seclusion. Social media, which could in theory be a tool for us to reach out to a diverse crowd, to people who we would not get in contact with otherwise, in fact often achieves just the opposite. The algorithms built into Facebook and other social media platforms create echo chambers where we interact – as in real life – mostly with people who have similar life circumstances and opinions. Instead of diversifying views, our social media bubbles act to solidify our biased beliefs and our selective perspectives on society. In his new book #Republic, Harvard professor Cass Sunstein points out the dangers of this new type of social segregation, which (just like its non-virtual equivalent) often goes unrecognised by the individuals it affects. Sunstein suggests creative private-sector solutions such as "serendipity buttons" – which would expose people to diverse viewpoints or topics they would not otherwise come across – and, as a last resort, government intervention to diversify people's social media feeds and, at least partially, correct their distorted perspectives. Whether or not we want to go down a route of increasing government regulation – both in real and virtual spaces – to combat segregation, social seclusion and the formation of social media bubbles, is an ideological question. However, to enable all of us to make unbiased, informed choices about the type of society we want to live in, it's clear we need to remove the barriers that obstruct our views of that society as a whole.

References

[1] Alesina, A., Stantcheva, S., & Teso, E. (2018). Intergenerational mobility and preferences for redistribution. American Economic Review, 108(2), 521-54.

[2] Alesina, A., Miano, A., & Stantcheva, S. (2018). Immigration and Redistribution (No. w24733). National Bureau of Economic Research.

[3] Algan, Y., Do, Q. A., Dalvit, N., Le Chapelain, A., & Zenou, Y. (2015). How Social Networks Shape Our Beliefs: A Natural Experiment among Future French Politicians. (mimeo)

[4] Boisjoly, J., Duncan, G. J., Kremer, M., Levy, D. M., & Eccles, J. (2006). Empathy or antipathy? The impact of diversity. The American economic review, 96(5), 1890-1905.

[5] Burns, J., Corno, L., & La Ferrara, E. (2013). Does interaction affect racial prejudice and cooperation? Evidence from randomly assigned peers in South Africa. Unpublished working paper.

[6] Chetty, R., Hendren, N., Kline, P., & Saez, E. (2014). Where is the land of opportunity? The geography of intergenerational mobility in the United States. The Quarterly Journal of Economics, 129(4), 1553-1623.

[7] Cruces, G., Perez-Truglia, R., & Tetaz, M. (2013). Biased perceptions of income distribution and preferences for redistribution: Evidence from a survey experiment. Journal of Public Economics, 98, 100-112.

[8] Downs, A. (1957). An economic theory of political action in a democracy. Journal of political economy, 65(2), 135-150.

[9] Dustmann, C., & Preston, I. (2001). Attitudes to ethnic minorities, ethnic context and location decisions. The Economic Journal, 111(470), 353-373.

[10] Fessler, P., Lindner, P. & Schürz, M. (2016). In focus: Eurosystem Household Finance and Consumption Survey 2014 – first results for Austria (second wave). Monetary Policy & the Economy, Oesterreichische Nationalbank (Austrian Central Bank), issue 2, pages 34-95.

[11] Forman, B., & Koch, C. (2012). Geographic Segregation: The Role of Income Inequality. Communities and Banking.

[12] Fry, R., & Taylor, P. (2012). The rise of residential segregation by income. Washington, DC: Pew Research Center, (202), 26.

[13] Golub, B., & Jackson, M. O. (2012). How Homophily Affects the Speed of Learning and Best-Response Dynamics. The Quarterly Journal of Economics, 127(3), 1287-1338.

[14] Karadja, M., Mollerstrom, J., & Seim, D. (2014). Richer (and Holier) than Thou? The Effect of Relative Income Improvements on Demand for Redistribution (No. 1050). George Mason University, Interdisciplinary Center for Economic Science.

[15] Levy, G., & Razin, R. (2017). The Coevolution of Segregation, Polarized Beliefs, and Discrimination: The Case of Private versus State Education. American Economic Journal: Microeconomics, 9(4), 141-70.

[16] Kiatpongsan, S., & Norton, M. I. (2014). How much (more) should CEOs make? A universal desire for more equal pay. Perspectives on Psychological Science, 9(6), 587-593.

[17] Meltzer, A. H., & Richard, S. F. (1981). A rational theory of the size of government. The Journal of Political Economy, 914-927.

[18] Norton, M. I., & Ariely, D. (2011). Building a better America—One wealth quintile at a time. Perspectives on Psychological Science, 6(1), 9-12.

[19] Norton, M. I., Neal, D. T., Govan, C. L., Ariely, D., & Holland, E. (2014). The Not-So-Common-Wealth of Australia: Evidence for a Cross-Cultural Desire for a More Equal Distribution of Wealth. Analyses of Social Issues and Public Policy, 14(1), 339-351.

[20] Reardon, S. F., & Bischoff, K. (2011). Income Inequality and Income Segregation. American Journal of Sociology, 116(4), 1092-1153.

[21] Savage, M. (2015). Social class in the 21st century. Penguin UK.

[22] Stiglitz, J. E. (2015). 8. Inequality and Economic Growth. The Political Quarterly, 86(S1), 134-155.

[23] Sunstein, C. R. (2018). # Republic: Divided democracy in the age of social media. Princeton University Press.

[24] Windsteiger, L. (2017), The Redistributive Consequences of Segregation. Working Paper of the Max Planck Institute for Tax Law and Public Finance No. 2017-12.

[25] Windsteiger, L. (2018). Monopolistic Supply of Sorting, Inequality and Welfare. mimeo