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Regional Deprivation, Individual Prospects, and Political Resentment

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Abstract

Regional economic conditions affect livelihoods and the geography of political resentment. Yet, individuals do not equally partake in their region's economic fortunes, and their perceptions of relative deprivation need not be the same. Grievances are likely to be shaped not only by income disparities but also by how personal prospects are tied to regional conditions. We argue that the interaction between subjective individual and regional relative deprivation crucially affects perceptions of shared experience and systemic unfairness. Through a large-scale survey experiment in Britain, we provide causal evidence that poor individuals in poor regions express more political resentment due to diminished personal financial prospects and social status. In contrast, political attitudes among poor and wealthy individuals are indistinguishable in affluent regions. Our findings reveal how reference groups affect subjective perceptions of relative deprivation and highlight the importance of egocentric mechanisms, whereby the local economy shapes expectations of individual prospects.

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Non-Technical Summary

Whether regional economic decline stems from import competition, automation, or the global financial crisis, there is substantial evidence that deteriorating local economies drive populist success. While cultural concerns also play a role in political discontent, a central explanation for its geographic clustering is that economic shocks undermine the livelihoods of those residing in affected areas. Importantly, the local economic context also shapes individual prospects: those in deprived areas face poorer employment trajectories and generally worse economic opportunities. In addition, individual economic outcomes are increasingly tied to regional fortunes, especially for those at the bottom of the income distribution. As a result, the interaction between individual and regional deprivation could act as a powerful driver of political resentment.

Do individual income positions shape political attitudes differently based on local economic conditions? Specifically, do lower-income individuals exhibit varying degrees of political resentment depending on whether they reside in wealthy or deprived regions, and why? These are important questions, but shedding light on how the relative income position of individuals and regions interact to shape political behaviour is challenging.

To address this, we employ a large survey experiment in Great Britain, where populism and spatial inequality have shaped the recent political discourse. We exogenously vary the salience of individual and regional deprivation, analysing both subjective and objective positions in the income hierarchy, as well as their interaction.

We confirm that subjective perceptions of both individual and regional deprivation increase political resentment. We also find that contextual deprivation significantly moderates the relationship between individual deprivation and political attitudes. Poorer individuals residing in disadvantaged regions articulate stronger anti-democratic sentiments, lower satisfaction with democracy, and reduced trust in government. By contrast, in affluent areas, poor individuals' political attitudes resemble those of wealthier residents, suggesting that regional prosperity mitigates resentment. In other words, individual relative deprivation does not necessarily foster resentment. Rather, it is when poor people live in poor regions that deprivation becomes politically charged and anti-systemic attitudes emerge.

The causal effects we uncover are substantial. For example, while only 30% of poor individuals in the most deprived regions express support for democracy, this figure rises to 70% in prosperous ones. Investigating mechanisms using mediation models, we show that prospective economic perceptions of personal finances and social status are key drivers. Poor individuals in less affluent regions are more likely to expect their personal economic situation to deteriorate in the coming year, a pessimism that subsequently fuels democratic dissatisfaction, distrust in government and populist attitudes. Additionally, the same individuals perceive themselves to be in a lower position in the social hierarchy, which further influences democratic dissatisfaction and distrust. In contrast, indirect effects are largely insignificant for poor individuals residing in wealthier regions, who appear to benefit from positive economic signals, higher social status, and the spill-over effects of thriving local economies.

This study makes three key contributions. First, we provide a new perspective on the reference categories and mechanisms that trigger feelings of relative deprivation: while inter-personal and inter-regional income comparisons both matter, individuals at the bottom of the income distribution articulate very different levels of political resentment depending on the prosperity of their region. This allows us to reconcile the apparent contradiction between two literatures – one focusing on regional economic drivers of political discontent, the other stressing that at the individual level cultural factors are instead better predictors of political behaviour. Although cultural factors are clearly important, we show that the effect of material drivers cannot be

fully disentangled without considering the interaction between individual and regional economic circumstances. The latter are in fact crucial to explain why individual deprivation does not always lead to higher political resentment.

Second, we highlight the importance of self-interest in shaping responses to geographic contexts. We show that individuals use regional economic conditions as heuristics for their personal prospects. Poor individuals in affluent regions perceive better future opportunities, reducing political resentment. Conversely, alignment between individual and regional deprivation exacerbates economic pessimism and dissatisfaction.

Finally, we provide causal experimental evidence in a field dominated by observational studies. Our design allows us to isolate the effects of regional deprivation from individual circumstances, offering insights into how subjective perceptions mediate these effects. We find that subjective economic perceptions outweigh objective conditions in driving political resentment. These perceptions, shaped by local contexts, strongly influence democratic dissatisfaction and distrust in government. Importantly, since subjective economic perceptions are known to correlate with partisanship, prior ideological leanings and personal circumstances, our experimental approach allows us to obtain causal estimates net of other potentially confounding factors.

Policy implications are clear: reducing political resentment requires addressing both individual and regional deprivation. Investments in economically disadvantaged regions can alleviate anti-systemic attitudes, but their success hinges on altering subjective beliefs among residents attuned to local conditions. This underscores the importance of place-based policies in mitigating political discontent.

Regional Deprivation, Individual Prospects, and Political Resentment

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Abstract

Regional economic conditions affect livelihoods and the geography of political resentment. Yet, individuals do not equally partake in their region's economic fortunes, and their perceptions of relative deprivation need not be the same. Grievances are likely to be shaped not only by income disparities but also by how personal prospects are tied to regional conditions. We argue that the interaction between subjective individual and regional relative deprivation crucially affects perceptions of shared experience and systemic unfairness. Through a large-scale survey experiment in Britain, we provide causal evidence that poor individuals in poor regions express more political resentment due to diminished personal financial prospects and social status. In contrast, political attitudes among poor and wealthy individuals are indistinguishable in affluent regions. Our findings reveal how reference groups affect subjective perceptions of relative deprivation and highlight the importance of egocentric mechanisms, whereby the local economy shapes expectations of individual prospects.

Keywords: Inequality; populism; democracy; regions; survey experiment.

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1 Introduction

Local economic performance is closely linked to political behavior (Carreras et al. 2019; Broz et al. 2021). Whether regional economic decline stems from import competition (e.g. Colantone and Stanig 2018; Choi et al. 2024), automation (Anelli et al. 2021; Baccini and Weymouth 2021), or the global financial crisis (Fetzer 2019; Cremaschi et al. 2022; Dal Bo' et al. 2023), there is substantial causal evidence that deteriorating local economies drive populist success.

While cultural concerns also play a role in political discontent (Margalit 2019a), a central explanation for its geographic clustering is that economic shocks undermine the livelihoods of those residing in affected areas. This aligns with research showing that personal economic hardship erodes institutional trust (Margalit 2019b) and downward income mobility pushes individuals toward populist parties (Burgoon et al. 2019; Dal Bo' et al. 2023). Importantly, the local economic context also shapes individual prospects: those in deprived areas face poorer employment trajectories (Moretti 2013) and more generally worse economic opportunities (Chetty and Hendren 2018). In addition, individual economic outcomes are increasingly tied to regional fortunes, especially for those at the bottom of the income distribution, for whom moving to more affluent regions have become harder (Frieden 2022; Langella and Manning 2022). As a result, the interaction between individual and regional deprivation could act as a powerful driver of political resentment.

Do individual income positions shape political attitudes differently based on local economic conditions? Specifically, do lower-income individuals exhibit varying degrees of political resentment depending on whether they reside in wealthy or deprived regions, and why? These are important questions, since the relationship between geographic economic conditions and individual responses to them is "...the research frontier in this important area of political economy" (Frieden 2022). Yet, shedding light on how the relative income position of individuals and regions interact to shape political behavior is challenging.

First, residential sorting —- driven by local economic or cultural factors —- makes it dif-

ficult to causally identify the impact of the regional context (Gallego et al. 2016; Maxwell 2019). Second, theoretical ambiguity surrounds the relevant reference categories. If individuals compare opportunities within their immediate surroundings, why would they evaluate distant regions? We argue that both localized and broader comparisons matter, with their interplay shaping perceptions of systemic unfairness. Finally, while evidence suggests regional disparities influence political behavior, the mechanisms remain contested. On the one hand, deprived individuals in a comparatively affluent region may resent not benefiting from the prosperity that others in their proximity enjoy (individual relative deprivation). Alternatively, an equally plausible hypothesis is that individuals experiencing deprivation only develop political resentment if their region is also economically disadvantaged. Here, only the alignment between individual and regional deprivation fosters a sense of shared experience, one for which the political system may be blamed. Indeed, poor individuals might temper their political resentment if living in well-performing regions provides better economic opportunities.

To address these issues, we employ a well-powered experimental design in Great Britain, where populism and spatial inequality have shaped recent political discourse (Cutts et al. 2020; McKay et al. 2021). We exogenously vary the *salience* of individual and regional deprivation, analyzing both subjective (perceived) and objective positions in the income hierarchy, as well as their interaction. This design enables us to causally estimate the impact of relative economic standing on political resentment, conceptualized as dissatisfaction with democracy, distrust in government, and populist attitudes.

Consistent with previous research, our results confirm that subjective perceptions of both individual and regional deprivation increase political resentment. More importantly, they also reveal that contextual deprivation significantly moderates the relationship between individual deprivation and political attitudes. Poorer individuals residing in disadvantaged regions articulate stronger anti-democratic sentiments, lower satisfaction with democracy, and reduced trust in government. By contrast, in affluent areas, poor individuals' political attitudes resemble those of wealthier residents, suggesting regional prosperity mitigates

resentment. In other words, individual relative deprivation does not necessarily foster resentment. Rather, it is when poor people live in poor regions that deprivation becomes politically charged and anti-systemic attitudes emerge.

The causal effects we uncover are substantial. For example, while only 30% of poor individuals in the most deprived regions express support for democracy, this figure rises to 70% in prosperous ones. Investigating mechanisms using mediation models, we show that *prospective* economic perceptions of personal finances and social status are key drivers. Poor individuals in less affluent regions are more likely to expect their personal economic situation to deteriorate in the coming year, a pessimism that subsequently fuels democratic dissatisfaction, distrust in government and populist attitudes. Additionally, the same individuals perceive themselves to be on a lower position in the social hierarchy, which further influences democratic dissatisfaction and distrust. In contrast, indirect effects are largely insignificant for poor individuals residing in wealthier regions, who appear to benefit from positive economic signals, higher social status, and the spill-over effects of thriving local economies.

This study makes three key contributions. First, we provide a new perspective on the reference categories and mechanisms that trigger feelings of relative deprivation. We argue that while inter-personal and inter-regional income comparisons both matter, individuals at the bottom of the income distribution articulate very different levels of political resentment depending on the prosperity of their region. This allows us to reconcile the apparent contradiction between two literatures – one focusing on regional economic drivers of political discontent, the other stressing that at the individual level cultural factors are instead better predictors of political behavior.[1] Although cultural factors are clearly important, our work shows that the effect of material drivers cannot be fully disentangled without considering the interaction between individual and regional economic circumstances. The latter are in fact crucial to explain why individual deprivation does not always lead to higher political resentment.

[1] See next section for more details.

Second, we highlight the importance of self-interest in shaping responses to geographic contexts. While prior work emphasizes socio-tropic considerations (Colantone and Stanig 2018), we show that individuals use regional economic conditions as heuristics for their personal prospects. Poor individuals in affluent regions perceive better future opportunities, reducing political resentment. Conversely, alignment between individual and regional deprivation exacerbates economic pessimism and dissatisfaction.

Finally, we provide causal experimental evidence in a field dominated by observational studies. Our design allows us to isolate the effects of regional deprivation from individual circumstances, offering robust insights into how subjective perceptions mediate these effects. Consistent with Green et al. (2024), we find that subjective economic perceptions outweigh objective conditions in driving political resentment. These perceptions, shaped by local contexts, strongly influence democratic dissatisfaction and distrust in government. Importantly, since subjective economic perceptions are known to correlate with partisanship, prior ideological leanings and personal circumstances, our experimental approach allows us to obtain causal estimates net of confounders.

Policy implications are clear: reducing political resentment requires addressing both individual and regional deprivation. Investments in economically disadvantaged regions can alleviate anti-systemic attitudes, but their success hinges on altering subjective beliefs among residents attuned to local conditions. This underscores the importance of place-based policies in mitigating political discontent (Austin et al. 2018).

2 Theoretical Framework

2.1 Regional and individual economic standing

Geography has emerged as a crucial factor in studies on populism (Golder 2016). Political attitudes across sub-national regions have become increasingly polarized, and contemporary theories focusing on material drivers of political resentment point to new divides between geographically concentrated economic "winners" and "losers" (Broz et al. 2021)

(Rodríguez-Pose 2018). Trade (Autor et al. 2020; Colantone and Stanig 2018), automation (Anelli et al. 2021; Baccini and Weymouth 2021) and the decline in manufacturing employment (Ejrnæs and Jensen 2024) and house prices (Adler and Ansell 2020), austerity measures (Fetzer 2019; Cremaschi et al. 2022; Dal Bo' et al. 2023) and immigration (Mayda et al. 2022; Arzheimer et al. 2024) have all been highlighted as drivers of the contemporary geographies of discontent. More generally, a growing body of evidence suggests that inter-regional inequalities significantly contribute to various forms of political resentment (McKay 2019; Dijkstra et al. 2020; McKay et al. 2021).

This literature indicates that inter-regional comparisons should play a role in how governments are held responsible for regional economic performances. The same argument may apply to an individual's own fortunes. Although the empirical evidence is less clear cut, several studies have shown that economic shocks, economic insecurity, and low position in the income hierarchy are associated with lower individual trust in government and support for populist parties (Margalit 2019b; Guiso et al. 2024; Burgoon et al. 2019).

Thus, drawing on extant literature on material drivers of discontent, our baseline hypothesis posits that *political resentment will be higher the poorer a person or region is (H1)*.

2.2 Relative income deprivation: Regional vs individual

The role of economic disparities *between* regions in explaining political turmoil seems indisputable. At the individual level, the evidence is less consistent, since another strand of the literature has emphasized instead the dominance of cultural – as opposed to material – determinants (Norris and Inglehart 2019; Mutz 2021; Margalit et al. 2024) – including a sense of anxiety over issues such as collective identity (Ziblatt et al. 2024), social status (Gidron and Hall 2020), conservative values (Carreras et al. 2019; Ballard-Rosa et al. 2021) and a growing urban–rural divide (Maxwell 2019).

While cultural factors play an important role, we argue that to capture the effects of material drivers at the individual level, we must consider how inter-personal and inter-regional

material comparisons interact, as different reference categories might play a crucial role. Theories emphasizing the role of economic grievances often draw on the concept of *relative deprivation*. As conceptualized by Walker and Pettigrew (1984), this concept refers to the idea that individuals 'may feel deprived of some desirable thing relative to their own past, another person, persons, group, ideal, or some other social category'.

As summarized by Burgoon et al. (2023), reference categories in studies of relative positioning vary along two dimensions: static vs. longitudinal, and between vs. within groups. We argue that *individual* positions, and their interaction with *regional* ones, represent an important yet under-theorized aspect of how geographical contexts shape political attitudes. Our approach builds upon the premise that the most proximal community serves as a key heuristic for understanding social and political reality (Vasilopoulou and Talving 2023). Proximal spatial contexts, through community experiences and social interactions, offer clearer signals about one's relative standing compared to highly comparable reference groups, whether one's situation is individualized or shared, and about potential future prospects. The interplay between inter-regional and inter-personal income comparisons can thus illuminate which reference categories are most likely to trigger resentment, which geographical contexts provide the clearest comparison signals, and, consequently, which levels are most effective for targeting with compensation or investment strategies to counter political resentment.

The interaction between individual and regional relative deprivation gives rise to two competing hypotheses. The first is that *political resentment will be higher among poorer individuals in poor rather than in rich regions (H2)*. Three key arguments support it.

First, experiences of deprivation are more likely to become a social and political issue if they are shared by other members of the community. In contrast, if deprivation is perceived as an individual circumstance within a relatively well-performing context, people experiencing it may be less inclined to attribute responsibility to the political system.

Second, individuals may not perceive others within the same region as an out-group, even if those individuals have better economic prospects. Drawing on Runciman (1966)'s classic

discussion, perceptions of relative deprivation arise when one compares their situation to a reference group *to which they do not belong*. This could also clarify why the relationship between economic inequality and satisfaction with democracy has often been found to be null when focusing on highly proximal local contexts (Colombo et al. 2024).

Third, if people are more likely to frame deprivation as a political issue only when it is shared by those with whom they identify, and if they do not view other residents in their region as an out-group, it follows that comparisons with wealthier individuals in a prosperous context should not trigger a backlash. In fact, poor individuals in affluent regions might benefit from positive spill-overs and the signal that people like them can succeed.

A rival hypothesis posits instead that *political resentment will be higher among poorer individuals in rich regions (H3)*. This notion is supported by three theoretical arguments. First, in contrast to H2, this expectation validates relative deprivation theory at the most proximal geographic level. It suggests that individuals in poorer circumstances do not perceive the wealthy in their region as members of the same group, but as a reference category that enjoys the benefits of a context that should also benefit them.

Second, individuals with lower incomes may face negative externalities from living in a comparatively wealthier region, such as high costs of living or inaccessible housing markets (Katsanidou and Mayne 2024). Third, there could be a decline in social cohesion (Gidron and Hall 2020) when deprivation occurs in a region that is generally doing well. While life experiences across distant regions may not affect social connectedness, perceptions of individual deprivation can have a more direct impact on social networks. When lower-income individuals are exposed to significantly different and more privileged lifestyles, social ties may weaken, interpersonal trust could decrease, and political support and satisfaction are likely to decline.

2.3 Mechanisms

The previous section has outlined two rival hypotheses on how an individual's position within a region can shape political resentment, depending on whether that region is performing better or worse compared to others. We now propose two complementary mechanisms that help explain why this might be the case: economic mechanisms, including the effects of regional prosperity on individuals' financial expectations, and non-economic mechanisms, such as interpersonal trust and social status.

Regarding the first, most studies focusing on regional economic shocks conclude that the effects are socio-tropic, i.e. individuals react to the conditions of their region, regardless of their specific circumstances (Colantone and Stanig 2018; Duch and Stevenson 2008). While self-interest has proven to be elusive in past literature, it can become a more prominent driver of political attitudes when the attribution of responsibility to the government is clearer. Tilley et al. (2018) show that people respond much more strongly to changes in their finances that are directly linked to government policies (e.g., cuts in welfare benefits), rather than to changes less clearly attributable to elected officials (e.g., losing one's job). This suggests that the clarity with which individuals can link their economic situation to the actions of the government plays a critical role in shaping political attitudes.

Building on this, we argue that a shared experience of deprivation within one's region can serve as a heuristic that activates both socio-tropic and self-interested (ego-tropic) mechanisms. More specifically, comparing one's own situation to that of others in a proximal context (the region) can influence how individuals attribute political responsibility (socio-tropic) and how they perceive their own economic prospects (ego-tropic). If H2 holds, and poorer individuals are more likely to feel political resentment in poorer regions, their shared experience of deprivation becomes salient. In such environments, the political system may be seen as directly responsible for the situation, fueling resentment. However, this also aligns with the notion that local material deprivation can lead to economic competition in the labor market, which could directly affect personal wages and job prospects (Bolet 2020). As a result, such conditions are likely to increase political resentment as individu-

als may view their personal situation as a direct consequence of local economic conditions, thereby strengthening both socio-tropic and ego-tropic mechanisms. Likewise, poor individuals in richer contexts can personally benefit from positive economic spillovers, better social services, and more optimistic ego-tropic financial prospects. Considering regions as benchmarks of future economic prospects ties also into recent evidence suggesting that prospective (rather than current or retrospective) economic evaluations are key determinants of vote choice (Häusermann et al. 2023).

Economic mechanisms can also be at play if H3 holds – if poor individuals are those more likely to activate resentment in comparatively richer places. Validating economic mechanisms behind H3 would imply that perceptions of current deprivation, rather than future prospects, are more likely to affect political resentment.

Non-economic causal mechanisms in our setting focus on trust and social status and can operate alongside or instead of economic channels. The vast literature on social capital argues that spaces of social interaction foster reciprocity and connections between people, and that this, in turn, generates interpersonal trust (Putnam 1994, 2000). In this tradition, interpersonal trust is considered a key driver of political support and democratic satisfaction (Norris 1999; Newton 2001; Uslaner 2002; Almond and Verba 2015). Bolet (2021) adds a useful geographical perspective to the debate when articulating local socio-cultural degradation theory. Socio-demographic shocks have affected local community structures (Jennings and Stoker 2018), and in particular social-cultural hubs where people interact and build trust.

Trust can be a mechanism behind both our hypotheses of interest. In a context of general economic decline, poorer individuals in poor regions can become more isolated and distrustful, and therefore more politically resentful, due to declining spaces for social and cultural interaction (H2). Alternatively, more homogeneous spaces, even if deprived, could be more likely to articulate cohesive social networks of solidarity. From this perspective, it could be the poor in rich regions the ones driving resentment (H3). The lack of interaction with richer residents in unaffordable social-cultural hubs, neighborhoods, or lifestyles could lead to less trust and more political backlash.

Finally, the politics of status could be a mechanism behind how individual and regional relative deprivation interact. Gidron and Hall (2020) convincingly argue that economic and cultural transformations have led to different levels of *subjective social status* – citizens' beliefs about where they stand relative to others in society. The concept of subjective social status is conceptually and empirically distinct from social class and objective social status, and critical to explain radical right voting (Gidron and Hall 2020; Carella and Ford 2020; Kurer 2020). While economic disparities can lead to different perceptions of social status, the latter is a distinct phenomenon that goes beyond strict material calculations. Social status may explain why white working classes feel that 'they have been demoted from the center of their country's consciousness' (Gest 2016: p.15).

Social status can be a key mechanism behind our hypotheses on how geographic inequalities interact. Regional circumstances can be cognitive heuristics informing the importance, centrality, and prestige of one's position in society, beyond strictly individual circumstances. If H2 is valid and resentment is driven by the poor in poor regions, this would mean that comparatively well-performing regions attenuate political backlash among the poor by giving them a sense of belonging to a 'place that matters'.

This would also mean that it is only when individual and regional deprivation align that perceptions of status decline and political backlash is more likely. By contrast, if lower perceptions of social status are behind H3, this would mean that interpersonal comparisons carry a heavier weight in driving political resentment and falling behind in a generally well-performing region is what reduces one's own perceived position in the social hierarchy.

2.4 Objective vs. subjective inequality

While objective macro-economic conditions feature prominently in economic voting studies, in a recent contribution, Green et al. (2024) convincingly argue that evaluating local economic conditions is inherently difficult, and that perceptions need to be studied as a distinct driver of political attitudes and behavior. In particular, individual perceptions might diverge

from reality because of biases induced by political preferences, personal economic conditions (Evans and Pickup 2010) or limited information (Gimpelson and Treisman 2018). The mismatch between reality and perceptions can be behind the null effects of local economic inequality on political system support found in some countries (Colombo et al. 2024).

An alternative view is that individuals use objective information to form subjective evaluations that play a key role in their political behavior (Ansolabehere et al. 2012). From this perspective, the effect of subjective perceptions is not due to a mismatch with objective realities, since individual perceptions should be correlated with objective information. At the same time, subjective beliefs are analytically and empirically distinct from objective measures because "...they embody subjective feelings about where one stands relative to others in society" (Gidron and Hall 2020). In addition, active information acquisition (i.e. thinking of one's position on a hierarchy scale) has proved to be more effective than passive information provision on attitude formation (Vössing and Weber 2019). Therefore, even if an individual's perceptions coincide with actual measures, they could still have different effects.

In our study, we build on this debate by *i)* disentangling objective and subjective relative economic positioning; *ii)* analyzing whether potential differences are due to a considerable mismatch between reality and perception, or rather to a distinct cognitive mechanism through which perceptions operate; *iii)* providing a genuine exogenous test of the effects of perceptions, net of other confounders like partisanship and personal circumstances.

3 Research design

3.1 Experimental setting

To disentangle the effect of regional and individual deprivation, we conducted a survey experiment involving 8,000 individuals aged 18 and above based across 358 local authorities in England, Scotland, and Wales. This setting is ideal for disentangling the effects of individual and regional deprivation and their interaction since significant income variation has

been documented both across and within local authorities in Great Britain (McCann 2020; Disney et al. 2023). Our experiment is well-powered according to conventional criteria. It would allow us to detect significant differences (at a 95% confidence level) between our control and treatment groups as small as 0.17 points (i.e. 3-4% difference on a 1-5 Likert scale).[2]

After obtaining ethical approval[3] and pre-registering our study,[4] the survey was fielded online between April 1-29 2022 by the polling firm Deltapoll.[5] Participants were incentivized to utilize virtual tokens that could be ultimately exchanged for money or vouchers. Table A.6 in the Appendix reports descriptive statistics of the demographic profile of our respondents, which is broadly in line with those of the underlying population according to data from the British Election Study.[6]

After giving consent and before being exposed to our experimental arms, respondents were asked to provide detailed information on their gross household income and composition[7] as well as their postcode. The postcode was then matched to the respondent's Local

[2] See Appendix C for detailed power calculations.

[3] Application number XXX reviewed by the Ethics Board at the University of XXX [anonymized for peer review]. More details on the ethical implication of this study are available in Appendix B.

[4] The registration is available at `https://osf.io/v3zg9/?view_only=398eb2aa1deb4a92b29005bf7c0fad85`

[5] The initial data collection did not include a cross-over treatment on subjective household and regional deprivation, but only the objective measures. We, therefore, conducted a second round of data collection in August 2023 with 2,000 additional respondents (1,001 in the treatment and 999 in the control group) to add this treatment. The study design, questionnaire, and participant recruitment were strictly the same.

[6] Our sample is very similar to the underlying population in terms of age, gender, ethnicity, and home ownership. Individuals interested in politics are slightly oversampled, and our respondents are significantly more educated than the underlying population. Unconditional and conditional treatment effects in survey experiments have proved to have a high correspondence across representative and non-representative samples (Coppock et al. 2018).

[7] Respondents were informed that gross household income is the "income before tax from all sources such as earnings, benefits, pensions, and any other sources for yourself, your partner and anyone else who lives with you" and given the option to report it on a weekly, monthly or yearly frequency. If respondents chose not to provide the exact amount, they were given the option to choose an income range out of ten possible alternatives. Respondents were further asked how many adults and children live in their households. This information was then used to standardize household income to account for the size and composition of the household. In particular, we use the OECD-modified method used by the Office of National Statistics. For more details on weights used for the normalization see

Authority (LA), i.e. the most important administrative subdivision in England, Scotland, and Wales (Brien 2023), for which a wealth of data is systematically available (Fetzer 2019).[8] LAs are meso-level units of aggregation tapping well into areas of residence, capturing salient local contexts that are easily identified by respondents (i.e. Hartlepool, Blackpool, or Stoke-on-Trent in England; East Lothian or Aberdeenshire in Scotland; Cardiff or Newport in Wales), compared to other, more artificial administrative units. Moreover, LAs are more granular than regions (e.g. East Midlands, South West, etc.) or nations (e.g. Wales, Scotland), which could be confounded by center-periphery or national identity conflicts.

As our main goal is to assess the effect of individual and regional deprivation on political resentment, we have gathered systematic information on household incomes from the Family Resource Survey (2019)[9] and on Local Authority real GDP per capita (2019) from the ONS,[10] which we use to build household and regional scales reporting the percentiles of the (standardized) household (respectively, region) income (respectively, GDP) distribution. Figure 1 displays the GDP per capita percentile ranking position for each LA included in our study. As expected the richest local authorities are clustered around London and the South of England. The map further confirms a strong urban-rural divide, with cities generally ranking higher in terms of economic outputs. We also built an alternative distribution using GDP per capita growth over the previous 10 years that we used in one of the information treatments as an additional measure of LA's relative economic performance.[11]

Using the information on standardized household income and LA per capita GDP, respondents were classified as being above or below the median in terms of standardized household income, and as living in a poor, medium, or rich LA in terms of per capita GDP. We then used

`https://www.oecd.org/els/soc/OECD-Note-EquivalenceScales.pdf`.

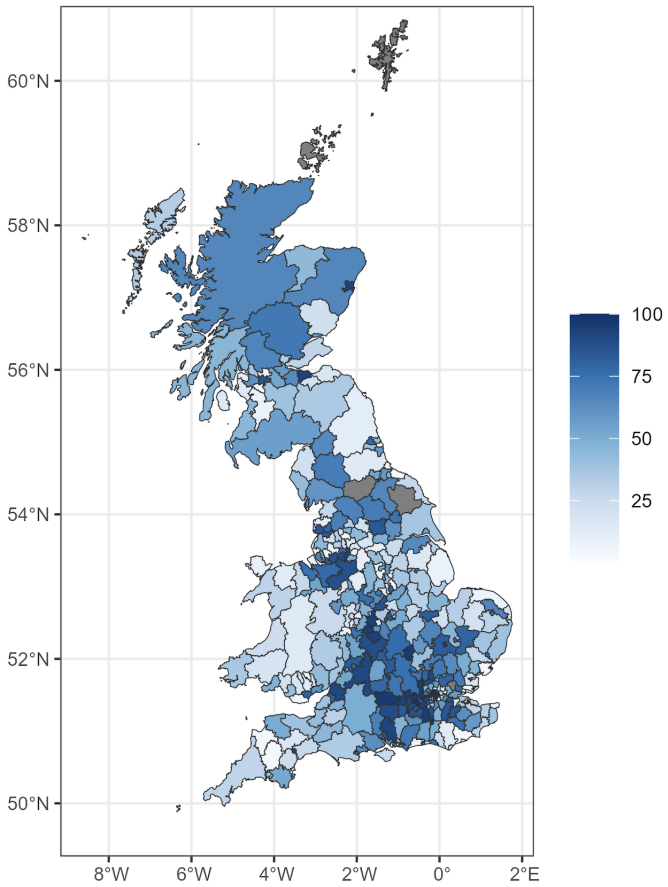
[8] According to the Office for National Statistics in the UK (`https://tinyurl.com/52jkbe4p`), there is an average of 70,261 households in English LAs, 77,278 in Scotland, and 61,250 in Wales.

[9] Source: Department for Work and Pensions, Office for National Statistics, NatCen Social Research, 2021, Family Resources Survey, 2019-2020, [data collection], UK Data Service, DOI: `http://doi.org/10.5255/UKDA-SN-8802-1`.

[10] Source: Regional gross domestic product (GDP) local authority reference tables, provided by Regional Accounts, Office for National Statistics.

[11] Results of this alternative treatment are reported in Figure A.15 in the Appendix.

Figure 1: Local GDP per Capita (in percentile ranking)



Data: ONS.

block randomization to ensure that each of our experimental arms had a balanced number of respondents belonging to each of those household and regional income groups. Figure A.7 in the Appendix reports respondents' distribution of income and regional percentiles and confirms that we have sufficient observations across the range. Figure A.8 further confirms that we have a similar number of poor and rich respondents across all regional GDP percentiles, e.g. sufficient numbers of poor households in rich regions or vice versa.

Our experiment consists of seven randomly assigned prompts whereby participants are exposed to information on household income and LA GDP per capita distributions, in addition to a control group that does not receive any information. The goal of our exercise is to establish whether priming respondents on their (or their LA) objective or perceived position in the income hierarchy affects political resentment – in comparison with the control group – by making relative deprivation salient.

Respondents are informed that the sliders used in the vignettes rank households and LAs from the poorest to the richest on a percentile scale (see Appendix A for full wordings and vignette layouts) and are then exposed to different information on the distribution depending on the treatment. The goal of this intervention is to elicit whether individual/regional relative deprivation, captured by their actual or perceived position in the income/GDP ranking, affects political resentment. The experimental treatments are summarized below:

- **CONTROL GROUP:** This group did not receive any information or prompt about household and LA GDP per capita distributions and was directly exposed to our outcome questions.
- **OBJECTIVE INCOME DEPRIVATION:** This group received information on the average UK household income position and the respondent's true position on the equalized household income distribution.
- **SUBJECTIVE INCOME DEPRIVATION:** This group received information on the average UK household income position on the equalized household income distribution. However, instead of being told their true position, respondents were asked to indicate where they thought they stood in the income distribution using an interactive slider.
- **OBJECTIVE REGIONAL DEPRIVATION:** This group received information on the average local GDP per capita and the respondent's LA position in the LA GDP per capita distribution.
- **OBJECTIVE REGIONAL GROWTH:** This group received information on average LA per capita GDP growth and the true position of the respondent's LA in the per capita GDP growth distribution.
- **SUBJECTIVE REGIONAL DEPRIVATION:** This group received information on the average LA GDP per capita in the LA GDP per capita distribution. However, instead of being told their LA's true position, respondents were asked to indicate where they thought their LA stood in the distribution using an interactive slider.

- **INCOME and REGIONAL DEPRIVATION:** Given our hypotheses on the congruence between individual and regional economic deprivations (H2 and H3), these treatments combine the previous ones. In the objective treatment, respondents received information both on their true position in the household and regional hierarchies, whereas in the subjective one, they were asked to position themselves both on the household and regional distributions.

As we show in Appendix F, we have achieved balance between the treatment and control groups on a large set of pre-treatment demographic and political covariates.

To assess whether respondents understood both the concept of income distribution articulated in the vignettes and their own position, all treatments contained a manipulation check. More specifically, we asked 'given this information' (or 'given your guess', in the case of subjective treatments), 'what percentage of households (local authorities) would earn more than you (perform better than yours)?'. We calculated a measure of error by subtracting the correct value from that provided by the respondent. Figure A.25 in the Appendix shows the distribution of the error generated by our treatments. This exercise indicates a very remarkable level of understanding of the setup of the experiment, with the value 0 (e.g. no error) being the overwhelming modal category across all treatments.

We also added a manipulation check to determine whether our treatments induced concerns over deprivation and related inequality.[12] Figure A.11 in the Appendix shows that only the treatments highlighting the relative position of regions significantly affected concerns over inequality. In particular, individuals living in better off (worse off) LAs, defined either with objective per capita GDP information or subjective perceptions, have significantly lower (higher) concerns over inequality. By contrast, treatments highlighting household income do not impact individual views on the matter. This preliminary evidence indicates that relative geographical standings are more likely to activate political concerns over inequality than personal economic circumstances.

[12] More specifically, respondents were asked 'How concerned are you, if at all, about inequality in the UK?' (measured on a 4-point scale from 'not concerned at all' to 'very concerned').

3.2 Outcome variables

After being exposed to a treatment, respondents were asked several questions, tapping into political resentment.[13] Our four outcomes measure attitudes broadly related to citizens' support for the political system, studied in recent scholarship, including preferences for and satisfaction with democracy (Claassen 2020), distrust in government (McKay et al. 2021), and support for populism (Akkerman et al. 2014).[14] More specifically, the wording of our questions is as follows (see Appendix D for descriptive statistics, including heat maps at the LA level.):[15]

- **Preferences for democracy as a system:** 'Which of the following statements comes closest to your own view?' (recoded into a dummy where 1='Democracy is preferable to any other kind of government' and 0='Under some circumstances, an authoritarian government can be preferable to a democratic one' or ' For people like me, it doesn't matter whether we have a democratic or non-democratic regime'.
- **Satisfaction with democracy:** 'Taking everything into account, how satisfied or dissatisfied are you with the way that democracy works in the UK as a whole?' (1-4 scale from 'very dissatisfied' to 'very satisfied').
- **Distrust in government:** 'How much of the time do you think you can trust the government in Westminster to do what is right?' (1-4 scale from 'Just about always' to 'Hardly ever').
- **Populism:** based on (Akkerman et al. 2014), we construct an additive index from the

[13] The order of the outcome variables was randomized across respondents to avoid some variables being temporarily asked closer to the treatment and therefore potentially showing stronger effects.

[14] In Appendix H.6 we report the main results on an additional, pre-registered outcome, measuring anti-immigrant attitudes. As exploratory factor analyses revealed this outcome loads on a separate factor than the other four. Results show that making a respondent's subjective, personal income salient reduces anti-immigrant attitudes. The other treatments do not impact this outcome.

[15] Table A.2 reports the pairwise correlation between our dependent variables. Apart from distrust in the government and satisfaction with democracy (R=0.53) as well as distrust and populism (R=0.31), the four outcome variables are not highly correlated. However, an explorative factor analysis reveals that the four indicators load on one distinct dimension (see Table A.3 in the Appendix.

following battery of items (the order of items was randomized, and all items were coded on a 1-5 scale from 'strongly disagree' to 'strongly agree'): 'The politicians in the UK parliament need to follow the will of the people'; 'Elected officials talk too much and take too little action'; 'I would rather be represented by a citizen than by a specialized politician.'; and 'The people, and not politicians, should make the most important policy decisions'.

To allow a comparison of the impact of each of the treatments on four outcomes, we standardized the outcomes to have an average of zero and a standard deviation of one.

3.3 Models

The goal of our experiment is to causally estimate the effect of household and regional deprivation on political resentment by comparing whether subjects exposed to an information treatment display different responses compared to those in the control group. To this end, we estimate the following baseline model separately for each treatment:

$$Y_i = \alpha + \beta_1 T_j + \beta_2 I_j + \gamma T_j \times I_j \tag{1}$$

Y_i is the predicted individual level outcome of interest (e.g. our measures of political resentment); T_j, with $j \in \{i, r\}$, is an indicator variable equal to one if the subject has been exposed to an individual (i) or regional (r) treatment and zero if she is instead in the control group; I_j measures individuals' household income (I_i) and local authority GDP per capita (I_r). The coefficient of interest is γ and captures the effect of the treatment, comparing treated and non-treated individuals with the same household income (individual treatment) or the same local authority GDP per capita (regional treatment). In other words, our main parameter of interest is the coefficient of the interaction between income percentile and an indicator variable which is equal to 1 for respondents in the relevant treatment group and zero otherwise.

To estimate instead the effect of the cross-over treatments – where we combine individual

and regional information – we augment the previous specification to allow for the full set of relevant interactions.[16]

4 Results

We present our findings in three steps. First, we focus on the direct effects of personal and regional deprivation, and whether their impact on political resentment is stronger when triggered objectively or subjectively. Second, we investigate the interaction between personal and regional deprivation. Third, we explore possible causal mechanisms behind our findings.

4.1 Main effects of income and regional deprivation

In Figure 2, we report the effect of our treatments on our main outcome of interest, i.e. political resentment. As previously noted, subjective perceptions and objective information on the relative position of one's household or local authority, while correlated, are conceptually distinct since subjective perceptions embody individual feelings that can trigger a different response.

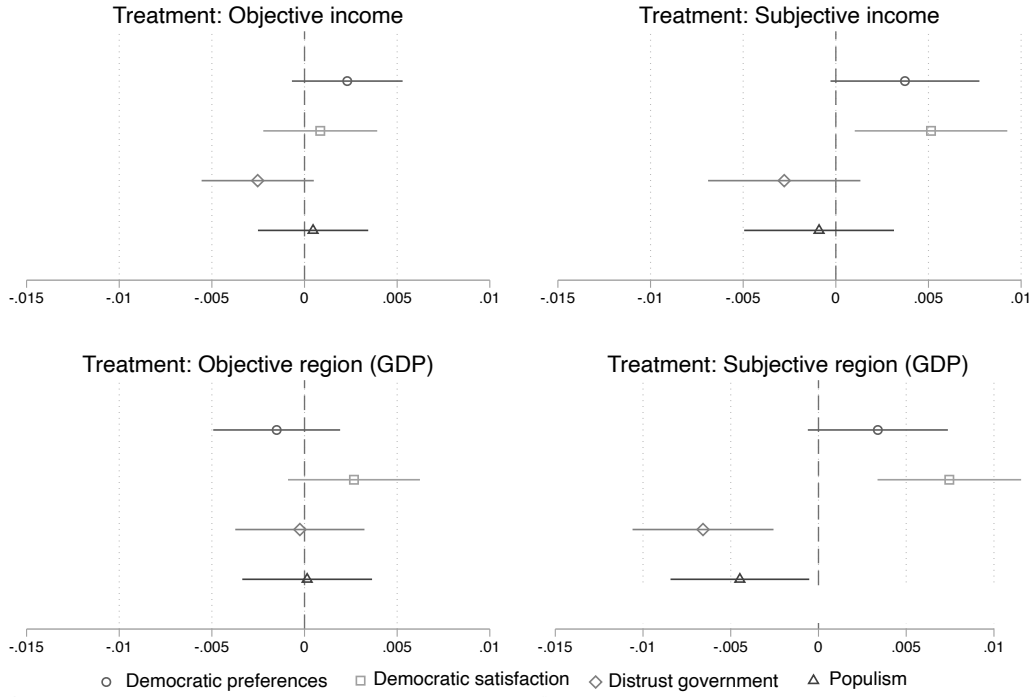
Starting with the subjective treatments – in which respondents were asked to indicate where they believe to stand in the income or regional GDP distribution – our estimates indicate that subjective beliefs of regional positional deprivation have a significant effect – which is in the expected direction – on democratic satisfaction, trust in government, and populist attitudes. The same holds for preferences for democracy as a political system, even if the effect is significant only at the 10% level. In terms of magnitudes, all significant

[16] In particular, we estimate the following model:

$$Y_i = \alpha + \beta_1 T_{ir} + \beta_2 I_i + \beta_3 I_r + \beta_4 T_{ir} \times I_i + \beta_5 T_{ir} \times I_r + \beta_6 I_i \times I_r + \gamma T_{ir} \times I_i \times I_r \quad (2)$$

where T_{ir} is an indicator equal to one if the subject has been exposed to the treatment combining individual and regional information and zero otherwise. In this case, the main coefficient of interest (γ) captures the heterogeneous effect of the treatment depending on the congruence between individual and regional income.

Figure 2: Results: Main effects of treatments on political resentment



Note: Standardized coefficients and 95% c.i. of interaction between treatment and income/region GDP on political resentment outcomes. The full results are available in Appendix H.1. Appendix H.3 further plots the marginal effects of the treatments by income/GDP percentiles.

effects have a standardized coefficient of between 4-7% of a standard deviation of the outcome. This means that, for instance, switching from the 20th to the 40th percentile in the regional wealth distribution decreases government distrust by 14% of its standard deviation. When looking at subjective household income results are broadly in line with the subjective regional treatment, although the effects on trust and populism fail to reach statistical significance, and the effect on democratic satisfaction is marginally smaller.

The main conclusion from the analysis of the subjective treatments is that perceptions of both household and regional deprivation matter for the politics of resentment, supporting H1. Our experimental design allows us to rule out confounders such as individual circumstances, potential self-selection, and compositional effects, showing that regional deprivation affects several outcomes connected with the political system – democratic satisfaction, distrust in government, and preferences for populist vs. liberal forms of politics – above and beyond individual-level drivers.

It is important to note that the effects of perceptions documented here are causal since our subjective vignettes only make deprivation salient, and given our randomization, we expect a similar distribution of latent subjective assessments in the control group. It is also worth noting that as we are only varying salience without providing new information to correct pre-existing beliefs, our findings imply that political resentment is likely to increase whenever regional disparities are highlighted in the public debate.

Turning to the objective treatments displayed in Figure 2 – where respondents are provided information on their own or their region position in the income distribution – we do not find statistically significant average effects.[17] Appendix H.3 unpacks the marginal effects of our objective treatments along the whole range of household income and regional GDP per capita. While the slopes are indeed statistically insignificant (as reported in the multiplicative terms in Figure 2), there are statistically significant effects of the objective household income treatment for poor respondents on democratic preferences and political trust. As shown below, this is consistent with the idea that the poor are driving our main substantive effects, even if the objective version of our treatments fails to reach overall statistical significance.

The majority of our results are robust to i) restricting our sample to those respondents who understand the treatment very well (the error is less than 5 percentile points compared to the true value); ii) the inclusion of demographic controls to further account for small but borderline significant imbalances in terms of gender and ethnicity, iii) including region dummies (e.g. East Midlands) to account for other unobserved regional effects like constitutional or center-periphery disputes, and iv) using a third order polynomial specification to account for non-linearities. The additional results are included in Tables A.7 to A.10 and section H.4 in the Appendix.

[17] In addition, in Appendix Table A.11 we show that the impact of the subjective, regional treatment is significantly larger, compared to the objective treatment, for all four outcomes.

Subjective vs objective deprivation Overall our analysis provides *prima facie* evidence consistent with the literature stressing the importance of subjective perceptions as opposed to objective information in shaping political behavior and attitudes. Below, we explore potential factors behind the effects we have uncovered.

Why do subjective perceptions of deprivation offer clearer statistically significant effects when compared to objective information? Our research design allows us to assess the role of four potential explanations. First, respondents might misperceive their economic standing or that of their region, meaning that subjective beliefs and objective measures of relative deprivation could be uncorrelated. Second, the objective treatments might have been more difficult to understand due to the cognitive complexity of the information we provide. Third, even if subjective and objective treatments were well understood on average, respondents might have engaged better with the former. The interactive slider might have generated more attention to the experiment and as a consequence more meaningful answers. Finally, perhaps there were no survey design effects but subjective perceptions simply tap into stronger emotional reactions to inequality than objective information. In this case, our results would simply show that subjective measures have perfectly valid exogenous effects on the outcomes which are larger compared to objective measures. Our analysis provides support for the last argument: subjective beliefs are very well grounded in reality but involve feelings about relative standings in society that might trigger stronger emotional responses to inequality.

More specifically, since we have information on both the "true" and the perceived positions of respondents and their LAs in the income and GDP distributions respectively, we can gauge the extent to which subjective perceptions are related to objective markers. Using a bin scatter plot, Appendix I shows that the correlation between objective and subjective rankings of household and regional income is very high, implying that the difference in the response patterns across subjective and objective treatments is unlikely to be driven mainly by misperception. We further corroborate this argument by showing that our results are virtually unaffected when we restrict the analysis to those individual respondents who very

accurately predict their position (i.e. their error is less than 15 percentiles) in the household and regional income distribution (see Appendix Figure A.21).

Additionally, we study whether the lack of misperception we have observed on average might mask different patterns for specific subgroups of respondents. To this end, we assess whether some individual or regional characteristics systematically predict subjective placements but not objective ones. In Figure A.23 in the Appendix, we start by estimating the effect of individual characteristics on perceived and actual household income position (left panel) and regional per capita GDP (right panel). As we can see, in general, individual characteristics move perceived and actual household income positions in the same direction. Similar patterns hold when we consider regional per capita GDP, except for urban residency and house ownership. Living in an urban area or owning a home significantly increases the perception of how well the region is doing, although in reality urban households and homeowners are not more likely to live in local authorities that are objectively better off.

Turning to the macroeconomic context of the LAs, Figure A.24 shows the effect of economic performance indicators at the LA level on the perceived and actual LA position in the per capita GDP distribution. To this end, we focus on three indicators. The first captures the exposure of LAs to long-term decline measured as the share of individuals in 2000 who were employed in sectors that experienced a decline over the subsequent 20 years. The second is a measure of exposure to (positive) employment shocks built by first computing the national change in employment by sector between 2010-2019, and then attributing this change to local authorities using their share of employment by sector in 2010, standardized by the local authority total employment in that year.[18] Our third and last measure focuses on the housing market and captures the average price change at the LA level between 2000 and 2019.[19]

As we can see, these indicators have significant effects in the expected direction on both

[18] The source of the employment data is the Business Register and Employment Survey by the Office for National Statistics.

[19] The source of housing prices is "House price statistics for small areas in England and Wales" by the Office for National Statistics.

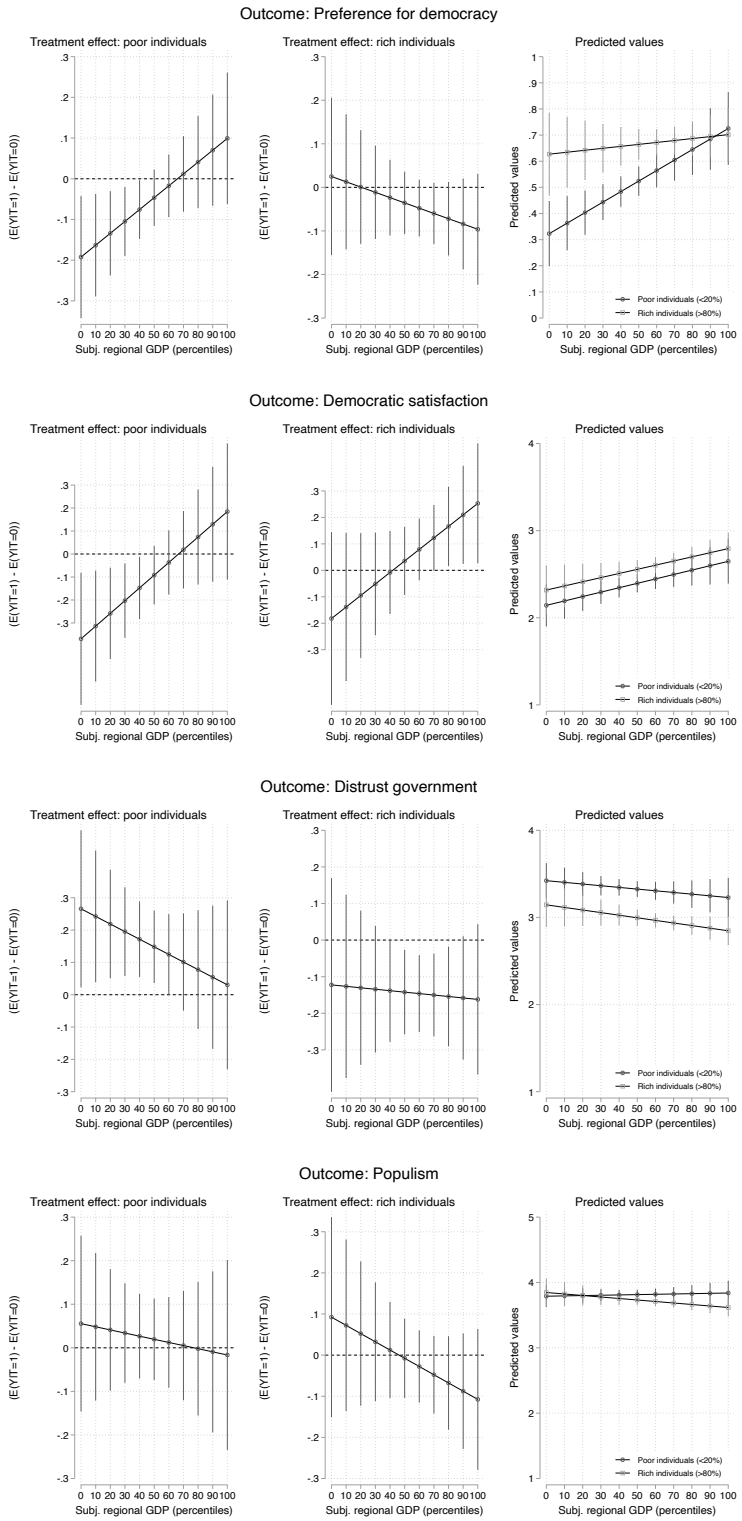
the perceived and the actual LA position in the per capita GDP distribution. In particular, LAs that are initially more specialized in declining sectors are poorer, and respondents from these regions perceive them to be so (left panel). Likewise, regions more exposed to positive employment shocks (middle panel) are richer and also perceived to be so. The same applies to regions experiencing positive housing price dynamics (right panel). This means that macroeconomic conditions - which are consistently and intuitively related to our measures of deprivation - do not point to a mismatch between objective and subjective measures. This is true even if objective effects are larger than perceived ones. To sum up, subjective perceptions appear to be, to a very large extent, grounded in reality.

We can also rule out the possibility that our objective informational treatments were too complex. As we discussed earlier, after each treatment we added a manipulation check asking respondents which percentage of households or regions were doing better than theirs given the information presented in the treatment. Appendix Figure A.25 shows the distribution of the error generated by our treatments, calculated as the difference between the correct answer and the answer given by the respondent. This analysis shows a very high level of understanding of the information in our vignettes. The value 0 (e.g. no error) is a clear modal category across all treatments, without noticeable differences between subjective and objective treatments. Finally, Figure A.26 shows the average time that respondents spent on each treatment, indicating very similar levels of engagement and attention across all experimental arms.

4.2 Interactions between individual and regional circumstances

Having established that perceptions of relative deprivation play a significant role in the formation of political grievances, we now turn to the interaction between individual and contextual circumstances to assess whether individuals with different positions in the income hierarchy display different attitudes depending on local economic conditions. By doing so we can shed light upon which reference categories are most likely to trigger resentment and which geographical contexts provide the clearest comparison signals.

Figure 3: Congruence scenarios predicting political resentment



Note: Marginal effects and predicted values with 95% c.i. of interaction between treatment, household income (poor = 20% percentile, rich = 80% percentile) and region GDP on political resentment. The full results are reported in Appendix J.

In Figure 3 we summarize the results obtained when respondents are simultaneously primed on subjective household and regional deprivation, plotting the marginal effect of the treatment across different values of the per capita GPD distribution for poor (bottom-20%) and rich (top-20%).[20] Our results overall show that, for several outcomes, the politics of place matters for poor households (panels on the left), but this seems to be less the case for rich ones (panels in the middle). In line with Hypotheses H2, the poor living in poorer regions have higher levels of political resentment than the poor in richer regions, whereas rich households' attitudes are not significantly moderated by regional conditions.

The top-left panel shows that priming poor respondents on subjective perceptions of regional deprivation significantly decreases their preferences for democracy by up to 20% when compared to the control group. Since all our variables are standardized and marginal effects can be difficult to interpret, we also plot the predicted values (panels on the right), which document a difference in preferences for democracy between the poor and the rich living in the most deprived regions of up to 30%. Moreover, while only about 30% of the poor prefer democracy in the poorest region, about 70% of them do so in the richest region. These are sizeable magnitudes, taking into account that both individual and regional levels of deprivation were randomized in the context of a survey experiment. Note, however, that the negative effect among the poor is only significant for the poorest 40% of the regions in Britain. The level of political resentment among the poor living in richer regions is instead statistically indistinguishable from the rich, who do not seem to be affected by their regional circumstances.

A similar pattern emerges when analyzing satisfaction with democracy. Once again, subjective perceptions of deprivation among poor households decrease satisfaction, but only in the poorest half of the regions included in our study. Our treatment effects are statistically insignificant in richer regions. The only difference concerning preferences for democracy is that the slope of our conditional treatment effect is the same for the rich (who are marginally

[20] In other words we plot the marginal effect obtained by estimating equation (2) for the subjective treatment for two sub-groups.

more satisfied with democracy in very rich regions). The analysis of distrust in government shows yet again similar effects, i.e. poor individuals in poorer regions have significantly less trust in government. Lastly, we do not find significant differences between the poor and the rich in populist attitudes.

In sum, priming respondents simultaneously on regional and income deprivation, we find that regional deprivation significantly and strongly increases political resentment among poor individuals in poor regions, as measured by preferences for democracy, democratic satisfaction, and political distrust.

We focused on our subjective treatments of deprivation given that they drove most of our results in previous analyses (see Figure 2). Figure A.27 replicate the same analyses with objective information on deprivation. In this case, the results are comparable for the outcomes of democratic satisfaction and political distrust: while the poor significantly articulate strong levels of resentment when living in poor contexts, the results are not significant when living in better-off regions.

4.3 Causal mechanisms

Our analysis so far shows that subjective perceptions of regional deprivation are an important driver of political resentment, especially among poor households in poor regions. This confirms H1 and H2. In this section, we shed light on possible mechanisms behind this finding, hypothesizing two broad explanations. The first is based on economic self-interest: living in a less affluent LA can worsen expectations about individual economic circumstances. We capture this channel with questions on individual financial and employment prospects. The second focuses instead on whether living in a less prosperous area can impact non-economic dimensions like interpersonal trust and social status.[21]

Our goal is to unpack the mechanisms behind the main substantive results obtained in the previous section, where we observed that our findings were mainly driven by poor house-

[21] See Appendix D for the question wording and measurement of these items.

holds (bottom 20% of the income distribution). In particular, we aim to understand why our conditional treatment effects among the poor tend to be significant in poorer (bottom 50% of the regional GDP distribution) but not in richer regions (top 50%).

To this end, following Imai et al. (2011), we deploy causal mediation analysis, proceeding in three steps. First, we estimate the direct effects of our treatment on each mediator. We replicate the same analysis using different samples (poor vs rich local authorities) with valid and complete observations for each outcome. The second step consists of regressing our outcomes of interest on each mediator, one at a time while controlling for the treatment and other exogenous covariates. The final step calculates the Average Causal Mediation Effect (ACME) - i.e. the difference in the predicted outcome when regressing it on the predicted values of the mediator when the treatment is 1, and when the treatment is 0. To claim a significant mediated effect we should observe significant effects across the three steps.

In Table 1 we report the estimated coefficient of the treatment on each mediator (step 1). The top panel summarizes the results for poor local authorities, whereas the bottom panel focuses on the wealthier ones. Each row presents the estimated coefficient of the treatment on the mediator (e.g. economic prospects, unemployment prospects, etc.). Given that the sample of respondents for which we observe our measures of political resentment (e.g. democratic preferences, democratic satisfaction, etc.) varies slightly across outcomes due to item non-response, the Table reports the full set of coefficient estimates for each sub-sample.

The results indicate that when looking at poor households in poorer regions (top panel), the only coefficients consistently reaching statistical significance (5% level) are economic prospects and social status. More specifically, being exposed to the deprivation treatment increases the expectations of adverse economic prospects and decreases the perception of social status among poor respondents in poor LAs. By contrast, only the perception of social status has a significant coefficient when focusing on richer regions.

Table 2 reports the results of steps 2 and 3. Each row presents the estimated effect of each mediator on the outcome of interest (e.g. democratic preferences, democratic satisfaction,

Table 1: Effect of subjective regional treatment on mediator among the poor (bottom 20%)

	Poor local authorities (bottom 50%)			
Sub-sample	**Democratic preferences**	**Democratic satisfaction**	**Distrust government**	**Populism**
Adverse economic prospects	0.42**	0.43**	0.39*	0.42**
	(0.15)	(0.16)	(0.15)	(0.15)
N	230	206	224	230
Unemployment prospects	-0.08	-0.04	-0.08	-0.08
	(0.17)	(0.18)	(0.17)	(0.17)
N	146	136	145	146
Interpersonal trust	-0.52	-0.54	-0.48	-0.52
	(0.36)	(0.39)	(0.37)	(0.36)
Social status	-0.92**	-0.91**	-0.90**	-0.92**
	(0.32)	(0.35)	(0.32)	(0.32)
N	216	198	211	216
	Rich local authorities (top 50%)			
Sub-sample	**Democratic preferences**	**Democratic satisfaction**	**Distrust government**	**Populism**
Adverse economic prospects	-0.06	-0.05	-0.06	-0.12
	(0.02)	(0.21)	(0.21)	(0.20)
N	154	142	148	152
Unemployment prospects	0.06	0.06	0.06	0.10
	(0.25)	(0.25)	(0.26)	(0.25)
N	113	108	109	112
Interpersonal trust	0.70	-0.49	-0.64	-0.56
	(0.48)	(0.49)	(0.48)	(0.48)
N	151	142	147	150
Social status	-1.35**	-1.26**	-1.45***	-1.20**
	(0.41)	(0.42)	(0.42)	(0.41)
N	144	136	139	143

Significance levels: *** p< 0.001, ** p< 0.01, * p< 0.05. *Note*: Entries correspond to the linear effect of the treatment on each mediator (rows) using the sample with valid observations on each outcome (columns). Pre-treatment controls were included in all models (gender, age, and education). Standard errors between brackets.

etc.) controlling for treatment and other pre-treatment covariates, and the corresponding average causal mediation effect (ACME).

Focusing on the top panel (poorer regions), we can observe several interesting patterns. Both the impact of perceived economic prospects and their respective ACME reach conventional levels of statistical significance and are in the expected direction when predicting three out of four outcomes: democratic satisfaction, government distrust, and populism.

Table 2: Indirect effects of subjective regional treatment among the poor (bottom 20%)

	Poor local authorities (bottom 50%)			
Outcome	**Democratic preferences**	**Democratic satisfaction**	**Distrust government**	**Populism**
Adverse economic prospects	0.01	-0.19***	0.26***	0.11**
	(0.03)	(0.05)	(0.04)	(0.04)
ACME	0.003	-0.08**	0.10*	0.05*
Unemployment prospects	-0.07	-0.09	0.03	0.07
	(0.05)	(0.08)	(0.07)	(0.06)
ACME	0.01	0.003	-0.002	-0.01
Interpersonal trust	0.01	0.12***	-0.05**	-0.03
	(0.01)	(0.02)	(0.02)	(0.02)
ACME	-0.01	-0.06	0.03	0.02
Social status	-0.01	0.1***	-0.08***	-0.01
	(0.2)	(0.03)	(0.02)	-0.02
ACME	0.01	-0.09**	0.07**	0.01
Outcome	**Democratic preferences**	**Democratic satisfaction**	**Distrust government**	**Populism**
Adverse economic prospects	-0.05	-0.19**	0.19**	0.10
	(0.04)	(0.07)	(0.06)	(0.05)
ACME	0.003	0.01	-0.01	-0.01
Unemployment prospects	-0.08	-0.14	0.02	0.10
	(0.04)	(0.08)	(0.07)	(0.06)
ACME	-0.005	-0.01	0.001	0.01
Interpersonal trust	0.02	0.12***	-0.05	-0.01
	(0.02)	(0.03)	(0.03)	(0.02)
ACME	-0.02	-0.06	0.03	0.01
Social status	-0.03	0.08*	-0.05	0.01
	(0.02)	(0.04)	(0.03)	(0.03)
ACME	0.04	-0.1*	0.07	-0.01

Significance levels: *** p< 0.001, ** p< 0.01, * p< 0.05. OLS models regress each outcome (columns) on each mediator of interest (rows) while controlling for the subjective regional inequality treatment (vs the control) and pre-treatment covariates (gender, age, and education). Coefficient estimates and standard errors between brackets. ACMEs are calculated via nonparametric bootstrapped methods (1,000 simulations).

This means that being reminded of deprivation worsened the perceived economic prospects of the poor in poor regions (see Table 1), and this in turn increases their political resentment. The indirect effects of social status are also significant at conventional levels, and in the expected direction, when predicting democratic satisfaction and government distrust. In other

words, when prompted to think about deprivation, poor individuals in poor regions perceive lower social status, which in turn leads to an increase in political resentment.

Contrary to the significant effects observed among poor households in poor regions, we do not find significant indirect effects for poor households in rich regions (see lower panel in Table 2 and Table 1). This means that, with only one exception (the indirect effect of social status on democratic satisfaction), the distribution of perceptions about financial and employment prospects, as well as interpersonal trust and social status, are the same between the treated and the control group.

5 Conclusions

Our analysis – based on a well-powered experimental design implemented in Great Britain – provides novel causal evidence that subjective perceptions of both individual and regional deprivation increase political resentment. More importantly, it reveals that contextual deprivation significantly shapes the relationship between individual circumstances and political attitudes. Poorer individuals residing in poorer regions exhibit stronger anti-democratic sentiments, lower satisfaction with democracy, and reduced trust in government. On the other hand, the political attitudes of poor individuals living in rich regions are broadly indistinguishable from those of wealthier individuals. In other words, individual relative deprivation does not necessarily foster resentment: only when the poor live in left behind regions anti-systemic attitudes emerge because of deprivation.

Our findings have important implications for place-based policies which have gained prominence in the agenda of several governments. While there is abundant evidence that regional economic decline plays a key role, our analysis shows its effect on political behavior is crucially mediated by individual circumstances. On the one hand, investing in disadvantaged areas can significantly reduce anti-systemic attitudes by affecting expectations on future economic prospects, even if current individual circumstances remain unchanged. On the other, because individuals in poorer regions are particularly responsive to local economic signals, such interventions will only be effective if they prompt an update in the subjective

beliefs of those most attuned to the local context.

Finally, our analysis has focused on the relative income positions of individuals and regions, abstracting from multiple potential drivers of material conditions, such as globalization forces (e.g. trade and immigration), automation, housing prices, etc. Since individual responses to relative deprivation may well vary depending on their perceived cause, our experimental approach could be applied in future research to tackle these important questions.

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Supplementary Material

Regional Deprivation and Political Resentment

Contents

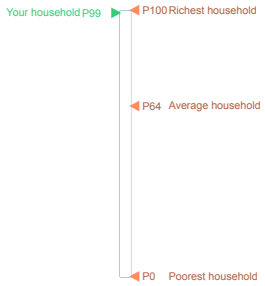
A. Appendix: Illustrations experimental treatments

Figure A.1: T1 - Objective income

We will now provide you information about inequality in the UK based on official statistics. The slider below shows the ranking of comparable UK households based on their total income. The poorest households are at the bottom of the slider (position P0). The richest households are at the top of the slider (position P100). The slider indicates the average UK household income (position P64).

From the slider you can also find out the percentage of UK households earning less than the average: P64 means that 64 percent of UK household earn less than the UK average. This also means that 36 percent of UK households earn more than the UK average.

We also show you your own ranking on the slider. You said that your household income is 200000, on the slider below you are on position P99, this means that 99 percent of comparable UK households earn LESS than you.



Given this information, what percentage of households then earn MORE than you?

Figure A.2: T2 - Subjective income

We will now provide you information about inequality in the UK based on official statistics. The slider below shows the ranking of comparable UK households based on their total income. The poorest households are at the bottom of the slider (position P0). The richest households are at the top of the slider (position P100).

From the slider you can also find out the percentage of UK households earning less than the average: P64 means that 64 percent of UK household earn less than the UK average. This also means that 36 percent of UK households earn more than the UK average.

We will now ask you to show where you think you are on the slider ranking UK household similar to yours.

You said that your income is 200000. How do how do you think it compares to similar households in the UK? Choose your position on the slider.

Given your guess, what percentage of households would then earn MORE than you?

Figure A.3: T3 - Objective regional GDP

We will now provide you information about regional inequality in the UK based on official statistics. The slider below shows the ranking of UK local authorities based on their economic performance (e.g. GDP per person). The poorest local authorities are at the bottom of the slider (position P0). The richest local authorities are at the top of the slider (position P100).

The slider also indicates the average UK economic performance (position P72). From the slider you can find out the percentage of local authorities with economic performance worse than the UK average: P72 means that 72 percent of UK local authorities performs worse that the UK average. This also means that 28 percent of local authorities performs better than the UK average.

We also show you the ranking of your local authority on the slider.

You said that you live in Nottingham. On the slider below your local authority is on position P80, this means that 80 percent of local authorities performs WORSE than yours.

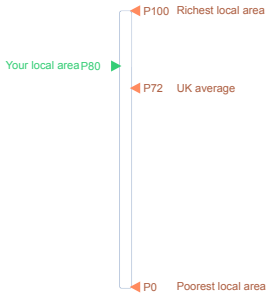


Figure A.4: T4 - Subjective regional GDP

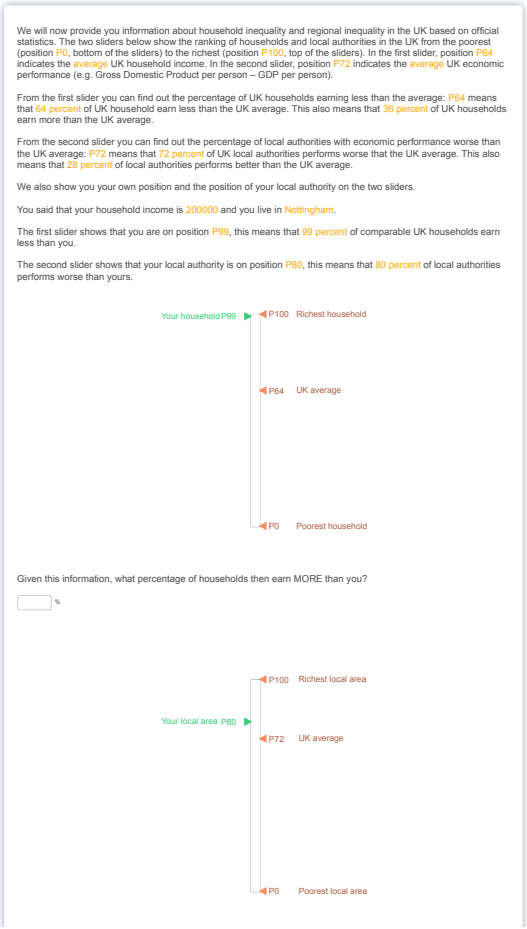
We will now provide you information about regional inequality in the UK based on official statistics. The slider below shows the ranking of UK local authorities based on their economic performance (e.g. Gross Domestic Product per person – GDP per person). The poorest local authorities are at the bottom of the slider (position P0). The richest local authorities are at the top of the slider (position P100).

The slider also indicates the average UK economic performance (position P72). From the slider you can find out the percentage of local authorities with economic performance worse than the UK average: P72 means that 72 percent of UK local authorities performs worse that the UK average. This also means that 28 percent of local authorities performs better than the UK average.

We will now ask you to rank your local authority economic performance using the slider comparing all UK local authorities.

You said that you live in Nottingham. How do you think the economic performance (in terms of Gross Domestic Product - GDP) of your local authority compares to others in the UK? Choose the position of your local authority on the slider.

Figure A.5: T6 - Objective income + regional GDP



B. Appendix: Ethical consideration of research

This research relies on the contribution of human participants and adheres to the APSA Principles and Guidance for Human Subjects Research. The study was peer-reviewed and received ethical approval (number: XXX) from the University of XXX [anonymized for peer-review] Ethics Board before any data collection commenced. Here we briefly address some key ethical concerns arising from this study.

Participant recruitment and questionnaire: Research participants were recruited via an existing pool of survey participants curated by the company DeltaPoll. After accepting an invitation to participate in the survey from the company, they were directed to a landing page, where they were first shown the Participant Information Sheet (PIS). The PIS included details about the research, the intended purpose (research project), the duration of the survey (15min), funding details of the project, and contact details for the research team and ethics board. We also provided participants with information on how their data will be stored and that participation is voluntary and can be ended at any time. Only after people have read these details and consented to their participation, were they taken to the survey.

We do not see any significant ethical risks for the participants of this study. The questionnaire included questions on political attitudes, which might be considered sensitive. However, all questions included have been verified by existing, peer-reviewed research and are commonly used in political science. We, therefore, do not believe that these questions led to any undue psychological harm.

Participant compensation: No direct financial incentives were provided. Still, respondents received virtual tokens that can be ultimately exchanged for money or vouchers.

Informational treatments: Treated participants were exposed to an informational treatment about their relative income position and/or economic prosperity position of their local authority. Any information provided to individuals was factual, based on the details provided by the participant, e.g. their household income and composition and their postcode. Therefore, the study does not include any deception.

Data protection: There are no risks of identifying individuals in our data. Participants were in full control of whether and how much they wished to participate in the study. The only personal information collected from participants was their postcode, which was needed to correctly collect information on where people live, which is the main purpose of this study. The researchers do not have access to the raw postcode data, but only the local authority code of the respondents. DeltaPoll destroyed the sensitive data once data was collected. All data is stored on password-protected computers.

C. Appendix: Power calculations

We assumed a 95% level of statistical significance and an 80% power. We also assume a difference in outcome means of 0.25 (which would be a 5% difference on a 1-5 Likert scale measuring populist attitudes, based on the wording and measurement available in wave 20 of the British Election Study, fielded in June 2020), and a standard deviation of the outcome of 0.7 (on the basis of the very same indicator and dataset above). This means that our expected standardized difference (difference in means / standard deviation) equals 0.36. According to these parameters one would need a sample size of at least 247 individuals per treatment-group (`https://egap.shinyapps.io/Power_Calculator/`.

We have considered 12 experimental groups: control, 5 average treatments (objective household inequality, objective regional inequality, subjective household inequality, subjective regional inequality, regional growth), and 6 conditional treatments (groups getting both individual and regional information are low/middle/high GDP region X low/high household income). Thus, we would need a total sample size of 247 X 12 = 2,964. By aiming at 6,000 respondents we have about twice of what is required.

D. Appendix: Question-wording and description of the outcome variables

1. **Democratic preference**: Which of the following statements comes closest to your own view?
    - Democracy is preferable to any other kind of government
    - Under some circumstances, an authoritarian government can be preferable to a democratic one
    - For people like me, it doesn't matter whether we have a democratic or non-democratic regime
    - Don't know
2. **Democratic satisfaction**: Taking everything into account, how satisfied or dissatisfied are you with the way that democracy works in the UK as a whole [scale 1-4]?
3. **Distrust in government**: How much of the time do you think you can trust the government in Westminster to do what is right [scale 1-4]?
4. **Populism index**: Please say if you agree or disagree with each of the following statements [strongly agree to strongly disagree scale]
    - The politicians in the UK parliament need to follow the will of the people.
    - Elected officials talk too much and take too little action.
    - I would rather be represented by a citizen than by a specialized politician.
    - The people, and not politicians, should make the most important policy decisions.

Descriptives outcome variables (survey 1)

Table A.1: Descriptives outcome variables

	Obs	Mean	Std. Dev.	Min	Max
Democratic preference	6,002	0.62	0.48	0	1
Democratic satisfaction	5,676	2.62	0.90	1	4
Distrust in government	5,852	3.08	0.81	1	4
Populism index	5,956	3.85	0.73	1	5

Table A.2: Pairwise correlation of outcome variables

	Democratic pref.	Democratic sat.	Distrust in gov.	Populism
Democratic pref.	1			
Democratic sat.	0.13	1		
Distrust in gov.	-0.01	-0.53	1	
Populism	-0.01	-0.20	0.31	1

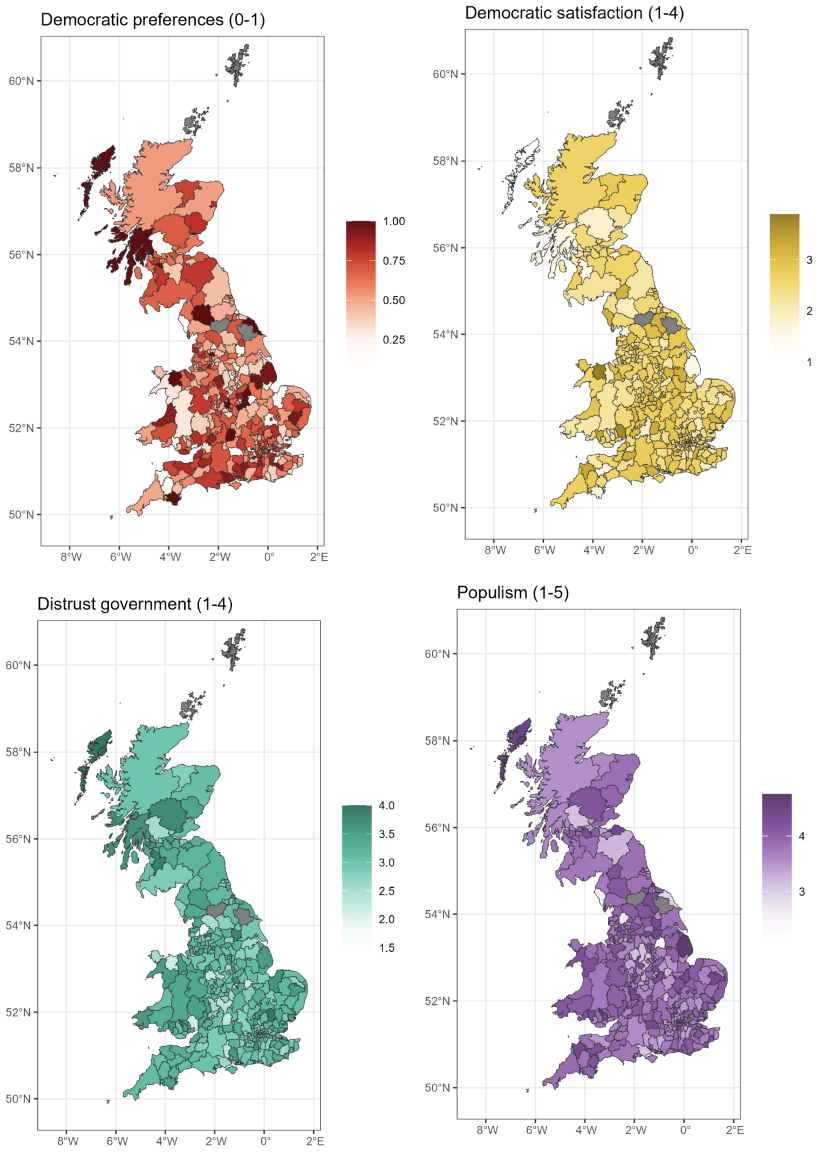
Table A.3: Explorative principle component analysis of outcome variables: Factor loadings (factors with eigenvalue > 1)

	Factor 1	Unexplained
Democratic preference	-0.20	0.93
Democratic satisfaction	-0.61	0.37
Distrust in government	0.61	0.35
Populism index	0.46	0.63

Mediating variables

- **Prospective financial situation:** 'How do you think your personal economic situation will change over the next 12 months?' (coded on a 1-5 scale from 'it will get a lot better' to 'it will get a lot worse'.
- **Unemployment prospects:** 'If you had to say, how likely do you think it is, if at all, that during the next 12 months you will be unemployed and looking for work for at least four consecutive weeks?' (coded on a 1-4 scale from 'not at all likely' to 'very likely').
- **Interpersonal trust:** 'Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?' (coded on a 0-10 scale from 'You can't be too careful' to 'Most people can be trusted').
- **Social status:** 'In our society there are groups which tend to be towards the top and groups which tend to be towards the bottom. Where would you put yourself on a scale from the bottom to the top?' (coded on a 0-10 scale from 'bottom' to 'top').

Figure A.6: Regional distribution of outcome variables



E. Appendix: Data

We collected data in two rounds of surveys. The first survey (data collection: April 2022) included all, but one treatment. The second survey (data collection: August 2023) included only the control and one treatment group, the cross-over subjective treatment. The study design, questionnaire, and participant recruitment were strictly the same.

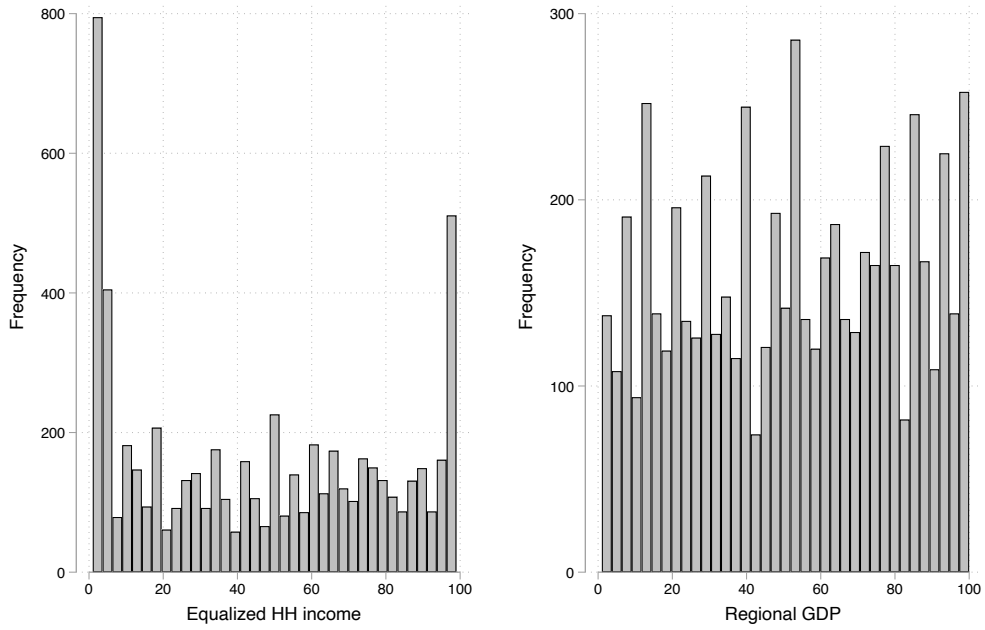
Table A.4: Number of observations per treatment arm: Survey 1

Group	Sample Size
Individual Objective	600
Individual Subjective	602
Regional Objective	600
Regional Growth Objective	600
Regional Subjective	601
Individual Objective/Regional Objective	1,999
Control Group	1,000
Total	6,000

Table A.5: Number of observations per treatment arm: Survey 2

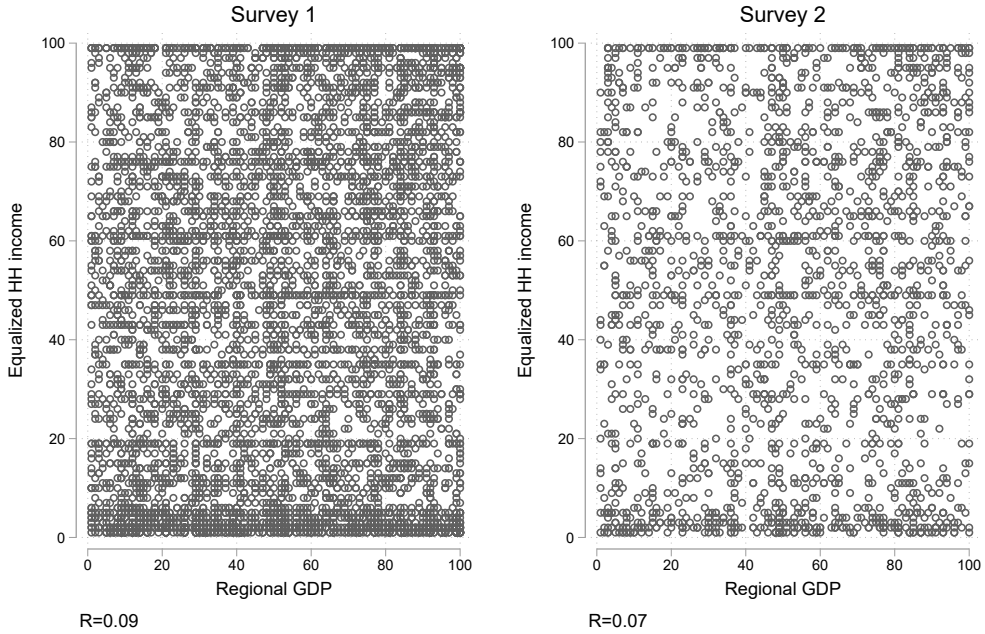
Group	Sample Size
Individual Subjective/Regional Objective	1,001
Control Group	999
Total	2,000

Figure A.7: Distribution of respondents' HH income and regional GDP (survey 1)



Sources: Family Resource Survey and Office of National Statistics (ONS)

Figure A.8: Scatterplot between HH income and region GDP percentiles (survey 1+2)



Sources: Family Resource Survey and Office of National Statistics (ONS)

Comparing sample characteristics with the 2019 British Election Study (BES) data

To assess the quality and representatives of our survey, we compare key demographic characteristics to the 2019 British Election Study face-to-face survey, which is based on a probability sample based on UK eligible voters and includes 3,946 respondents.[1] To calculate descriptive statistics for the BES data, we use the population weight [wt_demog].

Table A.6: Sample comparison with 2019 BES data

	Survey 1	Survey 2	BES 2019
Age (mean)	48.3	46.7	49.6
Female (%)	47.9	50.7	50.9
Highest degree (%)			
Below secondary	0.6	0.4	24.8
Secondary	38.8	34.6	35.3
Degree	60.7	65.0	39.9
White (%)	90.9	86.6	87.1
Housing (%)	67.9	63.8	69.5
Political interest	6.6	6.5	5.7

[1] Data and further details can be accessed via: `https://www.britishelectionstudy.com/data-object/2019-british-election-study-post-election-random-probability-survey/`.

F. Appendix: Balance tests

Figure A.9: Balance test of treatment groups vs control group (survey 1)

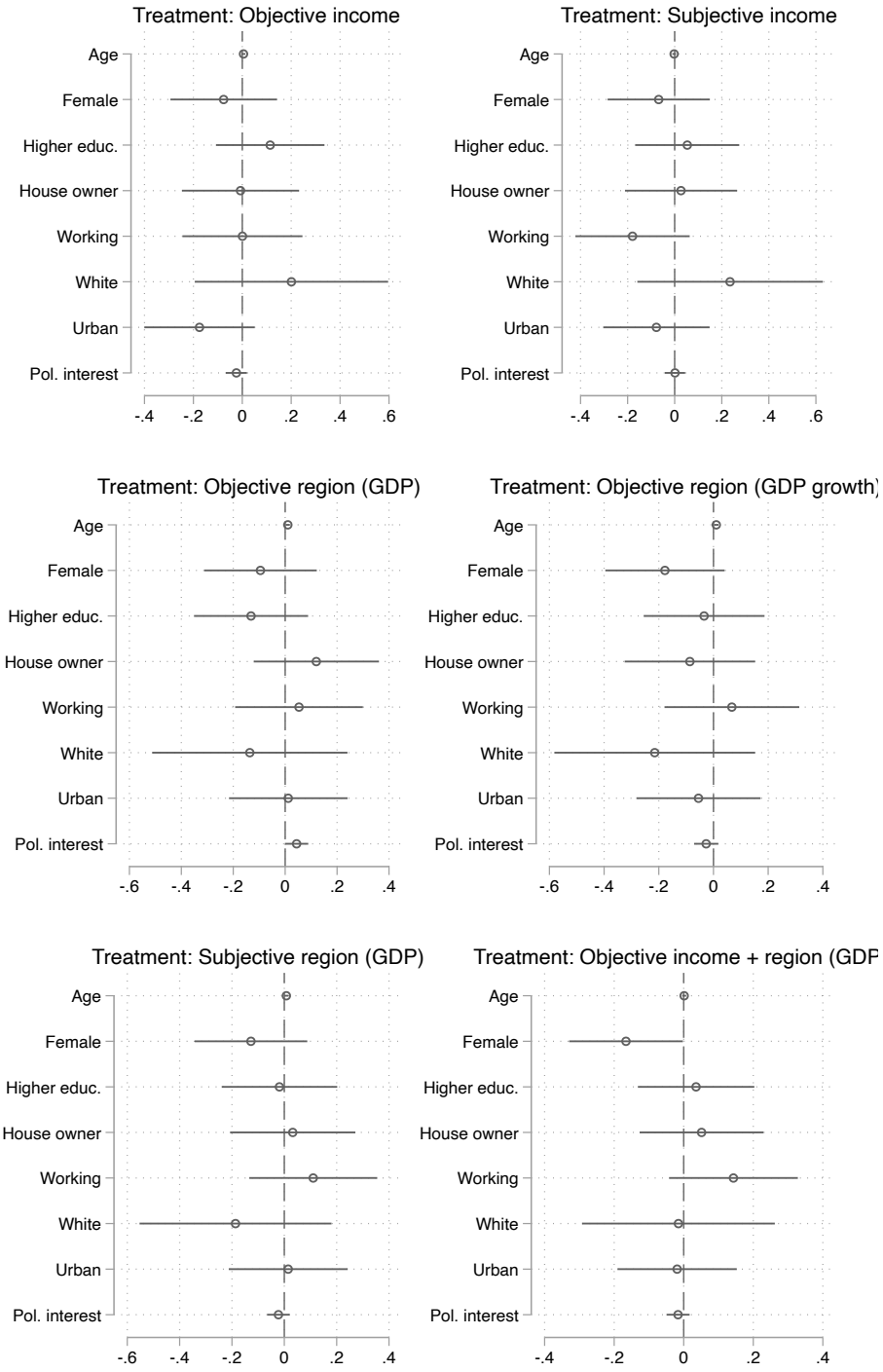
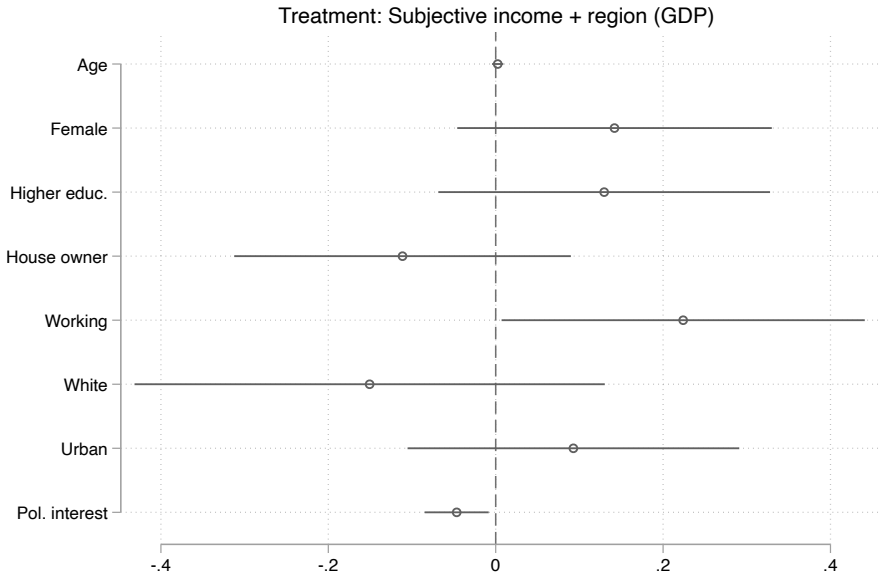
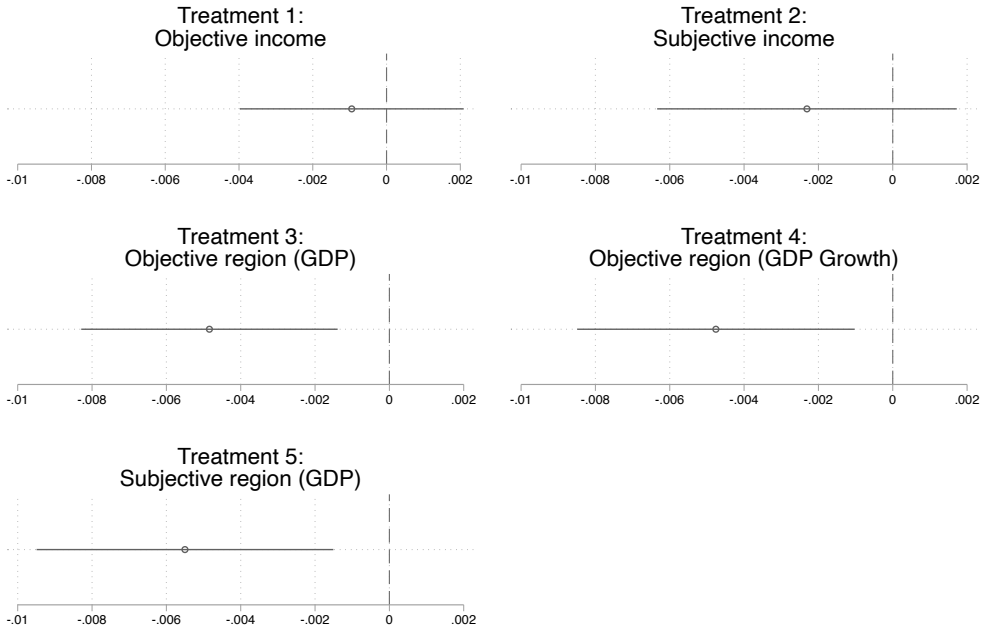


Figure A.10: Balance test of treatment groups vs control group (survey 2)



G. Appendix: Manipulation check of treatments: Concerns over inequality

Figure A.11: Impact on concerns over inequality (DV)



Note: Standardized coefficients and 95% c.i. of interaction between treatment and income/region GDP on concerns over inequality.

H. Appendix: Additional results main effects

H.1. Full results of main effects and robustness tests

Table A.7: Full results and robustness tests: Treatment - Objective income

Outcome	Democratic preference				Democratic satisfaction				Government distrust				Populism			
Treatment: Objective income	-0.19*	-0.21*	0.03	-0.19*	-0.09	-0.07	-0.18	-0.06	0.19*	0.18*	0.26*	0.17*	-0.03	-0.05	-0.05	-0.03
	[0.09]	[0.08]	[0.11]	[0.09]	[0.09]	[0.09]	[0.11]	[0.09]	[0.09]	[0.09]	[0.10]	[0.09]	[0.09]	[0.09]	[0.10]	[0.09]
Objective income	0.00**	-0	0.00**	0.00**	0.00**	0	0.00**	0.00*	-0.00**	-0	-0.00**	-0.00**	-0.00**	-0.00*	-0.00**	-0.00*
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Treatment x Obj. Income	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Age		0.01**				0.00				0.00				-0.00*		
		[0.00]				[0.00]				[0.00]				[0.00]		
Female		-0.15**				-0.08				0.12*				0.06		
		[0.05]				[0.05]				[0.05]				[0.05]		
Higher educ.		0.18**				0.07				-0.10				-0.14*		
		[0.05]				[0.05]				[0.05]				[0.05]		
House owner		0.13*				0.31**				-0.06				-0.16**		
		[0.05]				[0.06]				[0.06]				[0.06]		
Working		0.03				0.02				0.01				0.19**		
		[0.06]				[0.06]				[0.06]				[0.06]		
White		0.1				-0.14				0.15				0.09		
		[0.09]				[0.09]				[0.09]				[0.09]		
Urban		-0.03				0.15**				-0.04				-0.06		
		[0.05]				[0.06]				[0.06]				[0.05]		
Pol. interest		0.09**				0.05**				-0.03*				0.01		
		[0.01]				[0.01]				[0.01]				[0.01]		
Error < 5	no	no	yes	no	no	no	yes	no	no	no	yes	no	no	no	yes	no
Region dummies	no	no	no	yes	no	no	no	yes	no	no	no	yes	no	no	no	yes
Constant	-0.08	-1.30**	-0.08	-0.16	-0.05	-0.43**	-0.05	-0.09	0.07	0.16	0.07	0.11	0.11*	0.22	0.11*	0.1
	[0.05]	[0.15]	[0.05]	[0.08]	[0.05]	[0.17]	[0.05]	[0.09]	[0.05]	[0.17]	[0.05]	[0.08]	[0.05]	[0.16]	[0.05]	[0.08]
Observations	1,600	1,539	1,398	1,600	1,509	1,462	1,321	1,509	1,566	1,518	1,373	1,566	1,589	1,533	1,388	1,589
R^2	0.017	0.15	0.01	0.03	0.01	0.062	0.012	0.053	0.016	0.034	0.016	0.05	0.007	0.036	0.009	0.019

Significance levels: ** $p < 0.01$; * $p < 0.05$. Entries report regression coefficient and their standard errors.

Table A.8: Full results and robustness tests: Treatment - Subjective income

Outcome	Democratic preference				Democratic satisfaction				Government distrust				Populism			
Treatment: Subjective income	-0.26*	-0.2	-0.28	-0.25*	-0.36**	-0.30*	-0.41*	-0.37**	0.23*	0.23	0.46*	0.23*	0.05	0.1	0.03	0.05
	[0.11]	[0.11]	[0.18]	[0.11]	[0.12]	[0.12]	[0.18]	[0.12]	[0.12]	[0.12]	[0.19]	[0.12]	[0.11]	[0.12]	[0.18]	[0.11]
Subjective income	0.00**	0.00	0.00**	0.00**	0.00**	0.00	0.00**	0.00*	-0.00**	0.00	-0.00**	-0.00*	-0.00**	-0.00*	-0.00**	-0.00*
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Treatment x subj. Income	0.00	0.00	0.01*	0.00	0.01*	0.00	0.01	0.01**	0.00	0.00	-0.01*	0.00	0.00	0.00	-0.01	0.00
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Age		0.01**				-0				-0				-0.01**		
		[0.00]				[0.00]				[0.00]				[0.00]		
Female		-0.06				-0.08				0.1				0.08		
		[0.05]				[0.05]				[0.05]				[0.05]		
Higher educ.		0.17**				0.03				-0.05				-0.14**		
		[0.05]				[0.05]				[0.05]				[0.05]		
House owner		0.15**				0.34**				-0.05				-0.13*		
		[0.05]				[0.06]				[0.06]				[0.06]		
Working		-0.02				0				-0.06				0.1		
		[0.06]				[0.06]				[0.06]				[0.06]		
White		0.13				0				0.1				0.09		
		[0.09]				[0.09]				[0.09]				[0.09]		
Urban		0.02				0.14*				-0.03				-0.02		
		[0.05]				[0.06]				[0.06]				[0.05]		
Pol. interest		0.09**				0.03**				-0.02				0.03*		
		[0.01]				[0.01]				[0.01]				[0.01]		
Error < 5	no	no	yes	no	no	no	yes	no	no	no	yes	no	no	no	yes	no
Region dummies	no	no	no	yes	no	no	no	yes	no	no	no	yes	no	no	no	yes
Constant	-0.08	-1.44**	-0.08	-0.08	-0.05	-0.35*	-0.05	-0.02	0.07	0.23	0.07	0.13	0.11*	0.16	0.11*	0.20*
	[0.05]	[0.15]	[0.05]	[0.08]	[0.05]	[0.17]	[0.05]	[0.09]	[0.05]	[0.17]	[0.05]	[0.08]	[0.05]	[0.16]	[0.05]	[0.08]
Observations	1,602	1,537	1,237	1,602	1,509	1,459	1,169	1,509	1,557	1,505	1,204	1,557	1,587	1,528	1,226	1,587
R^2	0.013	0.156	0.016	0.021	0.017	0.054	0.014	0.034	0.011	0.021	0.014	0.027	0.007	0.036	0.021	0.018

Significance levels: ** $p < 0.01$; * $p < 0.05$. Entries report regression coefficient and their standard errors.

Table A.9: Full results and robustness tests: Treatment - Objective regional GDP

Outcome	Democratic preference				Democratic satisfaction				Government distrust				Populism			
Treatment: Objective region GDP	0.16	0.05	0.28*	0.15	-0.16	-0.19	-0.28*	-0.15	0.06	0.09	0.1	0.05	-0.04	0.03	-0.06	-0.05
	[0.11]	[0.10]	[0.12]	[0.11]	[0.11]	[0.11]	[0.13]	[0.11]	[0.11]	[0.11]	[0.12]	[0.11]	[0.11]	[0.11]	[0.13]	[0.11]
Objective region GDP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Treatment x obj. Region	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Age		0.01**				0				-0				-0.01**		
		[0.00]				[0.00]				[0.00]				[0.00]		
Female		-0.11*				-0.06				0.11*				0.09		
		[0.05]				[0.05]				[0.05]				[0.05]		
Higher educ.		0.19**				0.05				-0.11*				-0.19**		
		[0.05]				[0.05]				[0.05]				[0.05]		
House owner		0.24**				0.38**				-0.12*				-0.16**		
		[0.05]				[0.06]				[0.06]				[0.06]		
Working		0.04				0.05				-0.11				0.13*		
		[0.05]				[0.06]				[0.06]				[0.06]		
White		0.06				-0.11				0.21*				0.19*		
		[0.08]				[0.09]				[0.09]				[0.09]		
Urban		-0.01				0.11*				0.07				0.03		
		[0.05]				[0.06]				[0.06]				[0.06]		
Pol. interest		0.08**				0.03**				-0.01				0.03**		
		[0.01]				[0.01]				[0.01]				[0.01]		
Error < 5	no	no	yes	no	no	no	yes	no	no	no	yes	no	no	no	yes	no
Region dummies	no	no	no	yes	no	no	no	yes	no	no	no	yes	no	no	no	yes
Constant	-0.05	-1.47**	-0.05	-0	0.02	-0.43*	0.02	0.07	0.06	0.2	0.06	0.07	0.08	0.18	0.08	0.08
	[0.06]	[0.15]	[0.06]	[0.09]	[0.07]	[0.17]	[0.07]	[0.09]	[0.07]	[0.17]	[0.07]	[0.09]	[0.07]	[0.17]	[0.07]	[0.09]
Observations	1,600	1,544	1,400	1,600	1,517	1,476	1,326	1,517	1,566	1,523	1,369	1,566	1,588	1,539	1,390	1,588
R^2	0.003	0.163	0.011	0.013	0.004	0.053	0.007	0.027	0.004	0.027	0.006	0.021	0.002	0.05	0.005	0.011

Significance levels: ** $p < 0.01$; * $p < 0.05$. Entries report regression coefficient and their standard errors.

Table A.10: Full results and robustness tests: Treatment - Subjective regional GDP

Outcome	Democratic preference				Democratic satisfaction				Government distrust				Populism			
Treatment: Subjective region GDP	-0.19	-0.15	-0.04	-0.21	-0.47**	-0.43**	-0.59**	-0.48**	0.43**	0.42**	0.59**	0.43**	0.25*	0.24	0.36	0.24
	[0.12]	[0.12]	[0.18]	[0.12]	[0.13]	[0.13]	[0.19]	[0.13]	[0.13]	[0.13]	[0.19]	[0.12]	[0.12]	[0.12]	[0.18]	[0.12]
Subjective region GDP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Treatment x subj. Region	0.00	0.00	0.00	0.00	0.01**	0.01**	0.01**	0.01**	-0.01**	-0.01**	-0.01**	-0.01**	-0.00*	0.00	-0.01**	-0.00*
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Age		0.01**				-0				-0				-0.01**		
		[0.00]				[0.00]				[0.00]				[0.00]		
Female		-0.11*				-0.08				0.12*				0.13*		
		[0.05]				[0.05]				[0.05]				[0.05]		
Higher educ.		0.18**				0.09				-0.17**				-0.1		
		[0.05]				[0.05]				[0.05]				[0.05]		
House owner		0.14**				0.28**				-0.07				-0.18**		
		[0.05]				[0.06]				[0.06]				[0.06]		
Working		-0.02				0.02				-0.02				0.08		
		[0.05]				[0.06]				[0.06]				[0.06]		
White		0.13				-0.18				0.25**				0.15		
		[0.08]				[0.09]				[0.09]				[0.09]		
Urban		-0.02				0.07				-0.01				0.03		
		[0.05]				[0.06]				[0.06]				[0.05]		
Pol. interest		0.09**				0.04**				-0.03**				0.03**		
		[0.01]				[0.01]				[0.01]				[0.01]		
Error < 5	no	no	yes	no	no	no	yes	no	no	no	yes	no	no	no	yes	no
Region dummies	no	no	no	yes	no	no	no	yes	no	no	no	yes	no	no	no	yes
Constant	-0.05	-1.49**	-0.05	-0.05	0.02	-0.26	0.02	-0	0.06	0.23	0.06	0.13	0.08	0.08	0.08	0.08
	[0.07]	[0.15]	[0.06]	[0.09]	[0.07]	[0.17]	[0.07]	[0.09]	[0.07]	[0.17]	[0.07]	[0.09]	[0.06]	[0.16]	[0.06]	[0.09]
Observations	1,601	1,543	1,253	1,601	1,513	1,470	1,186	1,513	1,565	1,520	1,227	1,565	1,590	1,538	1,245	1,590
R^2	0.007	0.164	0.009	0.021	0.015	0.056	0.011	0.043	0.018	0.046	0.015	0.042	0.009	0.046	0.012	0.017

Significance levels: ** $p < 0.01$; * $p < 0.05$. Entries report regression coefficient and their standard errors.

H.2. T-Tests of treatment effects

In this section, we present t-tests following a seemingly unrelated estimation of two treatments, comparing the relative strength of the treatments. Here we are testing how likely it is that two interaction effects (e.g. treatment x income) are the same across two different treatments. Table A.11 reports the p-values of the different models and their comparative impact on our various outcomes.

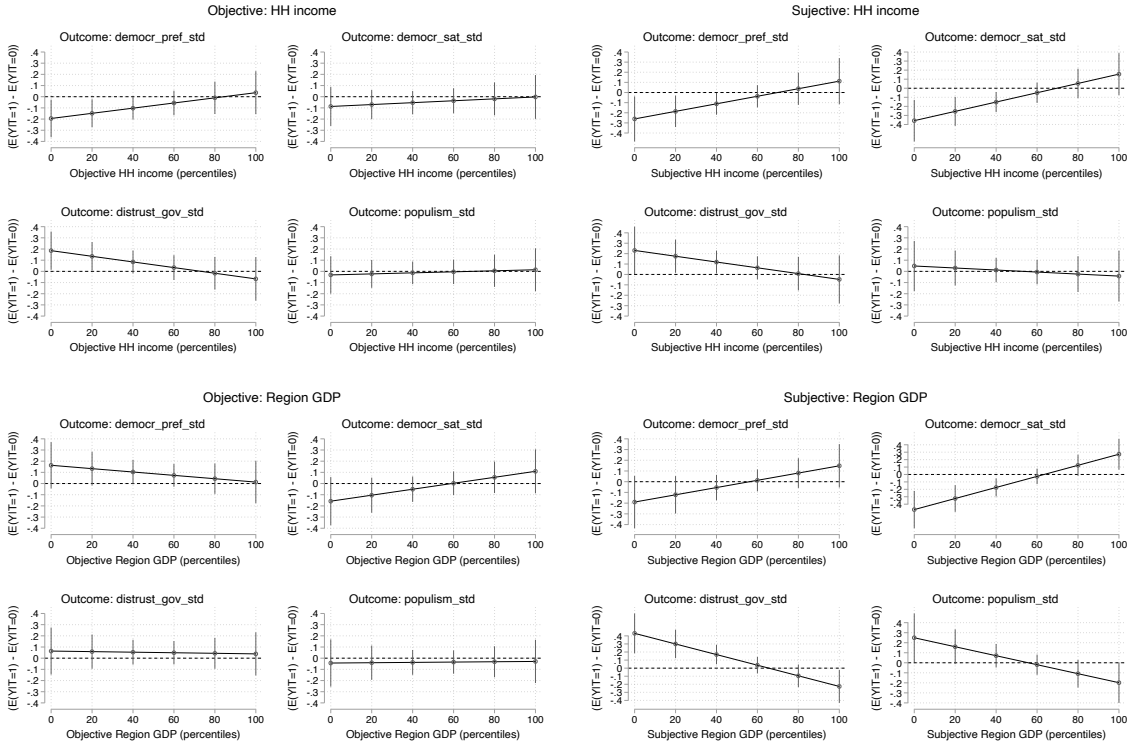
Table A.11: T-Tests of treatment effects (p-values)

	Democ. Pref.	Democ. Sat.	Gov. Distrust	Populism
Region: Subjective is stronger than objective	0.028	0.047	0.008	0.044
Income: Subjective is stronger than objective	0.521	0.075	0.909	0.542
Subjective: Individual stronger than region	0.905	0.464	0.211	0.224

Significance levels: ** $p < 0.01$; * $p < 0.05$.

H.3. Marginal effects of treatments

Figure A.12: Marginal effects of treatments on outcomes using continues individual income and region GDP

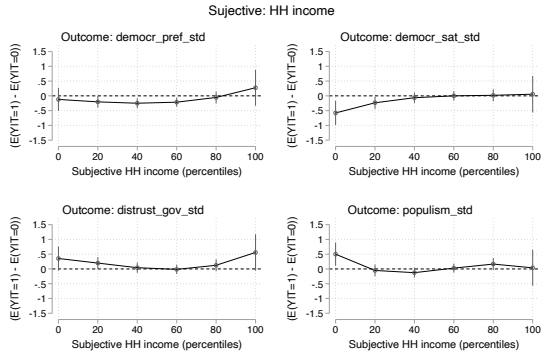


Note: Standardized coefficients and 95% c.i. of treatment.

H.4. Non-linear marginal effects of treatments

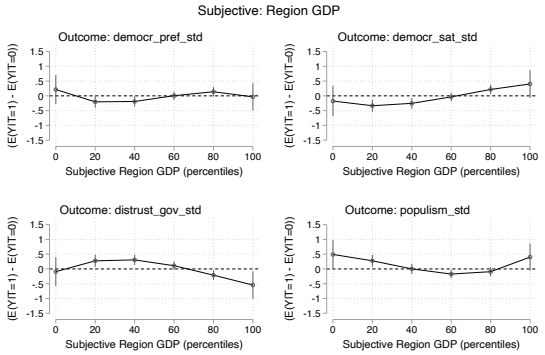
In this section we present the marginal effects of our subjective treatments using third order polynomial specifications for the individual (Figure A.13) and regional (Figure A.14) subjective treatments.

Figure A.13: Marginal effects of SUBJECTIVE income treatment on outcomes



Note: Standardized coefficients and 95% c.i. of treatment.

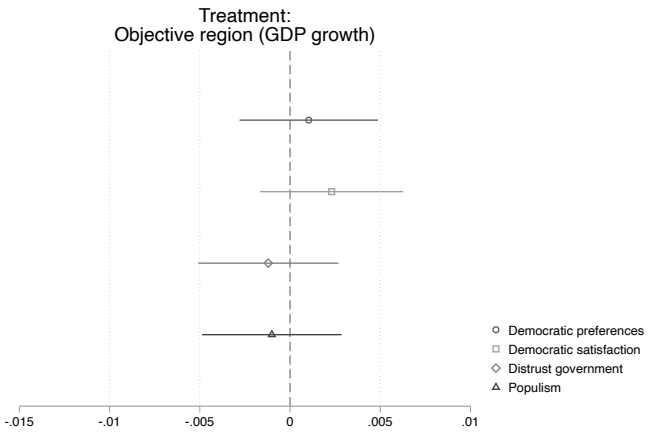
Figure A.14: Marginal effects of SUBJECTIVE region GDP treatment on outcomes



Note: Standardized coefficients and 95% c.i. of treatment.

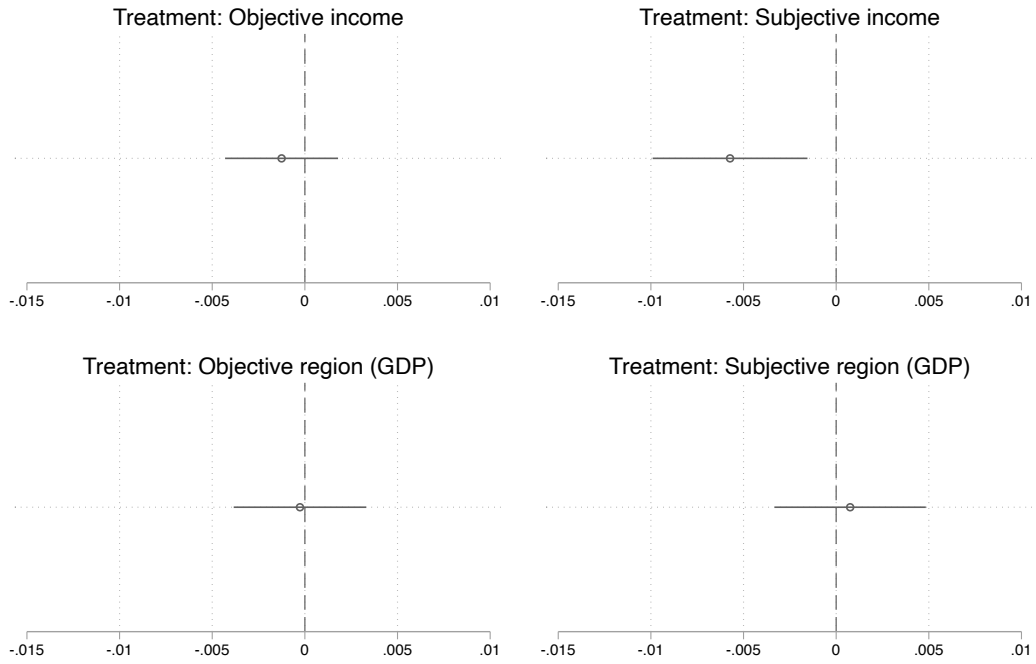
H.5. Main effects of GDP growth treatment

Figure A.15: Results: Effects of treatment 4 (GDP growth)



Note: Standardized coefficients and 95% c.i. of interaction between treatment and region GDP growth on political resentment outcomes.

Figure A.16: Results: Main effects of treatments on political resentment



Note: Standardized coefficients and 95% c.i. of interaction between treatment and income/region GDP.

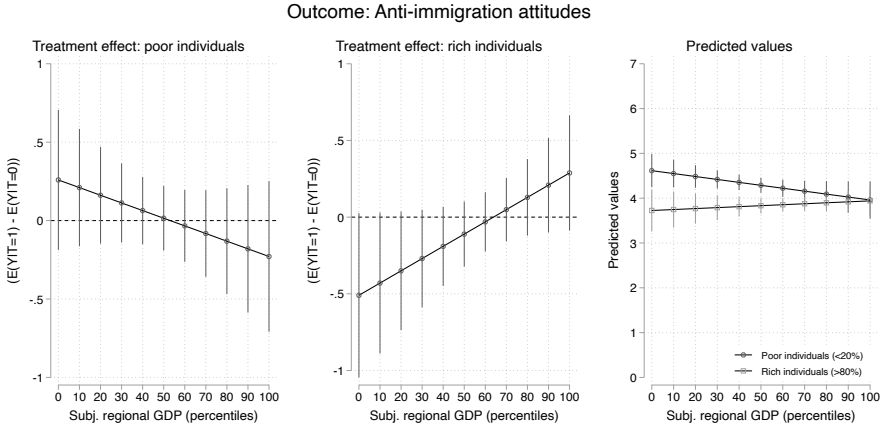
H.6. Additional outcome: Anti-immigration attitudes

In this section, we present the main treatment effects on an additional, pre-registered outcome, measuring anti-immigration attitudes. The variable was measured using an index of the following statements:

- Taking everything into account, how restrictive, if at all, do you think the United Kingdom's immigration policy should be? Please say using the following scale where 1 means 'Not at all restrictive' and 7 means 'Extremely restrictive'.
- Generally speaking, do you think immigration is good or bad for Britain's economy? Please say using the following scale where 1 means 'Very bad for the economy' and 7 means 'very good for the economy'.
- And again, generally speaking, do you think that immigration undermines or enriches Britain's cultural life? Please say using the following scale where 1 means 'Undermines Britain's cultural life' and 7 means 'Enriches Britain's cultural life'.

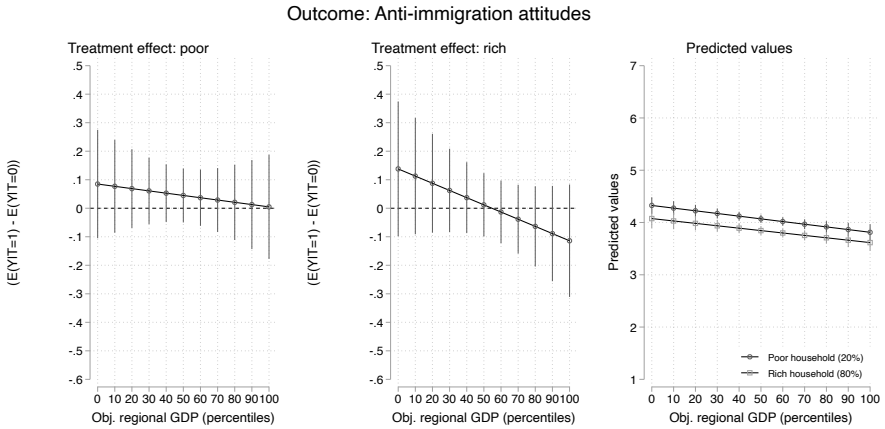
Here we report the main effect of the treatments on anti-immigrant attitudes in Figure A.16 and the impact of individual and regional congruence for subjective (Figure A.17) and objective conditions (Figure A.18).

Figure A.17: Subjective congruence scenarios predicting anti-immigrant attitudes



Note: Marginal effects and predicted values with 95% c.i. of interaction between treatment, household income (poor = 20% percentile, rich = 80% percentile) and region GDP.

Figure A.18: Objective congruence scenarios predicting anti-immigrant attitudes



Note: Marginal effects and predicted values with 95% c.i. of interaction between treatment, household income (poor = 20% percentile, rich = 80% percentile) and region GDP.

I. Appendix: Misperceptions

Figure A.19: Objective vs subjective measures

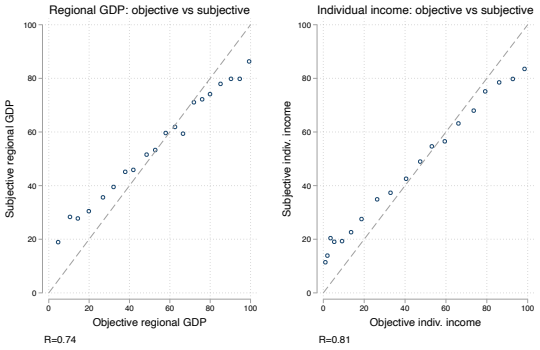


Figure A.20: Objective vs subjective income by regional GDP (median split)

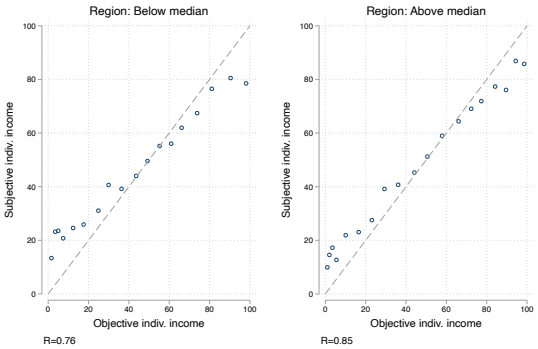


Figure A.21: Distribution of misperception bias (objective - subjective)

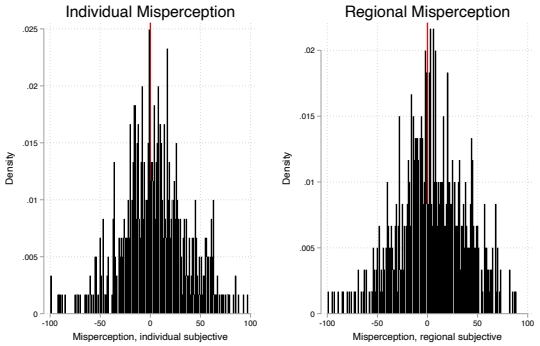
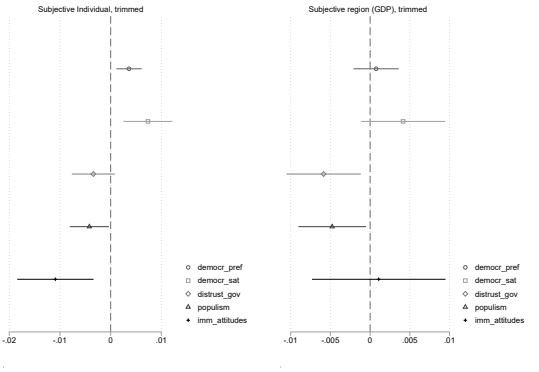
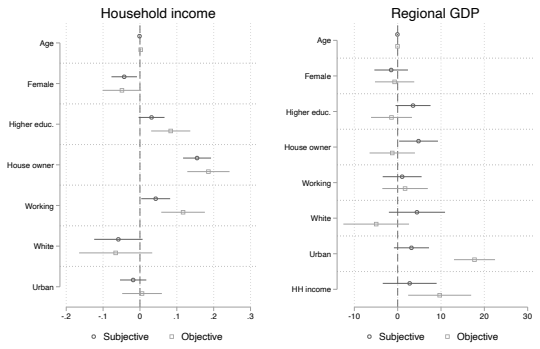


Figure A.22: Trimming the sample



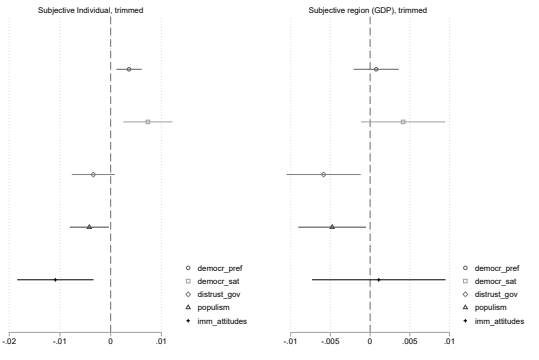
Note: Estimated coefficients (95% confidence intervals), individuals with misperceptions smaller than 15 percentiles. N=593

Figure A.23: Individual characteristics



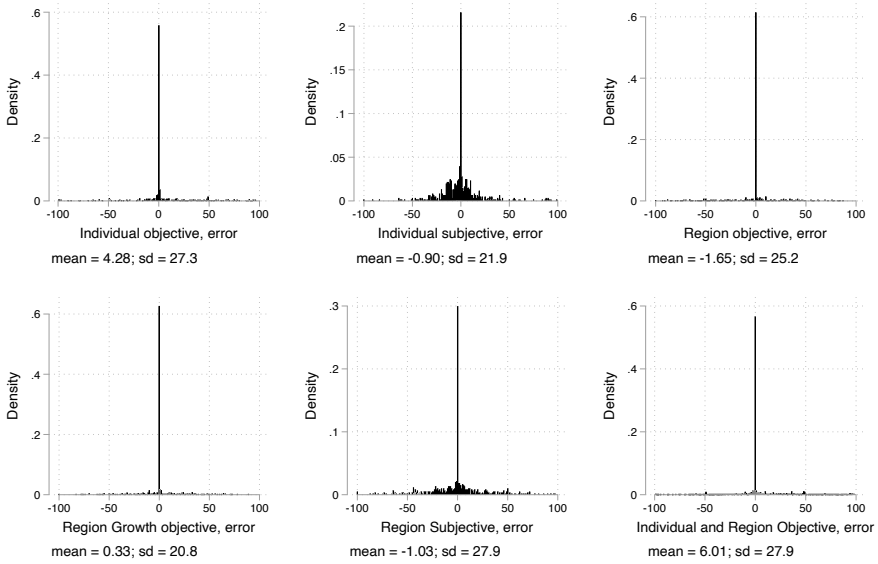
Note: Estimated coefficients (95% confidence intervals). Treatment groups 2 (subjective income; N=590) and 5 (subjective region; N=593).

Figure A.24: Local macroeconomic context



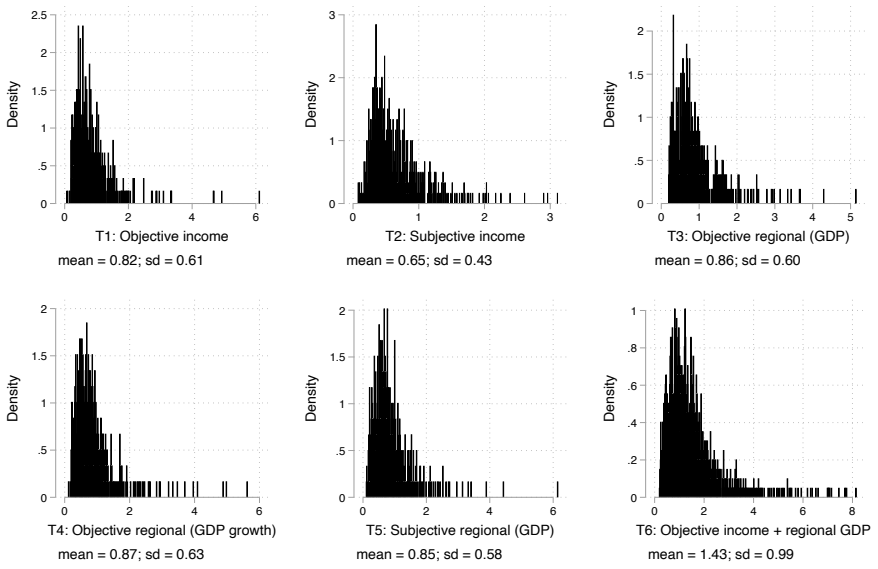
Note: Estimated coefficients (95% confidence intervals), standard errors clustered by local authority. Treatment group 5 (subjective region). N=593

Figure A.25: Manipulation check: Distribution of the error



Note: The error is the difference between the true value (individual income position in T1) as shown in the treatment and the response to the manipulation question in which respondents were asked about the percentage of people earning more than them.

Figure A.26: Time spent on treatment



Note: The graphs exclude the top 1% outliers.

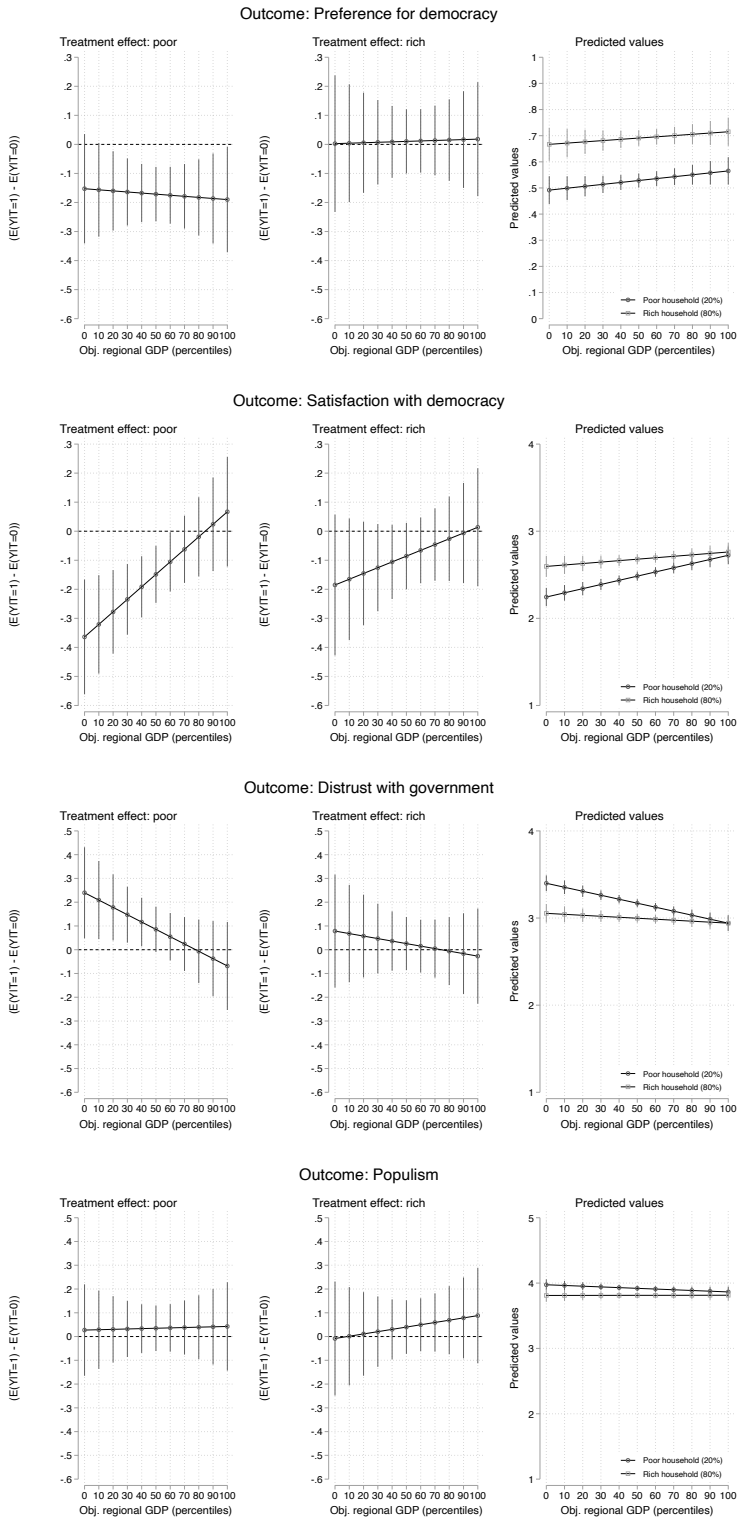
J. Appendix: Additional results cross-over treatments

Table A.12: Results: Subjective income x region cross-over treatment

Outcome	Democr. pref.	Democ. sat.	Gov. distrust	Populism
Treatment group	-0.260*	-0.431*	0.395*	0.040
	[0.11]	0.208	0.176	[0.15]
Subjective HH income	0.000	0.000	0.002	0.000
	[0.00]	0.002	0.002	[0.00]
Reatment x Subj. Income	0.000	0.003	-0.006*	0.000
	[0.00]	0.004	0.003	[0.00]
Subjective local GDP	0.000	-0.001	0.001	0.000
	[0.00]	0.002	0.002	[0.00]
Treatment x Subj. Region	0.00*	0.006	-0.003	0.000
	[0.00]	0.004	0.003	[0.00]
Subj income x subj. Region	0.000	0.000	0.000	0.000
	[0.00]	0.000	0.000	[0.00]
Treatment x subj. income x subj. region	-0.00*	0.000	0.000	0.000
	[0.00]	0.000	0.000	[0.00]
Constant	0.49**	2.515	3.119	3.73**
	[0.06]	0.104	0.093	[0.08]
Observations	2,000	1,882	1,950	1,994
R^2	0.032	0.012	0.020	0.005

Significance levels: ** $p < 0.01$; * $p < 0.05$.

Figure A.27: Objective congruence scenarios predicting outcomes



Note: Marginal effects and predicted values with 95% c.i. of interaction between treatment, household income (poor = 20% percentile, rich = 80% percentile) and region GDP on political resentment.

K. Appendix: Main effects mediation analyses

Table A.13: Effect of subjective regional treatment on mediator among the poor (bottom 20%)

	Poor local authorities (bottom 50%)			
	Democratic preferences sample	**Democratic satisfaction sample**	**Distrust government sample**	**Populism sample**
Adverse economic prospects	0.42**	0.43**	0.39*	0.42**
	(0.15)	(0.16)	(0.15)	(0.15)
N	230	206	224	230
Unemployment prospects	-0.08	-0.04	-0.08	-0.08
	(0.17)	(0.18)	(0.17)	(0.17)
N	146	136	145	146
Interpersonal trust	-0.52	-0.54	-0.48	-0.52
	(0.36)	(0.39)	(0.37)	(0.36)
Social status	-0.92**	-0.91**	-0.9**	-0.92**
	(0.32)	(0.35)	(0.32)	(0.32)
N	216	198	211	216
	Rich local authorities (top 50%)			
	Democratic preferences sample	**Democratic satisfaction sample**	**Distrust government sample**	**Populism sample**
Adverse economic prospects	-0.06	-0.05	-0.06	-0.12
	(0.02)	(0.21)	(0.21)	(0.20)
N	154	142	148	152
Unemployment prospects	0.06	0.06	0.06	0.10
	(0.25)	(0.25)	(0.26)	(0.25)
N	113	108	109	112
Interpersonal trust	0.70	-0.49	-0.64	-0.56
	(0.48)	(0.49)	(0.48)	(0.48)
N	151	142	147	150
Social status	-1.35**	-1.26**	-1.45***	-1.20**
	(0.41)	(0.42)	(0.42)	(0.41)
N	144	136	139	143

Significance levels: *** p< 0.001, ** p< 0.01, * p< 0.05. *Note*: Entries correspond to the linear effect of the treatment on each mediator (rows) using the sample with valid observations on each outcome (columns). All models included pre-treatment controls (gender, age, and education). Standard errors between brackets.