The Cultural Trust Gap: Discrimination Across England's North-South Divide

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June 9, 2026

Trust, the belief in another individual or organisation's intent to act in good faith, is a cornerstone of social prosperity. However, cultural norms significantly influence trust levels within and between groups, often leading to discriminatory behaviours that undermine cooperation. This paper investigates the impact of culture on trust using a novel experimental approach that isolates trust from confounding factors such as risk preferences and distributional concerns. The setting of the experiment is England, a culturally and economically divided nation. Focusing on self-identified Southerners and Northerners, I find evidence of a cultural trust gap. Specifically, while Southerners exhibit equal trust towards both groups, Northerners trust Southerners significantly less than their own group. By decomposing trust into its conditional and unconditional components, I show that this disparity is driven by unconditional trust: Northerners perceive Southerners as more selfish than their own culture.

Keywords: Trust, Culture, Beliefs, Spectator Design
JEL: C90, D01, D83, D91, R11

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I am extremely grateful to Erik Ø. Sørensen for invaluable guidance and supervision for this project. Additionally, I would like to thank Argun Hild, Ankush Asri, Malte Baader, Scott Dickinson, Michael Hilweg-Waldeck, Anna Hochleitner, Jonas Kaiser, Erika Povea and Heidi Thysen for helpful comments. This project was financially supported by the Research Council of Norway (grant 262675). Pre-registration of the data collection and analysis is available at AEARCTR-0014660 (https://doi.org/10.1257/rct.14660-1.1.)

1 Introduction

Trust is a cornerstone of social life and a key determinant of cultural and economic success (Arrow, 1972; Algan and Cahuc, 2010, 2013). However, trust levels vary significantly both between and within regions; it has been shown that economic prosperity is a key driver of this variation (Knack and Keefer, 1997; Putnam, 2000; Algan and Cahuc, 2014). Consequently, the conditions which sustain societal trust are often those that are reinforced by such (Fukuyama, 1995; Heinemann and Tanz, 2008; Algan and Cahuc, 2013). This makes trust a central concern when implementing growth policies: the regions for which growth-oriented policies are most needed are often precisely those where low trust creates friction in the engagement required to implement them.

Accordingly, much scholarship has been devoted to understanding the determinants of trust deficits. Three explanations have received significant attention. First, formal institutions play an important role in governing interactions and influencing preferences and beliefs (Bohnet and Baytelman, 2007). Such structures establish behavioural rules, defining rewards for compliance and penalties for violations. Stronger and more credible enforcement mechanisms foster trust by reducing uncertainty and encouraging innovation and investment through improved relationships (Banfield and Banfield, 1958; North, 1990; Bigoni et al., 2016). Second, socioeconomic factors such as education, income and exposure to social learning influence trust (Knack and Keefer, 1997; Kocher et al., 2012; Thöni et al., 2012). Beyond the absolute levels of these factors, inequality within a society undermines trust by creating perceptions of unfairness and instability (D'Amato et al., 2022; Albertazzi et al., 2025). Third, culture shapes intrinsic beliefs and preferences towards trust (Guiso et al., 2006, 2008; Alesina and Giuliano, 2015). Camerer (2003) describes culture as having the "most significant and robust effects on social preferences". However, it remains challenging to both measure and test the effect of culture on trust (Gächter et al., 2010; Chuah et al., 2016).

In this paper, I contribute to this effort in examining the role of culture in shaping trust levels within and between two closely situated but economically and socially distinct cultural groups. To do so, I define trust as the belief in the trustworthiness of another individual (Falk et al., 2018; Engelmann et al., 2023). With this definition, I employ a modified trust game to identify the effect of culture on trust (Berg et al., 1995).

Recent debate has focused on whether using behaviour in the canonical trust game as a proxy for trust is a reliable measure.[1] As a menu of preferences such as risk and distributional concerns may influence the trusting decision in this game, the mapping of trust beliefs to the trusting behaviour of interest may vary between cultures (Bohnet and Baytelman, 2007; Cox, 2004; Sapienza et al., 2013; Engelmann et al., 2023; Dhami et al., 2024). A commonly employed remedy to this identification challenge is a regression-based methodology wherein a researcher measures a bank of other confounding preferences for each individual and controls for such in the final hypotheses tests.[2] However, this approach has received criticism due to the risk of compounding measurement errors and omitted variable bias (Gillen et al., 2019; Polipciuc, 2022; Engelmann et al., 2023). Alarmingly, in examining the effect of culture, this confounding may be more problematic if the set of values prescribed vary through time and generations.

In response to this argument, I adopt a static definition of culture as a set of social norms and values possessed by a society, conditional on its institutions and socioeconomic conditions

[1] In the standard trust game, two players (A, the trustor, and B, the trustee) interact sequentially. Player A is first given some wealth and must decide how much of this to *transfer* to player B. Before receiving this transfer, the experimenter multiplies the amount by some factor K. Finally, player B must decide how much of this multiplied transfer to return to player A.

[2] This method has been used in, for example, Eckel and Wilson (2004); Karlan (2005); Schechter (2007); Houser et al. (2010); Chetty et al. (2021); Dhami et al. (2024).

(Acemoglu and Robinson, 2025).[3] To identify my effect of interest with these definitions, I employ a novel non-parametric design-based approach to shut down the influence of potentially culturally varying preferences in the measurement of trust. With this, I can identify cultural variations in beliefs residually after accounting for sociopolitical factors.

The setting of the experiment is England, the largest of the four constituent countries which make up the United Kingdom. Within this country, the North and the South have developed into distinct cultures developing their own set of values, beliefs and preferences which transgress many sociopolitical interactions (Wales, 2006). The identities corresponding to these cultural regions are also highly salient due to the impressive diversity of recognisable linguistic dialects across the country (Wales, 2000; Hughes et al., 2013). An advantage of this setting is that the scope through which institutions may play a role is minimised since England is one of the most fiscally centralised countries in the OECD (Raikes et al., 2019). Furthermore, this cultural and socioeconomic division is deeply rooted in political discourse regarding policies which can level out the economic opportunities across the country.

My experiment consists of two parts. First, I recruit a small sample of participants who were born in and live in England to play a trust and dictator game. These games are played anonymously and decisions are elicited using a strategy method (Selten, 1967). Second, a larger sample of participants act as third-party spectators who are incentivised to guess the distribution of decisions made among 10 pairs from the first part. In doing so, subjects elicit their beliefs of the trustworthiness of trustees; this belief is my operational definition of trust. Importantly, this belief elicitation is incentivised such that risk pooling is not an optimal strategy and neither are individuals motivated to act with concerns for wealth distribution. All spectators are told that the participants in the first stage were born in and live in England. With this information alone, spectators are incentivised to elicit their *general trust* – a metric that is strongly linked to economic growth and often measured using surveys such as the World Values Survey (Knack and Keefer, 1997). In two additional treatments, I informed spectators that the trustees in the 10 pairs belonged to either their in-group or out-group.

I find that both cultural identities exhibit similar levels of general trust. However, Northerners, but not Southerners, exhibit discriminative trust: they use the cultural identity of the trustee as a signal of their trustworthiness. Specifically, Northerners demonstrate an out-group bias in that they believe Southerners are less trustworthy than Northerners and the general group. The difference between views of Northerners and Southerners also cannot be explained by education, age, gender, household income or family structure. This result has important ramifications for policy work in bridging the North-South divide: recent debates have been focused on increased inter-regional interactions, a policy which may be ineffective if Northerners are reluctant to engage in trusting activities with their Southern counterparts.

After identifying trust differences, I employ the framework of Ashraf et al. (2006) to decompose trust into its conditional and unconditional components. These authors argue that trust constitutes an expectation of reciprocity and one of selfishness or generosity. In other words, a lender believes that a loanee will repay a borrowed amount if they believe (i) the loanee wishes to repay the lenders kind act, and/or (ii) the loanee wishes to share some of their gains with others regardless of the initial stage actions. I control for beliefs of reciprocity by measuring the expected marginal return to an increased transfer from the trustor, and beliefs of unconditional generosity through beliefs of transfers in a one-shot dictator game in which the trustee plays as the dictator.

Like Ashraf et al. (2006), I find that both the beliefs of reciprocity and of generosity jointly

[3]This definition is not in competition with that of Guiso et al. (2006) which has previously been applied frequently. I complement this definition by assuming that culture is static in time and thus cross-sectional analysis can be conducted using self-identification without the need to measure heritage. For a full review of the literature on defining trust, see Alesina and Giuliano (2015).

determine trust beliefs. However, subjects believe in negative reciprocity: the more that is transferred, the lower the share of the receipt amount is expected to be returned. Expectations of kindness, on the other hand, significantly increase expectations of trustee returns and is the only belief that affects the estimated discriminative trust coefficient. Thus, it appears that Northerners trust Southerners less because they believe that Southerners are more selfish.

This paper makes two important contributions. First, I contribute to the large literature on intra- and inter-cultural studies on trust by studying an under-researched cultural dynamic: that of regions. Studies in this literature have mostly followed one of two approaches. One is to study a small number of cultures to estimate a large cultural effect such as between the US and China (Butler et al., 2015) or the US, Austria, and Japan (Kocher et al., 2008). The second approach is to compare large samples of many cultures to map cultural patterns (for example see Chuah et al. (2016)). A small number of studies have been motivated from a policy-relevant perspective looking into closely located cultures such as Willinger et al. (2003) who study trust differences between border regions of France and Germany; Bigoni et al. (2016) who study cooperation difference between the North and South of Italy; Gupta et al. (2018) and Dhami et al. (2024) who both study ethnic and religious differences in neighbouring regions of India; and Mantilla et al. (2021) who study ethnic groups in China.

The foundational studies of Fershtman and Gneezy (2001) and Fershtman et al. (2005) identify the notion of discriminative trust between cultures. These papers focus on two ethnic Jewish groups living side-by-side in Israel and find that the ethnicity of the trustor and trustee provoke statistical discrimination in trust decisions. I apply this framework to the setting in England which has experienced significant regional division and heated policy debates regarding this divide. In using England as my setting, I study a more divided setting in which the two cultures do not live in a single geography, but are spatially separated under a single institutional setting. This has the advantage that contact, at least that which occurs frequently, is minimised, to study cultural variation in a more isolated space.

The second contribution is to the literature on the instrument through which trust is measured. Sapienza et al. (2013) note that trusting behaviour is not only driven by trusting beliefs, and therefore using the trust game as a measure of trust requires preferences to play a realistic role. This argument is particularly difficult to satisfy using pseudo-anonymised inter-group interactions, where the set of appropriate preferences which should be captured is still up for debate (Engelmann et al., 2023). To compare levels of trust between and towards cultures, I employ a novel methodology that isolates trusting beliefs from often potentially confounding factors such as risk preferences (Eckel and Wilson, 2004; Schechter, 2007; Houser et al., 2010; Blanco et al., 2014; Chetty et al., 2021), distributional concerns (Cox, 2004; Fehr, 2009; Brülhart and Usunier, 2012; Dhami et al., 2024), and an aversion to being cheated or betrayed (Bohnet and Zeckhauser, 2004).[4] My mechanism uses a non-parametric design-based procedure which does not rely on assumptions of the utility function or accurate measurement of other characteristics.

The paper continues as follows. In section 2, I describe the setting of England, discussing the historical context of the North-South divide and providing evidence for the cultural division between the regions. In section 3, I motivate the modifications I make to the canonical trust game and describe the employed experimental procedure. In section 4, I present the experimental results. I discuss these results in light of the existing academic literature and political debate in section 5 and conclude in section 6.

[4]The evidence on how these preferences influence trust decisions is mixed. For instance, while Eckel and Wilson (2004) and Houser et al. (2010) do not find evidence that risk influences trust, Schechter (2007), Chetty et al. (2021) and Engelmann et al. (2023) do so.

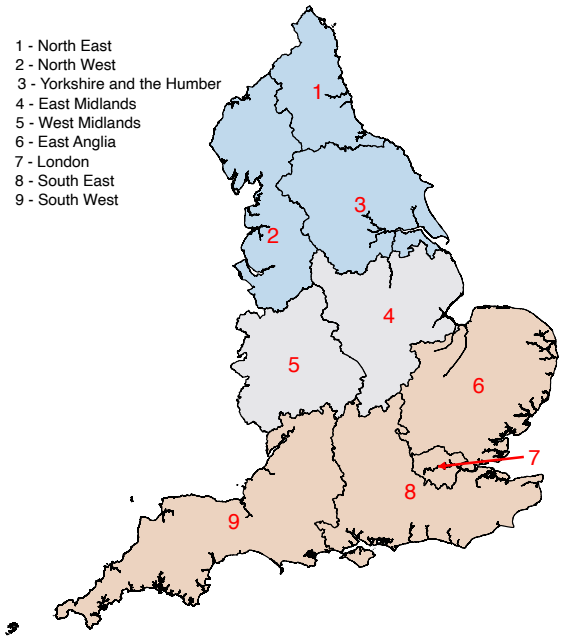


Figure 1: Sub-national regions and groupings of England

Note: Regions 1-3 constitute the North, 4 and 5 are the Midlands, and 6-9 are the South.

2 Setting

The setting for this study is England, the largest of the four constituent countries that make up the United Kingdom (the others being Northern Ireland, Scotland and Wales), accounting for 84% of its population, 53% of the land area and 86% of the gross domestic product (Office for National Statistics, 2023). England is partitioned into 9 sub-national regions which are commonly grouped into the North, South and Midlands as displayed in Figure 1. These regions and groupings are for administrative purposes only and do not represent any subnational devolved responsibilities, that is reserved for the county, city, and parish level.

The area that is referred to administratively as the North has suffered from relative underdevelopment since the Roman conquest of Britain began in 43 CE, during which Northern settlements were seen as less prestigious, potentially due to their proximity to the Celtic settlement in Scotland, distance from Rome and lower perceived resource value. This led to an internal revolt in the Roman conquest which consequentially split the British settlement into Britannica Superior (the South) and Britannica Inferior (the North) (Jewell, 1994). The following Anglo-Saxon invasion further split the land into several kingdoms which inherited different cultural and linguistic influences. This contrast was aggravated by the arrival of the Vikings which was particularly concentrated in the North and brought about Danelaw, a legal and cultural boundary. The Norman Conquest in 1066 and subsequent Harrying of the North (1069-70) devastated Northern England resulting in long-term economic and demographic consequences that stunted the region's recovery for centuries (Wales, 2000).

The Industrial Revolution in the 18th Century marked a pivotal shift in this dynamic. Northern cities became centres for heavy industry leading to significant urbanisation and relative prosperity. However, due the reliance on a few key industries, deindustrialisation of England in the 20th Century led to severe economic decline, high unemployment and social inequality in the North; while the South benefitted from the growth of the service sector (Jewell, 1994; Weinberg et al., 2024).

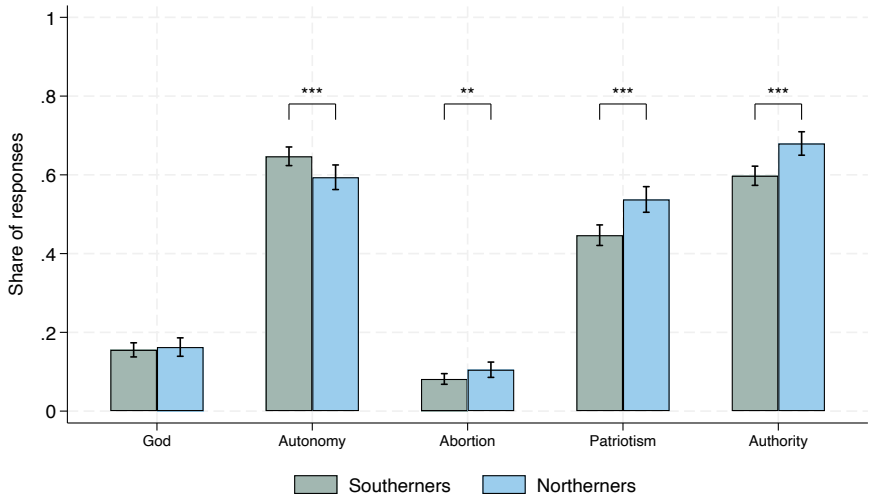


Figure 2: Average level of traditional-secular index values by cultural region.

Responses from individuals who were born in the United Kingdom living in either Northern or Southern ITL1 regions. Northern regions are North East, North West and Yorkshire & the Humber. Southern regions are East Anglia, London, South East and South West. God: Religion is important in life. Autonomy: Child should learn obedience/faith over independence/determination. Abortion: Abortion is never justifiable. Patriotism: Participant is very proud of nationality. Authority: Favours greater respect for authority. 95% confidence intervals displayed. Stars show significance of two-sided t-test difference of means * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Data source: European Values Study and World Values Survey (2022)

Successive governments have attempted to bridge this gap through policies aimed at economic convergence. Most recently, this objective has been referred to as the *levelling up* of the North, including large-scale infrastructure and tax incentives designed to foster intra- and inter-regional interaction (Weinberg et al., 2024). It has been argued that this effort is stymied by the highly centralised structure of governance in England: the UK (and, by de facto, England) is the most centralised large developed country in the world (Raikes et al., 2019).[5] While this creates fiscal barriers to regional investment, it also establishes a homogeneous institutional landscape.

In parallel to the economic, social and political differences, the North and the South are demarcated by a stark cultural divide. Sociologists have argued that *Northernness*, as a distinct culture, is as much a Northern polar construct of *Southernness* and the power attributed to the South, as it is a reality (Wales, 2006; Spracklen, 2018). In this sense, the North is positioned as the *other* culture in English discourse compared to the historically aristocratic and individualistic *normal* Southern culture (Russell, 2004). The marginalisation of Northern culture is deeply rooted in the historical deprivation of the region from the Roman outposts to the working-class and industrial heritage. This is in stark contrast to the relatively favoured metropolitan South. Accordingly, many of the notable cultural aspects of the North developed in tandem with history, for instance the direct Northern dialect is derived from old Norse which arrived with the Vikings (Ehland, 2007).

Grounded in Northern culture is therefore the essentialist desire to contrast to the Southern identity. This manifests clearly in a stronger sense of regional and national pride as observed in the World Value Survey and European Value Survey (2022). I use this survey to identify those that live in Northern and Southern regions and compare responses to culturally related questions. Fig-

[5] As measured according to an index of sub-national tax burden and spending as a percentage of total tax burden and GDP.

ure 2 demonstrates that Northerners are less likely to agree that children should learn obedience and faith over independence and determination, and more likely to agree that abortion is never justified and that individuals should have a greater respect for authority. Responses to these questions correspond to the traditional-secular definition of culture from Inglehart and Welzel (2005). Using this tool and the corresponding weightings, I reject the null hypothesis that Northerners and Southerners are equally traditional/secular (Wilcoxon rank-sum $z = -3.606$, $p < 0.001$) and find that only in their religiosity do Northerners and Southerners appear similar in the survey.

Using survey evidence, Richards and Heath (2023) find cultural distance between Southerners and Northerners through a demonstrated in-group bias from responses to whether subjects believe individuals from each group are likely to share their own values. This bias is much stronger amongst Northerners than among Southerners.

The survey evidence on trust in this setting is scant. The aforementioned World Value Survey and European Value Survey (2022) asks individuals to what extent they agree that most people can generally be trusted. While I cannot identify cultural identity beyond using the location of the interview, those in Northern regions are 8.9 percentage points less likely to agree with this statement than those in the South.[6] Additionally, as a weak proxy for trust intentions, Richards and Heath (2023) find that both Southerners and Northerners rate Northerners as more 'straightforward and honest' than Southerners.

3 Experiment

To experimentally measure trust, the literature commonly employs variations of the investment game first introduced by Berg et al. (1995), now more often referred to as the trust game (as introduced by Glaeser et al. (2000)). In this game, two players (A, the trustor, and B, the trustee) interact sequentially. Player A is first given some wealth and must decide how much of this to *transfer* to player B. The experimenter multiplies the transfer by some factor K. Finally, player B must decide how much of this multiplied transfer to return to player A.

The standard economic model predicts that, since each individual is only self-interested, player B would never return a non-zero amount and, knowing this, player A would not transfer any of her wealth to her counterpart. Nonetheless, on average, positive amounts are sent by both players. Berg et al. (1995) argues that this result demonstrates that individuals exhibit both trust and trustworthiness in their decision making. However, Cox (2004) and later Chaudhuri and Gangadharan (2007) argue that the decision of player A is not necessarily one solely of trust. It may be that player A is most concerned with the distribution of final wealth and so may be motivated to transfer through altruistic tendencies. Moreover, this decision may be influenced by other desires such as that to avoid inequality or potential betrayal (Bohnet and Zeckhauser, 2004; Hong and Bohnet, 2007), the latter point no doubt compounded through preferences for taking risks (Houser et al., 2010; Chetty et al., 2021).

As the transfer decision by player A captures a plethora of motivations, one may be sceptical to employ the game as an identification of trust beliefs when comparing two cultural groups who may also exhibit heterogeneous levels of such motivations. In response to this, one could measure individual level preferences for equality, risk, and betrayal to control for such in hypothesis testing. However this method requires restricting assumptions on the utility function to form conclusions. Moreover, such an approach requires that researchers accurately measure and sufficiently account for all of the potentially confounding preferences (Gillen et al., 2019; Polipciuc, 2022; Engelmann et al., 2023).

[6]When controlling for age, sex, level of education, income, employment status, immigration status, regional fixed effects and cultural markers as per Inglehart and Welzel (2005).

To mitigate the influence of other preferences on identifying trust, I propose a modification to the canonical trust game in which I directly measure beliefs about trustee returns using an online sample of 912 participants from England who act as third party spectators. This design separates the belief elicitation and the trusting behaviour which is advantageous for four reasons. First, I elicit beliefs of realised outcomes, and so participants can be incentivised for accuracy (Chapman et al., 2025; Gächter and Renner, 2010). Second, I mitigate the concern that belief elicitations may influence the decisions through which the beliefs are about (Blanco et al., 2014; Croson, 2000). In other words, there is no concern that the act of eliciting beliefs may distort the behaviour that incentivises the beliefs (Charness et al., 2021). Third, there is also no concern that beliefs may be motivated by self-interest to financially profit through egotistical motivated beliefs (Bénabou, 2015; Charness and Dave, 2017).[7] Finally, this mechanism to elicit beliefs is cheap and highly scalable since it only requires a small set of expensive trust games to be played at high stakes in order to obtain a large number of spectator beliefs.

Design

The study consisted of two experiments. In the first, participants were assigned the role of player A or player B and proceeded to play an anonymous trust game adapted from Glaeser et al. (2000). Player A received an endowment of 3 tokens while player B began with 0 tokens. Any amount sent by player A was tripled. Player B elicited their returns using a strategy elicitation method (Selten, 1967).[8] This meant that player B was required to state how many tokens they would wish to return to player A for each possible amount that they could receive from them (in this case 3, 6 or 9 tokens). Following the trust game, players proceeded to a dictator game in which player B was first endowed with 5 tokens and could then send any number of tokens to player A. To mitigate within-subject correlation and hedging incentives, participants played these games in a random order and were paid for only one of the games chosen at random.

The second experiment recruited a new pool of participants to act as spectators. The spectators were informed of the proceedings of the first experiment and subsequently asked to guess the frequency of each possible outcome among 10 dyads in each decision of each game. To elicit their belief of the discrete distribution, spectators moved a set of sliders corresponding to each possible action in each decision. For instance, in the setting in which spectators had to elicit their beliefs of the distribution of returns for the case where player A transferred 2 tokens and thus player B received 6, spectators would face 7 sliders (for returns of 0 to 6 tokens inclusive). Spectators were told to drag each slider to indicate the number of player Bs (out of 10) who chose to return the specific amount indicated by the slider. The spectator could not move to the next page until the values of all the sliders summed to 10. Figure D.5 displays a screenshot of the sliders.[9] Specta-

[7]For instance, a higher conditional belief would, if true, return a greater pecuniary reward for the participant if they were also playing the trust game themselves. Of course, in group contexts, individuals may be motivated by group-interests to state beliefs that adhere to their identity (Heidhues et al., 2026). However, it is appropriate to capture this mechanism in my belief elicitation as it is potentially culturally driven, particularly if it is likely to affect future behaviour. I discuss this in the section 5.

[8]This strategy method is commonly used in trust games to identify the distribution of trustworthiness and the degree to which individuals are reciprocal (Chaudhuri and Gangadharan, 2007; Barrera and Simpson, 2012; Butler et al., 2015; Hergueux and Jacquemet, 2015; Kocher et al., 2015; Chaudhuri et al., 2016; Batsaikhan, 2017).

[9]Prior to eliciting their beliefs of the decisions in the actual games, spectators had the opportunity to practise using the sliders with a simple incentivised task. Players were informed that there were 4 balls in an opaque bag, each of a different colour. One ball was randomly picked from the bag, the colour was recorded and then the ball was replaced back inside. This was repeated 10 times. Participants then had to guess the frequency at which each colour of ball was picked from the bag among the 10 iterations. Participants

tors were compensated with a cash reward for each distribution they guessed exactly correct thus neutralising any incentive to risk pool.

Treatments

Participants in the second experiment were randomised to a treatment condition which varied the information concerning the identity of player Bs in the 10 pairs for which they had to state their beliefs. Within each treatment condition, all spectators elicited beliefs concerning the same 10 pairs.

All spectators were informed that player As and Bs were born in and live in England and that they knew only this information about their co-player. No further information regarding player A was given ensuring that across all treatments, the information regarding player A and player B's knowledge of player A was kept constant. In the *General* treatment, spectators received no further information regarding the player Bs. The beliefs elicited in this treatment condition are interpreted as general trust of the English populace.[10]

Two other treatment conditions were employed. Participants in the *In-Group* (*Out-Group*) treatment condition were informed that the player Bs in each of the 10 dyads belonged to their in-group (out-group) as defined by their regional identity. Beliefs measured in these treatment conditions are interpreted as specific trust: how much trust one places unto the average person with a specific identifying characteristic. Analysing results between treatments and within each identity produces a causal interpretation of the effect of the cultural identity of a trustee on trust.

Hypotheses

Given that individuals are often required to interact with a diversity of others, often under conditions of uncertainty, researchers commonly examine the level of general trust within a group. For instance, Putnam (2000) argues for the importance of such trust as a *bridging* device to generate broader identities and reciprocity, while de Souza Briggs (2003) claims that bridging capital is essential for "getting ahead" economically, a hypothesis that has received empirical support (see e.g., Algan and Cahuc, 2013). Therefore, I first test for cultural differences in general trust using the following null hypothesis.

Hypothesis 1: Northerners and Southerners exhibit equal general trust.

To establish causal claims on the effect of culture on trust, I next examine the influence of the identity of the trustee on specific trust. To this end, I investigate whether spectators from a specific cultural identity exhibit greater trust towards members of their in-group or their out-group.[11] Such a difference could be interpreted as discriminative trust: individuals rely on the social identity of a trustee for forming trust-related beliefs. Such discrimination has been identified particularly among individuals belonging to minority groups which have experienced oppression or prejudice (Fershtman and Gneezy, 2001; Mantilla et al., 2021). However, this effect may fail to arise in more egalitarian societies (Jensen et al., 2015), or among members of majority groups who experience greater prosperity and lower conflict for resources (Gupta et al., 2018). This suggests that

received a £0.50 bonus if they guessed the distribution of colours which were drawn by a computer.

[10]For incentive purposes, spectator responses in this treatment condition were compared to the outcomes of 10 randomly selected pairs from experiment 1.

[11]While I may study the effect of the cultural identity of the spectator on the trust towards some specific group, such an analysis cannot be interpreted causally. This is because I cannot fully account for unobserved differences between cultural identities among the spectators.

discriminative trust may well be a self- or group-protection norm.

Social inequalities have been well-documented across the North-South division in England (Raikes et al., 2019). However, it is uncertain whether these inequalities manifest as a universally recognised social hierarchy. Consequently, if discriminative trust exists in the North-South context, there is little empirical evidence indicating among which identities it would be detectable.[12] Thus I remain ex-ante agnostic regarding the presence of specific trust.

Hypothesis 2: Northerners and Southerners trust their in-group equally to their out-group.

Socioeconomic status is often cited as a primary driver of increased trust. For instance, individuals with higher levels of education generally exhibit higher levels of trust (Putnam, 2000; Uslaner, 2008). Consequently, when interpreting exhibited trust differences between Northerners and Southerners as a cultural wedge, it is important to ascertain whether this is driven by underlying social inequalities rather than inherent cultural beliefs.

In the context of England, the highly centralised structure of governance minimises regional differences in economic incentives for investments in improving socioeconomics and consequently in trust building activities. Therefore, I argue that while the absolute levels of socioeconomic factors measured in the experiment can act as controls across regions, they may not explain cultural differences in trust in this context.

Hypothesis 3: The difference in trust between Northerners and Southerners is not explained by socioeconomic factors.

Trust involves two dimensions: the expectation of reciprocity and the expectation of generosity. One's expectation of player B's return amount is a composite of one's belief of how the player will reward (punish) the transfer and of one's belief of their generosity. The latter represents one's belief of how much player B would return should they be unaware of the origin of the transfer. This dichotomy presents an inherent trade-off in the trust game: a trustor wants to maximise her payoff by transferring enough such that she is rewarded by the trustee's reciprocity, but not too much such that the believed selfishness of the trustee works against her objective (Dhami et al., 2024).

This decomposition was stylised by Ashraf et al. (2006) who describe trust as expectations of conditional and unconditional trustworthiness. They find that trust is driven by both of these expectations simultaneously using the expected reward to increased transfers as a proxy for beliefs of reciprocity and the expected transfer in a dictator game as the belief of generosity. I can capture both of these in my experimental set-up and use their findings to formulate the following hypothesis.[13]

Hypothesis 4: Trust differences are caused by differential beliefs in reciprocity and generosity.

[12]The results of Richards and Heath (2023) suggest that Northerners, at least, exhibit in-group biased beliefs regarding the straightforwardness and honesty of others. However, such beliefs may be inflated by ego-related motivations: one may accrue group-related utility from stating the belief that one's own group excels in trustworthiness, a trait generally regarded as virtuous. Thus, it may be that this result reflects taste-based discrimination, an effect that is mitigated in my incentivised spectator methodology.

[13]Hypothesis 4 was not pre-registered and so should be interpreted as exploratory.

Procedure

The experiments were coded using oTree (Chen et al., 2016) and conducted on Prolific in November 2024. The full experimental instructions are available in Appendix C. To be eligible for either experiment, participants had to be born in and currently residing in England. Participants were first classified as either *Northern*, *Southern* or *Other* using a survey. Classification as Northern (Southern) required the participant to self-identify as a Northerner (Southerner), be born in and currently living in the North (South).[14] Participants who did not meet these criteria, such as those residing in the Midlands, were classified as *Other*.[15]

For experiment 1, I employed a targeted recruitment strategy to form two pools. Pool A contained 30 participants of any regional classification to play as player A and Pool B contained 29 participants who played as player B of whom at least 10 participant were classified as Southern and Northern. This strategy did not skew the representativeness of the sample in an unrealistic direction since Southern and Northern classifications account for 53% and 28% of England's population respectively.[16] Participants received a £1.00 show-up fee. After completing the experiment, the participants were matched to another in the other pool for the computation of bonus payments. Participants played both the trust and dictator game with the same matching and received a bonus equal to their earnings from one of these games chosen independently at random. Each token carried a cash value of £2.00 and the average earnings was £6.73.

Experiment 2 recruited 912 new participants who were classified as either Northern or Southern. Participants had to answer a set of questions demonstrating their understanding of the trust and dictator game as well as the sliders before they could elicit their beliefs. They were incentivised to guess their accurate beliefs by the offer to receive a cash bonus for each distribution guessed correctly. These cash bonuses ranged from £1.00 to £2.50 per distribution according to the number of integers available in the distribution. Participants in experiment 2 received a £1.30 show-up fee and average earnings were £1.37.

The sample in experiment 2 consisted of 503 Southerners and 409 Northerners. Their socioeconomics are detailed in Table A.1. On average, Northerners in my sample are slightly older than Southerners (average age 32.8 years vs 31.1 years), however my sample is substantially younger than the true population. Moreover, the share of females is greater in my Southern sample than the Northern counterpart.[17]

Participants had to state their beliefs of the outcomes of the trust and dictator game in a random order. I use the chi-squared test to test the hypothesis that the distribution of results is equal for the two orderings. I reject this hypothesis ($p < 0.001$) and so proceed to include the ordering of games as a control in all regressions. I report results for each ordering separately in Appendix A.

[14] Following from Richards and Heath (2023), I define the geographical North of England as comprising the regions of the North East, North West and Yorkshire and the Humber. The geographical South contained London, East Anglia, South East and the South West.

[15] Notably, contained in this category are individuals who have moved to the other cultural region to where they were born. On the one hand, this limits concerns of endogeneity through self-selected exposure to the out-group. To control further for this, I ask participants if, between birth and the experiment, if they had temporarily lived in the other cultural region. I include robustness tests for all hypotheses accounting for these individuals in Appendix A. On the other hand, one may argue that not moving to the other region is equally as endogenous as I would be recruiting individuals who would exhibit the highest levels of in-group favouritism. However, one may conjecture that not engaging in inter-regional moving is a default behaviour for many and so this may be the least endogenous and thus restricting group to include in my sample.

[16] I planned to recruit 30 participants to Pool B but due to a technical error, only 29 were admitted. One player B was therefore unknowingly matched to two player As. One of these player As was randomly chosen to determine the bonus payment for this player B.

[17] Prolific (2025) demonstrates that their samples are often skewed towards young female and highly educated individuals. This is a well known bias using this platform.

4 Results

I organise my analysis as follows. First, I compare the beliefs of Northerners and Southerners regarding the trustworthiness of a general English populace. Next, I analyse the trust beliefs of spectators with respect to their in-group and out-group to identify the presence of discriminative trust. Third, I present beliefs of dictator giving by trustees and finally incorporate this into the analysis of trust beliefs to identify the degree to which effects are driven by beliefs of generosity.[18]

In reporting these results, I adopt an econometric specification that facilitates interpretation. Specifically, my data is structured such that I collect the subjective distribution of returns of trustees conditional on receiving 3, 6 or 9 tokens (when the trustor transfers 1, 2 or 3 tokens). I relegate an analysis of the full distributions to Appendix B and focus in this section on the conditional expectations of such distributions. I refer to the hypothetical number of tokens sent (received) by player A (B) in the trust game as the transfer (receipt) value, $t \in \{1, 2, 3\}$ ($r \in \{3, 6, 9\}$). Finally, to ensure comparability, I divide each conditional expectation by the receipt value to compute y_{ij}, the expected share of return for spectator i regarding and trustee of group $j \in \{G, I, O\}$ where G is the general treatment, I is the in-group treatment, and O is the out-group treatment.

My chosen model is linear. Given that there are 3 dependent variables for each participant: for each hypothetical receipt amount, I control for the corresponding receipt values and cluster the standard errors at the participant level. Thus, my specifications effectively average the conditional expectations of shares returned by trustees over each hypothetical belief distribution to compute the effect of culture on trust.

General Trust

Across each hypothetical receipt amount, Northerners and Southerners do not hold distinguishable beliefs about the conditional returns of general trustees. The exception is the case in which trustees receive 9 tokens, where Northerners believe the conditional return share is marginally less than that of Southerners (Welch two-sided t-test $p = 0.077$).[19] Figure 3 (i) presents these conditional expectations demonstrating that as the receipt amount increases, spectators believe that the average return share decreases.[20] This can be interpreted as contradictory evidence for beliefs in reciprocity: spectators do not believe that higher amounts sent lead to greater returns from the trustee (Ashraf et al., 2006).

However, Figure 3 (ii) shows that this does not mean that spectators believe that there is a lower average marginal return to transfers. In fact, as the receipt values increase, both Northerners and Southerners perceive a higher probability of profiting from the interaction. There is no significant difference in the belief of profit between the two identities in the general treatment. Across all receipt values, less than 35% of spectators believe that they are more likely to profit than not in the

[18] For brevity and interpretation, the presentation of results does not follow the exact procedure pre-specified. For a full presentation of results according to the pre-analysis plan, see Appendix B. Using either procedure, my results and conclusions remain the same.

[19] I employ Welch's t-test adjustments in reporting results to account for unequal variances and sample sizes.

[20] The belief distributions presented in Figure B.1 in Appendix B provide further evidence or this result. While I can reject the null hypothesis that the belief distributions are identical in the instances of receipt amounts of 6 and 9 tokens (chi-squared test p-value =0.017 and =0.002 respectively), the distributions do not exhibit any unambiguous stochastic dominance.

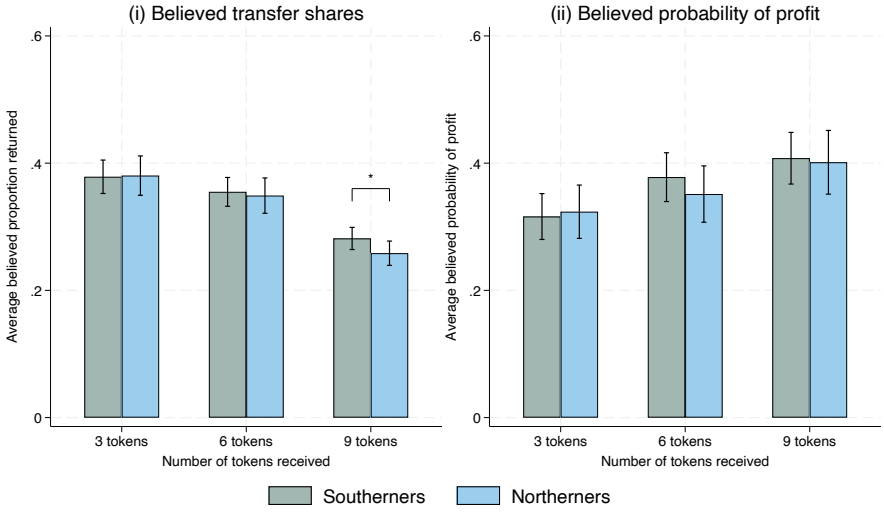


Figure 3: Beliefs of (i) average share of receipt returned, and (ii) probability of profiting from return in General treatment

Note: Southerners and Northerners refer to the identity of the spectator. Belief of profitability is computed as the share of trustees who spectator believe return more than initial transfer. 95% confidence intervals shown. Stars show significance of two-sided t-test difference of means using Welch's approximation unequal variances between groups * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

trust game.[21] Thus, one would expect low transfer amounts if the game was to be played.[22]

To estimate the effect of the spectator's identity on general trust, I estimate an econometric specification of the following form,

$$y_{ij} = \alpha + \beta_1 \mathbf{1}(r = 6) + \beta_2 \mathbf{1}(r = 9) + \delta N_i + \gamma Z_i + \epsilon_i \tag{1}$$

where N_i is equal to 1 if the spectator i is Northern and 0 if they are Southern, Z_i is a vector of individual socioeconomic controls, and ϵ_i is the standard error term clustered at the individual level. The coefficient δ is the average marginal effect of the spectator being a Northerner on general trust beliefs.[23] As is shown in Table 1, the estimation of this coefficient is not statistically significant ($p = 0.599$) and this remains the case when controls for age, gender, education and income are included ($p = 0.385$).[24] With this evidence, I cannot reject hypothesis 1.

[21] 17.9% (18.4%) of Southerners (Northerners) believe that they are most likely to profit if they were to play the game with a general trustee and transfer 1 token. These figures stand at 25% (25.2%) and 33.3% (34.7%) in the case of transferring 2 and 3 tokens.

[22] On average, Southern (Northern) spectators in the general treatment believe that trustors sent 1.210 (1.252) tokens to the trustee. This reflects a belief in relative conservatism as this is below the average share sent of 50% of the endowment as shown in the meta-analysis of Johnson and Mislin (2011).

[23] I estimate separate linear regressions for each receipt value and present results in Table B.1. The estimated Northern coefficient is only significant in the case of 9 token receipts (with controls $p = 0.033$). I interpret this result cautiously due to the increased noise in the elicitation. Since this effect is not identified in more simple elicitation methods, I remain conservative and stand by the negligible cultural difference identified in the main specification.

[24] This result is robust to the inclusion of controls for intra-regional moving: individuals who moved to other regions within the same cultural zone (see Table A.2 column 1). An additional robustness test estimates the specification separately for each order of procedure (trust game first or dictator game first) and the null result remains (see Table A.2 columns 2 and 3).

Table 1: General trust of Northerners and Southerners

Dependent Variable:	Share of received tokens believed to be returned	
	(1)	(2)
Northern	-0.007	-0.012
	(0.013)	(0.014)
Socioeconomic controls		✓
Baseline mean	0.338	0.338
Observations	948	948
Participants	316	316
R^2	0.088	0.108

Notes: OLS regressions of average expectations of trustee returns over each possible receipt. Each specification includes dummy variables for receipt value. Column 2 includes controls for age group bracket, if the participant is female, if the participant attended university, income bracket, and whether the individual has children. All specifications include a control for the ordering of the trust and dictator game. Standard errors clustered on the individual level reported in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Result 1: Northerners and Southerners exhibit equal levels of general trust.

Specific Trust

To analyse specific trust among the two cultural identities, I compare the beliefs of conditional return shares of in-group and out-group trustees.

On average, Southerners believe that Northern (Southern) trustees return 33.9% (33.0%) of their receipt amount to trustors. However, Northerners exhibit discriminative trust: on average, they expect Northern trustees to return 33.9% of their receipt whereas the expected return share from Southern trustees is 30.5%. This average difference is significant at the 1% level (two-sided Welch t-test $p = 0.004$) and is concentrated to different beliefs regarding the share of receipt returned conditional on receiving 3 and 6 tokens as is shown in Figure 4 (i). This difference can be interpreted as an out-group bias: Northerners believe that, on average, Southern trustees return less than the general group (two-sided Welch t-test $p = 0.005$) but their belief of the amount returned by Northern trustees is not significantly different to this reference case (two-sided Welch t-test $p = 0.364$). Southerners, on the other hand do not hold significantly different beliefs of return shares for any receipt values as seen in Figure 4 (ii).[25]

[25] As in the previous section, average beliefs of the probability of profiting does not decrease as receipt amounts increase (see Figure A.1). For both groups of spectators and for each identity of the trustee, the average believed return share declines with the amount of tokens sent suggesting that beliefs of reciprocity are not driving this result.

Within each identity, the believed probability of profiting does not depend on the identity of the trustee. On the other hand, Northerners believe that one is significantly more likely to suffer a loss in the game when playing with Southern trustees than with Northern trustees (see Figure A.2).

The distributional analysis concurs with this result as is shown in Figures B.2 and B.3 in Appendix B. For each possible receipt value, I reject the null that Northerners; believed distribution of returns are equal concerning Northern and Southern trustees (chi-squared test all p-values < 0.001). However, Southerners' believed distribution of returns concerning Northern and Southern trustees are statistically distinguishable (chi-squared test all p-values > 0.05).

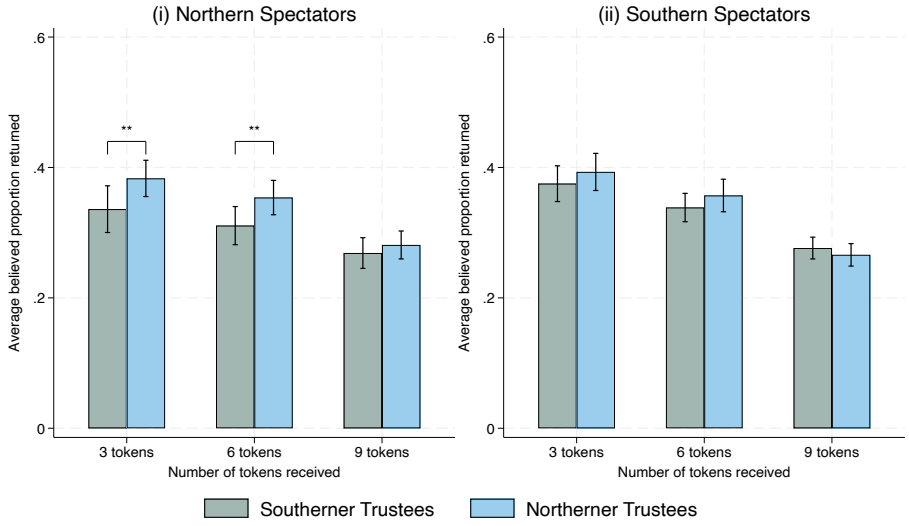


Figure 4: Average believed transfers of trustees in the trust game conditional on receipt amount for (i) Northern and (ii) Southern spectators, by identity of trustee.

Note: Panel (i) shows the average beliefs of Northern spectators for each identity of trustees and panel (ii) for Southern spectators. 95% confidence intervals shown. Stars show significance of two-sided t-test difference of means * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

I construct a linear regression model to test whether beliefs of Southerners and Northerners concerning each group are different, and to what extent the identified discriminative trust depends on socioeconomic levels. Specifically, I estimate specifications for each of the two cultural identities of spectators separately before estimating the full specification of the following form,

$$y_{ij} = \alpha + \beta_1 \mathbf{1}(r = 6) + \beta_2 \mathbf{1}(r = 9) + \delta_1 N_i + \delta_2 O_j + \delta_3 N_i \times O_j + \gamma Z_i + \epsilon_i, \tag{2}$$

where O_j is equal to one if the trustees belong to one's out-group and zero otherwise. δ_2 identifies discriminative trust against the out-group among Southerners while a $\delta_2 + \delta_3$ captures discriminative trust against Southerners present only among Northerners.

From Table 2, when estimating the regression for each spectator identity individually (columns 1-4), the effect of the trustees being from the out-group is only statistically significant for Northerners. In both cases, the inclusion of socioeconomic controls does not affect the estimated coefficients. When pooling both identities together (column 5), Northerners believed share of returns from Northerners is similar to Southerners beliefs of returns made by both identities. Only δ_3 is statistically significant (with controls $p = 0.024$) showing that Northerners perceive that, on average, Southerners return less of their receipt than Northerners. Crucially, from column 6, the inclusion of socioeconomic controls does not explain the difference in beliefs among Northerners regarding their Southern counterparts. To summarise, Northerners of a similar socioeconomic standing believe that their out-group returns 4.5 percentage points less of their receipt than their in-group and than Southerners believe either group does.[26]

[26]These results are robust to the inclusion of controls for moving (see Table A.3 column 1). The direction of the interaction coefficient is the same for both orderings of the procedure, however only significant when participants elicit beliefs of the dictator game first (see Table A.3 columns 2 and 3). This may suggest that Northerners only exhibit discriminatory trust when they are primed to consider the generosity of the trustee. This point is discussed in more detail in the Discussion.

Table 2: Specific trust of Northerners and Southerners

Dependent Variable:	Share of received tokens believed to be returned (mean)					
	Northerners		Southerners		All	
	(1)	(2)	(3)	(4)	(5)	(6)
Out-Group	-0.037**	-0.036**	0.010	0.010	0.011	0.011
	(0.016)	(0.016)	(0.013)	(0.013)	(0.013)	(0.013)
Northern					0.012	0.011
					(0.013)	(0.013)
Northern × Out-Group					-0.047**	-0.045**
					(0.020)	(0.020)
Socioeconomic controls		✓		✓		✓
$\delta_2 + \delta_3$ p-value					0.023	0.029
Baseline mean	0.339	0.339	0.330	0.330	0.330	0.330
Observations	783	783	1005	1005	1788	1788
Participants	261	261	335	335	596	596
R^2	0.081	0.099	0.092	0.119	0.085	0.097

Notes: OLS regressions of average expectations of trustee returns over each possible receipt. Each specification includes dummy variables for receipt value. Even number specifications include controls for age bracket, if the participant is female, if the participant attended university, income bracket, and whether the participant has children. All specifications include a control for the ordering of the trust and dictator game. Baseline mean refers to the average share of tokens believed to be returned by the spectators' in-group (columns 1-4) and by Southern spectators' in-group (columns 5-6). Standard errors clustered on the individual level presented in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Result 2: Northerners, but not Southerners, exhibit discriminative trust: they trust their out-group less than their in-group.
Result 3: Results 1 and 2 hold when controlling for socioeconomic factors.

In Table A.4, I analyse the heterogeneity of this result for a number of sub-groups of the sample. Fershtman and Gneezy (2001) find that only men exhibit discriminatory trust towards ethnic Jewish groups and I find that this also holds in my study (columns 1-2). This may suggest that discriminatory trust is a male trope, although the exact mechanism through which this appears is out of the scope of this paper. Next, I partition my sample into two age groups, those below 40 years in age, and those of 40 years and older (median split according to my instrument of measurement). Columns 3-4 show that δ_3 is only marginally significant among the younger subgroup ($p = 0.058$) but is not significant at all among the older group ($p = 0.108$).[27] Finally, I find that δ_3 is only significant on the subsample who have not attended university (columns 5 and 6).

[27]This is an interesting result as Guiso et al. (2006) propose that trust norms are passed from generation to generation and may abate through sequential interactions that are brokered during mutations of the norm. In my case then, it appears that the discriminatory norm among Northerners is not necessarily inherited and may be a response to contemporaneous shocks in the lifetime; potentially mitigated through years of contact, maturity and resource allocations. I discuss this result further in the following section.

Table 3: Believed transfers in dictator game

Dependent Variable:	Share of tokens believed to be sent (mean)			
Treatment(s)	General		In-Group & Out-Group	
	(1)	(2)	(3)	(4)
Northern	0.013	0.013	0.019	0.016
	(0.020)	(0.021)	(0.020)	(0.020)
Out-group			0.010	0.010
			(0.019)	(0.019)
Northern × Out-group			-0.061**	-0.061**
			(0.029)	(0.029)
Socioeconomic controls		✓		✓
Baseline mean	0.281	0.281	0.293	0.293
Observations	316	316	596	596
R^2	0.001	0.052	0.010	0.056

Notes: Linear regression of expected dictator giving. Specifications (1) and (2) compare the beliefs of spectators about a general population using the General treatment group. Specifications (3) and (4) use In-Group and Out-Group treatment groups to compare beliefs of spectators across cultural groups. Even number specifications include controls for age bracket, female, university education and income bracket. All specifications include control for ordering of the trust and dictator game. Baseline mean refers to the average share of tokens believed to be sent by Southern spectators (columns 1-2) and by Southern spectators' in-group (columns 3-4). Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Beliefs about generosity

In this section, I decompose trust into beliefs of conditional and unconditional trustworthiness where the former represents beliefs of reciprocity and the latter represents beliefs of selfishness or generosity. In other words, beliefs of the distribution of unconditional trustworthiness can be elicited through beliefs of the distribution of transfers made by the trustees playing as a dictator.

I find that Northern and Southern spectators believe that, on average, the general dictators transferred 29.4% and 28.1% respectively of their initial allocation to the receiver. This difference is not statistically significant (two-sided Welch t-test $p = 0.260$). While Southerners do not hold significantly different beliefs about the share sent by Southern and Northern dictators (29.2% vs. 30.3% respectively; two-sided Welch t-test $p = 0.368$), Northerners believe that Southern dictators send less than Northern dictators (26.1% vs. 31.2% respectively; two-sided Welch t-test $p < 0.001$).[28] By comparing Northerners' specific beliefs to those from the general treatment, the expectation that Southern dictators transfer less than both suggests that this belief manifests as an out-group bias (Fershtman et al., 2005). Moreover, Northerners' belief of Southern dictators' average transfer is significantly less than their belief of the general case (two-sided Welch t-test $p = 0.010$) while their belief of Northerners' average transfer is not distinguishable from belief in the general treatment.

To show these results in a regression form, I estimate a series of linear models for the gen-

[28] As expected, this result is also supported by a distributional analysis where only Northerners exhibit belief distributions that demonstrate stochastic dominance (chi-squared test $p < 0.001$) (see Figure B.4).

eral treatment and then the specified treatments (in-group and out-group) separately. The results of these estimations are displayed in Table 3 where the dependent variable is the average share of the 5 tokens that the spectator believes the dictator will send. Northerners and Southerners do not hold different beliefs of the transfers of general dictators as is shown by the insignificant coefficients in columns 1 and 2. For specified dictator identities, the same directional effect appears as in the trust game: Northerners believe that Southerners will send less than Northerners while Southerners do not hold different beliefs about the two cultural groups on average. This effect is rather large, Northerners perceive that Southern dictators send 21% (6.1 percentage points) less of their endowment than Northerners. Again, this effect is robust to the inclusion of socioeconomic controls.

Result 4a: Northerners and Southerners do not hold different beliefs about the average selfishness of a general dictator. However, Northerners, but not Southerners, believe that their out-group is more selfish on average.

To test whether beliefs about the trustees' selfishness explains the discriminative trust identified in the previous section, I decompose trust into its conditional and unconditional components following the procedure of Ashraf et al. (2006). Accordingly, for the general treatment, I estimate the following regression,

$$y_{ij} = \alpha + \beta t + \zeta d_i + \delta N_i + \gamma Z_i + \epsilon_i \tag{3}$$

where t is a measure of the transfer amount value and d_i is i's expectation of the dictator's transfer share. β therefore captures the expectation of reciprocity: a positive estimated β indicates the belief that the share returned by the trustee increases with the amount they receive. ζ captures the expectation of generosity: a positive estimated ζ would indicate that the more generous (less selfish) a trustee is perceived, the more trust one places in them. To estimate this model to analyse the decomposition of specific trust, I include additionally an indicator for the out-group treatment and an interaction of this with the indicator for the spectator being a Northerner.

The estimated models for the general treatment are presented in Table 4 columns 1 through 4. As previously identified, the effect of the spectator's identity is not statistically significant in any regression, although the estimated coefficient is negative. This is independent of the inclusion of controls for reciprocity (Transfer) and generosity (Exp DG transfer share). Focusing on the coefficients of the decomposing factors, I find that participants expect negative reciprocity: by sending an additional token, the general trustee is expected to transfer 5.4 percentage points less of their receipt ($p < 0.001$). Conversely, the more generous the trustee is perceived, the more trustworthy they are believed to be: from column 3 a 10 percentage point increase in the believed average transfer of the trustee as a dictator leads to a 3.4 percentage point increase in the believed conditional expectation of trustee returns ($p < 0.001$). That neither the coefficient of reciprocity nor that of generosity are impacted by their joint inclusion in the model in column 4 suggests that these two effects coexist in the formulation of trust beliefs.

For specific trust, I present the estimated regressions using both Northern and Southern spectators in Table 4 columns 5 through 8. I find a similar set of results to the general treatment regarding beliefs of reciprocity and generosity in terms of their direction, size and coexistence in the trust belief formulation. This result holds when specifications are estimated solely for Northerners and Southerners (see Table A.5). Of interest here is that beliefs of reciprocity alone do not account for the discriminative trust gap as shown in column 6 where the coefficient estimate of the interaction term is unaffected by the inclusion of the transfer variable in the specification. However, including beliefs of generosity in columns 7 and 8 halves the estimated coefficient to the interaction term and it is no longer significant. This suggests that the discriminative trust exhibited by Northerners is mostly driven by beliefs of generosity among the specific group of trustees. This is confirmed

Table 4: Beliefs of transfers in trust game

Dependent Variable:	Share of tokens believed to be returned (mean)							
	General Treatment				In-Group and Out-Group Treatments			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Transfer		−0.054***		−0.054***		−0.051***		−0.051***
		(0.006)		(0.006)		(0.004)		(0.004)
Expected dictator game transfer share			0.341***	0.341***			0.380***	0.380***
			(0.034)	(0.034)			(0.030)	(0.030)
Northern	−0.012	−0.012	−0.016	−0.016	0.011	0.011	0.005	0.005
	(0.014)	(0.014)	(0.012)	(0.012)	(0.013)	(0.013)	(0.011)	(0.011)
Out-Group					0.011	0.011	0.007	0.007
					(0.012)	(0.012)	(0.011)	(0.011)
Northern × Out-Group					−0.045**	−0.045**	−0.022	−0.022
					(0.020)	(0.020)	(0.017)	(0.017)
Constant	0.398***	0.507***	0.253***	0.362***	0.249***	0.350***	0.177***	0.278***
	(0.021)	(0.025)	(0.027)	(0.031)	(0.067)	(0.067)	(0.051)	(0.052)
Socioeconomic controls	✓	✓	✓	✓	✓	✓	✓	✓
Observations	948	948	948	948	1788	1788	1788	1788
Participants	316	316	316	316	596	596	596	596
R^2	0.026	0.101	0.160	0.236	0.028	0.094	0.195	0.261

Notes: Columns (1)–(4): linear regression for the conditional expectation of trust game returns in the general treatment. Columns (5)–(8): linear regression for the in-group and out-group treatments. Transfer is a continuous variable for number of tokens hypothetically sent by the trustor. Expected dictator game transfer share is the average believed share of endowment sent by the trustee acting as a dictator. All specifications include controls for age bracket, female, university education, income bracket, and ordering of the trust and dictator game. Standard errors clustered on the participant level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

in Table A.5 column 7 in which the effect of the trustee being in the out-group for Northerners is only insignificant once beliefs of generosity are accounted for. Thus it appears that Northerners trust Southerners less than Northerners because they perceive them to be less generous, not less reciprocal.

Result 4b: Both Northerners and Southerners believe in negative reciprocity and returns to the unconditional generosity of a trustee.
Result 4c: The discriminative trust exhibited by Northerners is mostly driven by expectations of generosity.

5 Discussion

In light of the previous section, the remaining question is why does discriminative trust exist in my setting and why only among Northerners. In my heterogeneity analysis, I show that discriminative trust is particularly driven by young lower-educated subjects. This is a puzzling result, as culture is often referred to as a dynamic inherited trait in which older generations pass on beliefs and values to younger generations who then experiment with behaviours and evolve such tenets (Guiso et al., 2006). An explanation for this in my setting is that such out-group biases may be a construct of the origin of *Northernness*: those that experience the hardships of contrast against Southern culture are those that embody the most distinct discriminative norms. Specifically, it may be that young lower-educated individuals in the North are those that suffer the most from resource competition and thus their response is to exhibit the strongest out-group animosity.

This effect is identified by Fershtman and Gneezy (2001) in Israel and by Gupta et al. (2018) in India. In the latter case, the most marginalised group exhibits discriminative trust and it is argued that this is a response to the inherent social and economic structure. In England, the regional disparity has aggravated over recent years signalling that resources are particularly constrained among those with limited mobility, and this particularly falls on those from the historically marginalised North. In essence, the future looks the most bleak for those at the beginning of their career with limited opportunities to find work or relocate to regions in which work is more abundant (Duranton and Monastiriotis, 2001; Raikes et al., 2019). Indeed, this can equally be interpreted as protective as it can be retaliatory to the lack of political power among these individuals to enact change.

That my design elicits discriminative beliefs may not paint the full picture on the potential for the breakdown of trusting interactions. The present experiment elicits beliefs of trust which captures merely the presence of statistical discrimination which arises only in situations of uncertainty or with limited information (Arrow, 1972; Phelps, 1972). The identified statistical discrimination may limit the scope to initiate learning through interactions, which could lead to sustained discrimination (Guiso et al., 2008). Moreover, the incentive to learn about the true trustworthiness of a group may be further thwarted if statistical discrimination in trust is married to taste-based discrimination, a preference to avoid interacting with the out-group (Rustagi and Schief, 2024). The identification of such discrimination is beyond the scope of this paper, but may be important for policy debate if, for instance, Northerners could *learn* to trust Southerners through increased interaction, but are inclined to avoid such interactions through their preferences and beliefs. Therefore, understanding the extent to which beliefs manifest into choices of interaction partners is an important next step for research in this setting (Bornhorst et al., 2010)

The genesis of discriminative beliefs is equally a concerning area for policy discussion. The Northern identity exists as a collective utility to existing injustices which may lead to value in collective in-group positivism through motivated beliefs from an evolutionary psychology point of view (Henrich, 2004). Economically, Northerners may believe that Southerners are less trustwor-

thy since it provides personal and group-level utility to hold such a belief (Robbins and Krueger, 2005; Madarász, 2012). In support of this notion, Akerlof and Kranton (2000) show that group-relevant utility is most critical for the outsider group. In the English context, Richards and Heath (2023) find that both Northerners and Southerners exhibit in-group bias when asked to what extent each group shares their own values and in who they believe that they could get along with, the gap is substantially larger among Northerners than Southerners. Thus, if Northerners hold a heightened sense of utility from their identity and perceive their in-group as closer to them than Southerners do, this may manifest through inflated beliefs of virtues belonging to their in-group or a deflated belief of such among their out-group.

Another explanation for this survey evidence is that the cultural distance between Northerners and Southerners is most salient among Northerners as the marginalised group (Ahler and Sood, 2018; Bonomi et al., 2021). This proposition is supported by the bottom-up salience framework of Bordalo et al. (2022) who argue that the salience of inequality is asymmetric, with those in the bottom of the distribution experiencing the strongest contrast to their reference point. Thus, it may be that only Northerners discriminate since only they perceive there to be a cultural division to begin with.

6 Concluding Remarks

In this paper, I employ a novel experiment to test for the effect of regional culture on trust. I study two distinct cultures in England: the North and the South. This setting is of interest since not only are these cultures rooted in historical development, but they are also present in a long-ongoing policy debate about how to bridge an economic, political and social gap. Furthermore, since England is an extremely fiscally homogeneous country by international standards, the institutional backdrop is common across these regions, unlike, for instance, Italy and Germany where regions and states have more political power.

My experiment design proposes a solution to a commonly cited problem with canonical games which measure trust through behaviour: that behaviour may be influenced by other preferences and beliefs. This is especially alarming in a study on culture since, by definition, culture engrains a set of preferences, beliefs and values, that could jeopardise the identification of trust. Specifically, I employ a spectator design to elicit trust as a belief. This means that I elicit beliefs of trustworthiness using incentives that minimise the scope for risk pooling and concerns for distribution of outcomes and potential betrayal.

My results demonstrate that in the case of England, regional culture plays an important role in how beliefs of trust are formed. Northerners, but not Southerners, discriminate against their out-group in who they place their trust. Northerners also exhibit out-group pessimism in that they believe Southerners are less generous than Northerners. Using this, I show that discriminative trust is driven by discriminative beliefs of generosity.

A valid criticism of this framework is perhaps the validity of my sample. In the introduction, I discuss that, due to the sampled cultures being spatially separated, there is little scope for inter-group contact. However, this is something that I cannot perfectly control for. For instance, given that much of the national media and corporations are based in the South, Northerners may receive more information about Southern culture than vice versa. Southerners, on the other hand, may be less informed of the constituents of *Northernness*.

Furthermore, I categorise cultural identity by place of birth, residence, and self-identity; however, I do not account for the strength of the identity and the cultural identity of parents. Although I consider culture in this paper as a static construct, Guiso et al. (2006) argue that culture is inherited, something that I cannot measure. Given that, in the 20th Century, internal migration was

heavily skewed towards the South and that Southern regions have much higher shares of births to parents born outside of the UK than Northern regions (Office for National Statistics, 2024c), it may be that many of my sampled Southerners have inherited more outside cultural traits than my sampled Northerners.[29] In light of cultural contamination, my results may be interpreted as a lower bound to the true cultural trust gap exhibited by those that remain in their cultural region of birth.

From a policy perspective, a fruitful next step would be to consider the mechanisms through which beliefs can be shifted to foster greater intergroup trust. The effect of contact as an information provision intervention has received significant attention, albeit the results are ambiguous. Existing studies have leveraged naturally occurring contact such as random dormitory assignments (Boisjoly et al., 2006; Finseraas and Kotsadam, 2017) or variation in classroom compositions (Carrell et al., 2019; Rao, 2019) may decrease prejudice. However, other studies have found that increasing diversity can increase uncertainty and group-threat which inhibits local trust (Crisp et al., 2009; Sturgis et al., 2011; Goldschmidt et al., 2021). Moreover, these studies note how contact is a useful tool in decreasing taste-based prejudice but has little effect on beliefs (Lenz and Mittlaender, 2022). This is especially problematic in the case of trust which is a strategic interaction paved by beliefs and preferences. Despite difficulties in finding naturally occurring intergroup contact variation, Braghieri et al. (2024) and Jensen (2026) suggest that inducing contact within an experiment can have profound effects on future behaviour. Moreover, examining the accuracy of discriminative beliefs in this context would be informative for policy. If beliefs are miscalibrated, then a suitable remedy may be one of information provision to correct misperceptions. This is perhaps a challenging mandate to roll out. However, one could argue that increasing Northerners' perceptions of the generosity of Southerners would close the belief gaps and facilitate the convergence of regional development.

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[29] In 2024, 31% of live births in Northern regions were to parents where one or both were born outside the UK. In Southern regions, this figure is 46%.

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A Additional Results referenced in the text

Figures

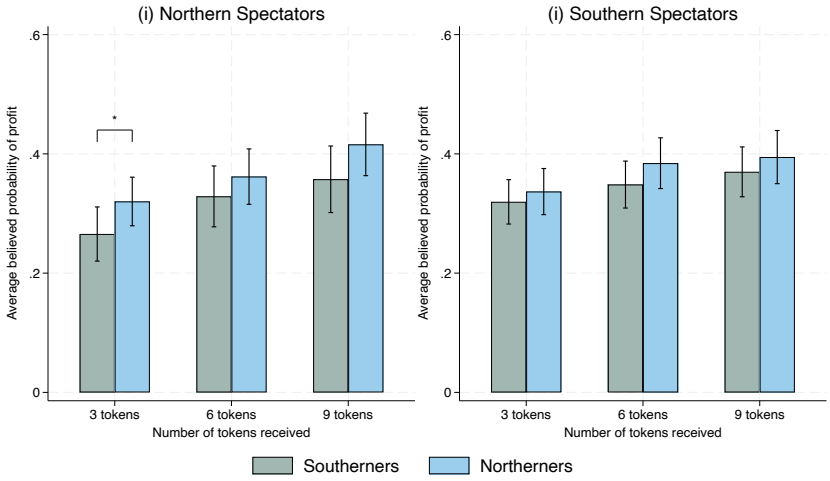


Figure A.1: Average believed probability of trustors profiting in the trust game conditional on receipt amount for (i) Northern and (ii) Southern spectators, by identity of trustee.

Panel (i) shows the average believed probability beliefs of Northern spectators for each identity of trustees and panel (ii) for Southern spectators. 95% confidence intervals shown. Stars show significance of two-sided t-test difference of means $p < 0.1$, $p < 0.05$, $p < 0.01$.

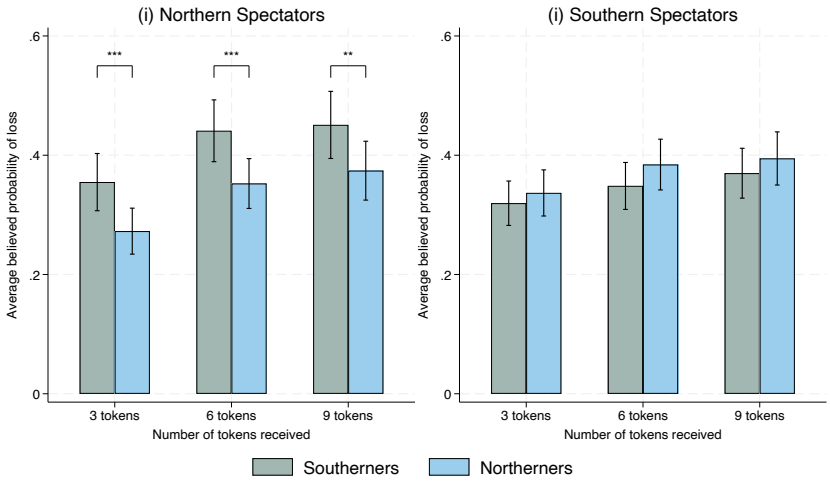


Figure A.2: Average believed probability of trustors losing money in the trust game conditional on receipt amount for (i) Northern and (ii) Southern spectators, by identity of trustee.

Panel (i) shows the average believed probability beliefs of Northern spectators for each identity of trustees and panel (ii) for Southern spectators. 95% confidence intervals shown. Stars show significance of two-sided t-test difference of means $p < 0.1$, $p < 0.05$, $p < 0.01$.

Tables

Table A.1: Sample summary table of mean socioeconomic factors between cultural groups in experiment two.

	Southerners		Northerners		p-value
	(sample)	*(population)*	*(sample)*	*(population)*	
Variable	(1)	(2)	(3)	(4)	(5)
Average Age	31.1	40.5	32.8	40.9	0.070
Share Female	0.572	0.512	0.505	0.508	0.044
Share attended university	0.520	0.530	0.566	0.432	0.165
Gross Annual Income‡	26579	42281	24210	34033	0.041
Observations	503		409		

Notes: Column (5) reports sample p-value from a two-sided t-test. Age was recorded as belonging to one of the following groups: Younger than 20 years, 20-39 years, 40-59 years, and 60 years and over. Income was elicited by asking participants in which of the following intervals their household income belonged (in British pounds): $[0, 10000)$. $[10000, 19999]$, $[20000, 29999]$, $[30000, 39999]$, $[40000, 49999]$, $[50000, 69999]$, $[70000, 99999]$, > 100000. For age and income, reported means are computed according to the median value in the discrete brackets elicited in the experiment. T-tests are conducted on these elicitations, not on the reported values in the table which are for the purpose of comparing sample to population. Data sources Office for National Statistics (2024b); Welsh Government (2025); Office for National Statistics (2024a). ‡ Population statistics are computed only for those employed: sample statistics include unemployed, students and retired individuals.

Table A.2: General trust of Northerners and Southerners, Robustness Tests

Dependent Variable:	Share of received tokens believed to be returned		
	Mover control (1)	TG First (2)	DG First (3)
Northern	-0.012	-0.017	-0.007
	(0.014)	(0.019)	(0.020)
Constant	0.444***	0.445***	0.435***
	(0.023)	(0.035)	(0.031)
Socioeconomic controls	✓	✓	✓
R^2	0.108	0.160	0.088
Observations	948	483	465
Participants	316	161	155

Notes: Linear regressions of average expectations of trustee returns over each possible receipt for general treatment. Column 1 includes the control for whether the participant stated they had temporarily moved to the other cultural region. Column 2 (3) includes data only for participants who elicited beliefs of the trust (dictator) game first. Each specification includes dummy variables for receipt value. Column 2 includes controls for age group bracket, if the participant is female, if the participant attended university, income bracket, and whether the individual has children. Specification 1 includes a control for whether the individual stated beliefs for the trust game or dictator game first. Standard errors clustered on the individual level reported in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.3: Specified trust of Northerners and Southerners, Robustness Tests

Dependent Variable:	Share of received tokens believed to be returned		
	Mover control (1)	TG First (2)	DG First (3)
Northern	0.013	0.024	0.009
	(0.013)	(0.018)	(0.018)
Out-Group	0.012	-0.008	0.028*
	(0.013)	(0.019)	(0.017)
Northern × Out-Group	-0.046**	-0.037	-0.063**
	(0.020)	(0.028)	(0.028)
Constant	0.293***	0.322***	0.347***
	(0.067)	(0.083)	(0.022)
Socioeconomic controls	✓	✓	✓
R^2	0.097	0.106	0.102
Observations	1788	843	945
Participants	596	281	315

Notes: Linear regressions of average expectations of trustee returns over each possible receipt for in-group and out-group treatments. Column 1 includes the control for whether the participant stated they had temporarily moved to the other cultural region. Column 2 (3) includes data only for participants who elicited beliefs of the trust (dictator) game first. Each specification includes dummy variables for receipt value. Column 2 includes controls for age group bracket, if the participant is female, if the participant attended university, income bracket, and whether the individual has children. Specification 1 includes a control for whether the individual stated beliefs for the trust game or dictator game first. Standard errors clustered on the individual level reported in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.4: Beliefs of transfers in trust game, Robustness Tests

Dependent Variable:	Share of tokens believed to be sent (mean)					
Sample	Males	Females	<40 years	>39 years	Non-university	University
	(1)	(2)	(3)	(4)	(5)	(6)
Northern	0.024	0.000	0.033	0.001	0.021	0.004
	(0.019)	(0.017)	(0.022)	(0.015)	(0.020)	(0.017)
Out-group	0.024	0.005	0.016	0.008	0.025	-0.000
	(0.019)	(0.016)	(0.018)	(0.016)	(0.018)	(0.018)
Northern × Out-group	-0.067**	-0.032	-0.057*	-0.044	-0.062*	-0.035
	(0.029)	(0.028)	(0.030)	(0.027)	(0.034)	(0.026)
Constant	0.268***	0.357***	0.284***	0.353***	0.303***	0.319***
	(0.069)	(0.022)	(0.068)	(0.028)	(0.069)	(0.025)
Socioeconomic controls	✓	✓	✓	✓	✓	✓
R^2	0.110	0.119	0.108	0.116	0.122	0.092
Observations	798	990	897	891	780	1008
Individuals	266	330	299	297	260	336

Notes: Linear regression of conditional expectation of trust game returns as a share of receipts for the in-group and out-group treatments. Specifications (1) and (2) partition the data by stated gender, (3) and (4) split the data by age ranges and (5) and (6) by whether the participant attended university. All specifications include controls for age bracket, female, university education, income bracket and if the participant has children, unless the specification truncates the data by this variable. All specifications include control for ordering of the trust and dictator game. Standard errors clustered on the individual level presented in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.5: Decomposition of beliefs of transfers in trust game

Dependent Variable:	Share of tokens believed to be sent (mean)							
Sample	Northerners				Southerners			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Receipt		-0.043***		-0.043***		-0.056***		-0.056***
		(0.006)		(0.006)		(0.006)		(0.006)
Expected dictator game transfer share			0.437***	0.437***			0.331***	0.331***
			(0.043)	(0.043)			(0.039)	(0.039)
Out-group	-0.036**	-0.036**	-0.013	-0.013	0.010	0.010	0.007	0.007
	(0.016)	(0.016)	(0.013)	(0.013)	(0.013)	(0.013)	(0.011)	(0.011)
Constant	0.324***	0.410***	0.212***	0.298***	0.212**	0.325***	0.155*	0.267***
	(0.019)	(0.022)	(0.021)	(0.024)	(0.101)	(0.102)	(0.082)	(0.083)
Socioeconomic controls	✓	✓	✓	✓	✓	✓	✓	✓
R^2	0.051	0.097	0.263	0.309	0.031	0.115	0.156	0.240
Observations	783	783	783	783	1005	1005	1005	1005
Individuals	261	261	261	261	335	335	335	335

Notes: Linear regression of conditional expectation of trust game returns as a share of receipts for the in-group and out-group treatments. Specifications (1) through (4) use data from Northern spectators and (5) through (8) use data from Southern spectators. All specifications include controls for age bracket, female, university education, income bracket and if the participant has children. All specifications include control for ordering of the trust and dictator game. Standard errors clustered on the individual level presented in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

B Pre-Analysis Plan Results

Description

As pre-registered, three tiers of statistical tests will be reported when evaluating research hypotheses. This is to exploit the breadth of belief data captured. First, I will present chi-squared test statistics to test the null hypothesis that the belief distributions of the two comparison groups are the same. Second, I will compute the conditional expectations implied by each belief distribution and OLS regressions to test the effect of spectator and trustee identity on trust for each conditional transfer made be a trustor.

Formally, say that at some belief elicitation, the spectator guesses the relative frequency of each possible return value conditional on player B receiving $3t$ tokens. Say that the number of possible actions of player B in this case is $n = 3t$. I denote the elicited discrete distribution by the vector $R_i^t = (\rho_i^{0|t}, \rho_i^{1|t}, ..., \rho_i^{n|t})$ where $\rho_i^{k|t}$ represents the share of trustees that i believes will have the return k tokens when t tokens are sent such that $\sum_{k=0}^{n} \rho_i^{k|t} = 1$. Then I can compute the conditional expectation of returns with the following evaluation,

$$\hat{r}^i(t) \equiv \mathbb{E}^i(r|t) = \sum_{k=0}^{3t} \rho_i^{k|t} k.$$

This constitutes my dependent variable for the regression conditional on a receipt value of $3t$. I construct the above for each value of $t = \{1, 2, 3\}$ and report a regression for each dependent variable.

In a third tier, I compute two unconditional expectations to employ as dependent variables in two further OLS specifications. This is to form an estimate of what spectators believe may actually occur if the trust game was played without the strategy method. The first unconditional expectation is denoted by $\bar{r}^i$ since it utilises uniform probability weighting on each element of $\hat{R}^i = (\hat{r}^i(0), \hat{r}^i(1), \hat{r}^i(2), \hat{r}^i(3))$. The uniform unconditional expectation is then computed by the following,

$$\bar{r}^i = \frac{1}{4}\hat{r}^i(1) + \frac{1}{4}\hat{r}^i(2) + \frac{1}{4}\hat{r}^i(3).$$

The second unconditional expectation utilises the spectator specific probability weighting of potential outcomes so is denoted by $\tilde{r}^i$. Here I introduce another vector of distribution beliefs: $\tau_i = (\tau_i^0, \tau_i^1, \tau_i^2, \tau_i^3)$ where τ_i^w measures i's beliefs about the relative probability of observing a trustor transfer of w,[30]

$$\tilde{r}^i = \tau_i^1 \hat{r}^i(1) + \tau_i^2 \hat{r}^i(2) + \tau_i^3 \hat{r}^i(3).$$

To test for the influence of socioeconomic factors on this, I estimate an additional specification which includes individual controls for age, gender, education and pre-tax income.

[30] This vector of beliefs is elicited after the spectator states their beliefs of trustee's conditional transfers and is also incentivised.

Figures

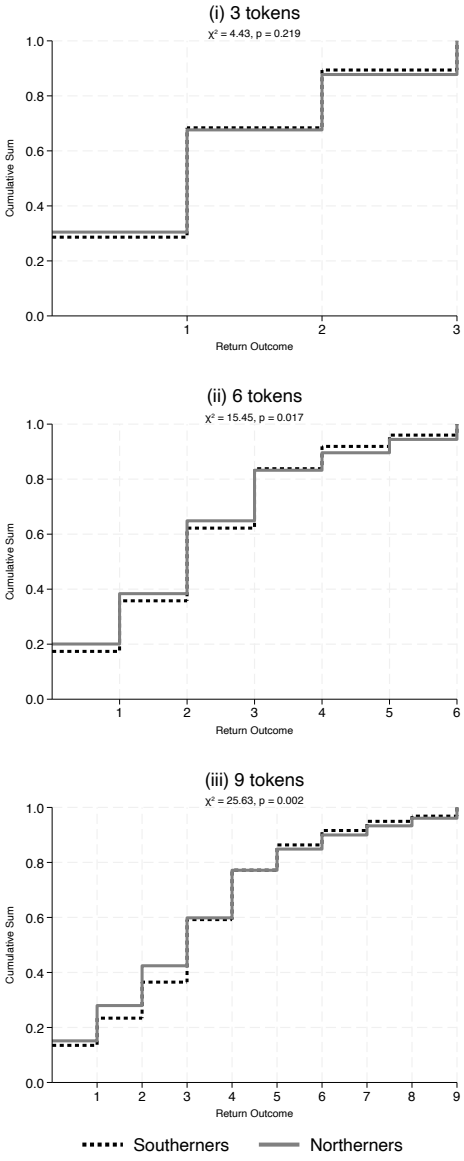


Figure B.1: Average cumulative belief distributions of conditional returns for receipts of (i) 3, (ii) 6, and (iii) 9 tokens in the General treatment by spectator identity.

Southerners and Northerners refer to the identity of the spectator. Belief of profitability is computed as the share of trustees who spectator believe return more than initial transfer. Chi-squared test statistic and p-value presented for each pair of distributions.

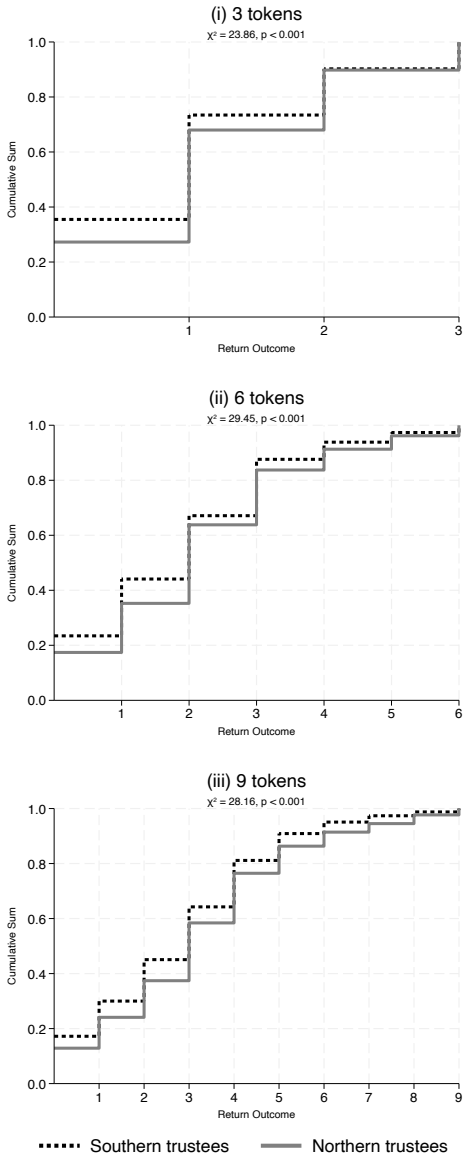


Figure B.2: Average cumulative belief distributions of conditional returns for receipts of (i) 3, (ii) 6, and (iii) 9 tokens in the In-Group and Out-Group treatments for Northern spectators.

Southerners and Northerners refer to the identity of the trustees. Belief of profitability is computed as the share of trustees who spectator believe return more than initial transfer. Chi-squared test statistic and p-value presented for each pair of distributions.

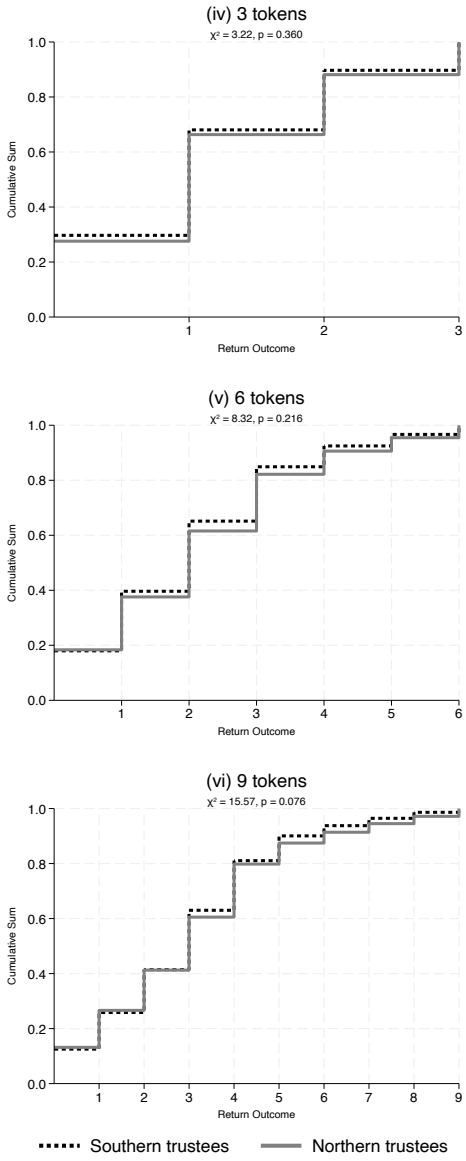


Figure B.3: Average cumulative belief distributions of conditional returns for receipts of (i) 3, (ii) 6, and (iii) 9 tokens in the In-Group and Out-Group treatments for Southern spectators.

Southerners and Northerners refer to the identity of the trustees. Belief of profitability is computed as the share of trustees who spectator believe return more than initial transfer. Chi-squared test statistic and p-value presented for each pair of distributions.

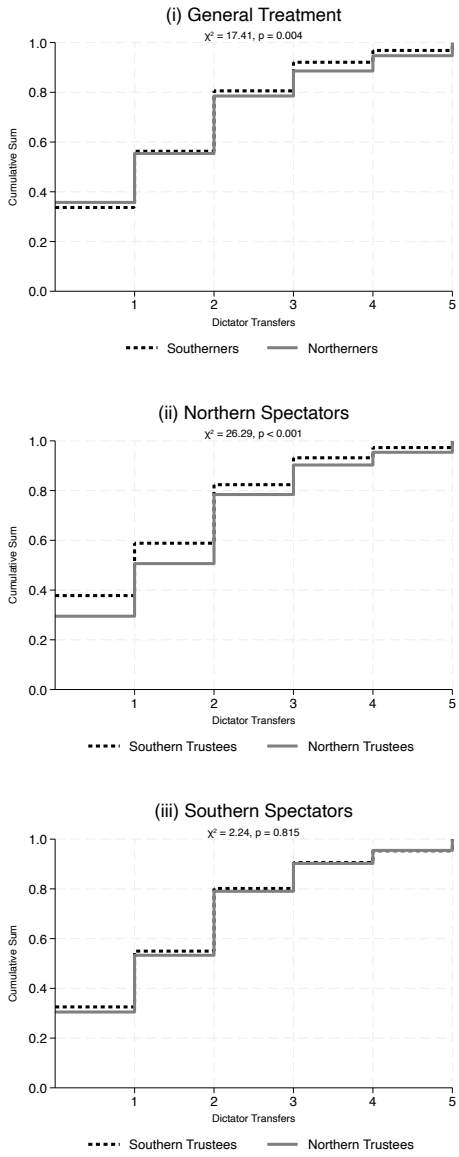


Figure B.4: Average cumulative belief distributions of amounts given in dictator game for (i) General Treatment and in the In-Group and Out-Group treatments for (ii) Northern and (iii) Southern spectators

Southerners and Northerners refer to the identity of the spectator (i) and trustees (ii) and (iii). Belief of profitability is computed as the share of trustees who spectator believe return more than initial transfer. Chi-squared test statistic and p-value presented for each pair of distributions.

Tables

Table B.1: General trust of Northerners and Southerners (conditional expectations)

Dependent Variable:	Number of tokens believed to be returned (mean)					
Receipt	3 tokens		6 tokens		9 tokens	
	(1)	(2)	(3)	(4)	(5)	(6)
Northern	0.016	0.011	-0.016	-0.036	-0.210*	-0.260**
	(0.061)	(0.064)	(0.108)	(0.111)	(0.118)	(0.122)
Constant	1.074***	1.286***	2.014***	2.779***	2.538***	2.609***
	(0.054)	(0.249)	(0.095)	(0.432)	(0.104)	(0.475)
Socioeconomic controls		✓		✓		✓
R^2	0.011	0.033	0.012	0.061	0.010	0.052
Observations	316	316	316	316	316	316

Notes: OLS regression of expectations of trustee returns conditional on number of tokens received using data from General treatment group. Even number specifications include controls for age group bracket, if the participant is female, if the participant attended university, and income bracket. All specifications include a control for the ordering of the trust and dictator game. Standard errors in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.2: General trust of Northerners and Southerners (unconditional expectations)

Dependent Variable:	Unconditional tokens believed to be returned			
	Equal weight		Subj. weight	
	(1)	(2)	(3)	(4)
Northern	-0.052	-0.071	0.031	0.021
	(0.052)	(0.054)	(0.089)	(0.093)
Constant	1.407***	1.668***	1.160***	1.409***
	(0.0456)	(0.211)	(0.078)	(0.362)
Socioeconomic controls		✓		✓
R^2	0.011	0.045	0.014	0.038
Observations	316	316	316	316

Notes: Even number specifications include controls for age bracket, female, university education and income bracket. (1) and (2) regress the unconditional expectation of returns as computed using equal weighting of conditional expectations; (3) and (4) regress the unconditional expectation of returns as computed using spectators' subjective weighting of conditional expectations. All specifications include controls for the ordering of the trust and dictator game. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.3: Specific trust of Northerners and Southerners (conditional expectations)

Dependent Variable:	Number of tokens believed to be returned (mean)					
Receipt	3 tokens		6 tokens		9 tokens	
	(1)	(2)	(3)	(4)	(5)	(6)
Northern	0.032	0.036	0.109	0.095	0.059	0.049
	(0.062)	(0.063)	(0.107)	(0.108)	(0.123)	(0.125)
Out-Group	0.062	0.051	0.128	0.135	-0.078	-0.077
	(0.060)	(0.060)	(0.102)	(0.103)	(0.117)	(0.119)
Northern × Out-Group	-0.209**	-0.192**	-0.398**	-0.394**	-0.045	-0.054
	(0.091)	(0.091)	(0.154)	(0.155)	(0.177)	(0.180)
Constant	1.071***	0.632**	1.914***	1.527***	2.379***	2.525***
	(0.048)	(0.249)	(0.082)	(0.423)	(0.094)	(0.491)
Socioeconomic controls		✓		✓		✓
R^2	0.021	0.046	0.027	0.055	0.012	0.025
Observations	596	596	596	596	596	596

Notes: Linear regressions of expectations of trustee returns conditional on number of tokens received using data from the In-Group and Out-Group treatment groups. Even number specifications include controls for age bracket, if the participant is female, if the participant attended university, and income bracket. All specifications include a control for the ordering of the trust and dictator game. Standard errors in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.4: Specific trust of Northerners and Southerners (unconditional expectations)

Dependent Variable:	Unconditional tokens believed to be returned			
	Equal weight		Subj. weight	
	(1)	(2)	(3)	(4)
Northern	0.050	0.0450	0.105	0.096
	(0.056)	(0.057)	(0.094)	(0.095)
Out-group	0.0280	0.027	0.041	0.0345
	(0.054)	(0.054)	(0.090)	(0.090)
Northern × Out-group	-0.163**	-0.160*	-0.278**	-0.265*
	(0.0813)	(0.0822)	(0.136)	(0.136)
Constant	1.341***	1.171***	1.137***	0.488
	(0.043)	(0.224)	(0.072)	(0.371)
Socioeconomic controls		✓		✓
R^2	0.011	0.045	0.014	0.038
Observations	316	316	316	316

Notes: Linear regressions of unconditional expectation of amount returned to trustor by spectators in In-Group and Out-Group treatment groups. Even number specifications include controls for age bracket, female, university education and income bracket. (1) and (2) regress the unconditional expectation of returns as computed using equal weighting of conditional expectations; (3) and (4) regress the unconditional expectation of returns as computed using spectators' subjective weighting of conditional expectations. All specifications include controls for the ordering of the trust and dictator game. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.5: Effect of dictator beliefs on trust (conditional expectations)

Dependent Variable:	Number of tokens believed to be returned (mean)					
Receipt	3 tokens		6 tokens		9 tokens	
	(1)	(2)	(3)	(4)	(5)	(6)
(a) General analysis						
Northern	0.0022	-0.018	-0.055	-0.091	-0.264**	-0.272**
	(0.064)	(0.055)	(0.111)	(0.096)	(0.121)	(0.121)
Expected dictator game transfer share		0.309***		0.542***		0.115*
		(0.032)		(0.054)		(0.068)
Constant	1.307***	0.652***	2.823***	1.677***	2.618***	2.375***
	(0.249)	(0.226)	(0.434)	(0.393)	(0.474)	(0.493)
Socioeconomic controls	✓	✓	✓	✓	✓	✓
R^2	0.022	0.266	0.045	0.286	0.052	0.061
Observations	316	316	316	316	316	316
(b) In-group vs. Out-group analysis						
Northern	0.0360	0.011	0.095	0.046	0.049	0.030
	(0.063)	(0.055)	(0.108)	(0.089)	(0.125)	(0.123)
Out-group	0.051	0.038	0.135	0.108	-0.077	-0.087
	(0.060)	(0.052)	(0.103)	(0.084)	(0.119)	(0.117)
Northern × Out-group	-0.192**	-0.100	-0.394**	-0.214*	-0.0543	0.0117
	(0.0913)	(0.0796)	(0.155)	(0.128)	(0.180)	(0.178)
Expected dictator game transfer share		0.308***		0.605***		0.222***
		(0.0224)		(0.0360)		(0.0501)
Constant	0.632**	0.345	1.527***	0.961***	2.525***	2.316***
	(0.249)	(0.217)	(0.423)	(0.349)	(0.491)	(0.485)
Socioeconomic controls	✓	✓	✓	✓	✓	✓
R^2	0.046	0.280	0.055	0.365	0.025	0.057
Observations	596	596	596	596	596	596

Notes: Linear regression of expectations of trustee returns conditional on number of tokens received. Even specifications include the control for expectations of transfer amount in the dictator game. All specifications include controls for age bracket, female, university education and income bracket. All specifications include control for ordering of the trust and dictator game. Panel (a) includes the analysis of the model using data from the general treatment comparing beliefs of cultural identities. Panel (b) includes the difference in difference analyses comparing in-group and out-group trust. Standard errors in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.6: Effect of dictator beliefs on trust (unconditional expectations)

Dependent Variable:	Effect of dictator beliefs on trust using unconditional expectations			
	Equal weight		Subj. weight	
	(1)	(2)	(3)	(4)
Northern	0.045	0.022	0.096	0.048
	(0.057)	(0.049)	(0.095)	(0.073)
Out-group	0.027	0.015	0.035	0.009
	(0.054)	(0.047)	(0.090)	(0.070)
Northern × Out-group	-0.160*	-0.0757	-0.265*	-0.0910
	(0.0822)	(0.0711)	(0.136)	(0.106)
Expected dictator game transfer share		0.284***		0.586***
		(0.0200)		(0.0298)
Constant	1.171***	0.905***	0.488	-0.0605
	(0.224)	(0.194)	(0.371)	(0.289)
Socioeconomic controls	✓	✓	✓	✓
R^2	0.046	0.292	0.066	0.441
Observations	596	596	596	596

Notes: Linear regressions of unconditional expectation of amount returned to trustor by spectators in In-Group and Out-Group treatment groups. Even specifications include the control for expectations of transfer amount in the dictator game. All specifications include controls for age bracket, female, university education and income bracket. All specifications include control for ordering of the trust and dictator game. Panel (a) includes the analysis of the model using data from the general treatment comparing beliefs of cultural identities. Panel (b) includes the difference in difference analyses comparing in-group and out-group trust. Standard errors in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

C Instructions

3a Experiment 1

3a.1 Welcome

Thank you for taking part in this experiment. During the experiment, you will make decisions in 2 stages.

In participating, you will receive a participation fee of £1.00 and have the opportunity to earn a bonus of up to £18.00 depending on your decisions and the decisions of another randomly chosen individual.

Consent
All data collected in this experiment is anonymized. Only anonymous data may be shared in open science repositories. At any point in the experiment, you may opt out and return your submission. Incomplete experiments will be discarded before analysis. Incomplete submissions will not receive payment.

All information in this experiment referring to other participants is true and relates to real human participants. The decisions which you make in this experiment impact your remuneration and the remuneration of another individual. No individuals will be made aware of your identity.

There are no known risks to this experiment and you are not required to provide any personally identifiable information.

This study has received ethical approval from the Norwegian School of Economics' Institutional Review Board. Should you have any further questions regarding this study, please contact ethan.oleary@nhh.no.

Should you agree to these terms, please indicate so below and click on the 'next' button beneath. If you disagree, you may withdraw now by closing this tab and returning your submission.

3a.2 Classification Questions

In order to be eligible for this experiment, a few criteria need to be met. Please answer the following questions truthfully.

Were you born in England?

In which region of England were you born?
(If you are unsure, please input your best guess)

Do you currently live in England? In which region of England do you currently live?
(If you are unsure, please input your best guess)

Which of the following best describes your regional identity?

3a.3 Other Questions

Which age bracket do you belong to?

What is your gender identity?

What is the highest level of education that you have achieved?

3a.4 Acceptance

Thank you, your responses deem you eligible for participation in this study. You may now proceed to the first stage of the experiment.

3a.5 Trust Game

Both you and your partner receive the same information below about the decisions that you each will make. One of you will be assigned as person A and the other as person B. Recall that each token has a real cash value of £2.00.

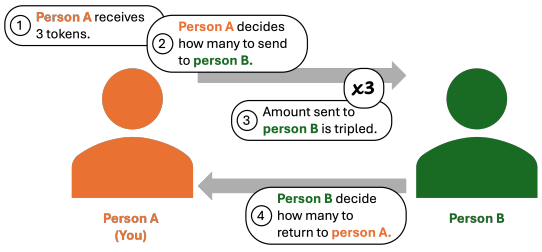
Instructions
Person A starts with 3 tokens, and Person B starts with none. Person A can send some, all, or none of their tokens to Person B. Any tokens kept by Person A are theirs. For every token sent, Person B receives 3 tokens.

For example, if Person A sends 2 tokens, Person B will receive 6 tokens.

Person B then decides how many tokens to return to Person A.

Person A's earnings are the tokens they kept plus any returned to them. Person B's earnings are what they received minus what they returned.

If person A
You have been assigned to the role of **person A** in this stage. The below diagram visualises the instructions. Soon you will make your decision. However, before doing so, we need to check your



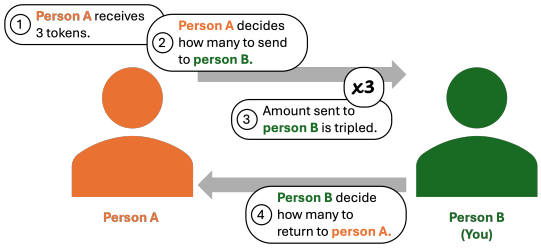
comprehension of the instructions. Click next to proceed.

<COMPREHENSION QUESTIONS>

You have now been given 3 tokens. You may now choose how many tokens you wish to transfer to your partner. The amount transferred is tripled and then your partner will decide how many they wish to return to you.

If person B
You have been assigned to the role of **person B** for this stage. The below diagram visualises the instructions

Your partner can send you either 0, 1, 2 or 3 tokens. You need to decide how many tokens you



would like to return in each of these scenarios. After you have made your choices, your partner will make theirs and your payoffs will be computed accordingly.

However, before making your decisions, we need to check your comprehension of the instructions. Click next to proceed.

< COMPREHENSION QUESTIONS>

You need to now decide how many tokens you will return in each possible scenario of this stage. Your partner will choose an amount to send to you, and then your decision for that specific scenario will be used to determine your payment for this stage.

Suppose your partner sends you 1/2/3 token(s) and accordingly you receive 3/6/9 tokens. How many tokens would you like to return in this scenario?

3a.6 Dictator Game

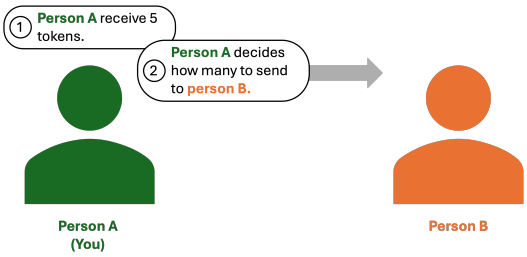
Both you and your partner receive the same information below about the decisions that you each will make. One of you will be assigned as person A and the other as person B. Recall that each token has a real cash value of £2.00.

Instructions
Person A first receives 5 tokens while person B receives nothing. Person A can send some, none, or all of their tokens to person B.

Person A's earnings from this round are the tokens they do not send. Person B's earnings equal the tokens they receive.

If person A You have been assigned to the role of **person A** for this stage. The below diagram visualises the instructions. Soon you will make your decision. However, before doing so, we need to check your comprehension of the instructions. Click next to proceed.

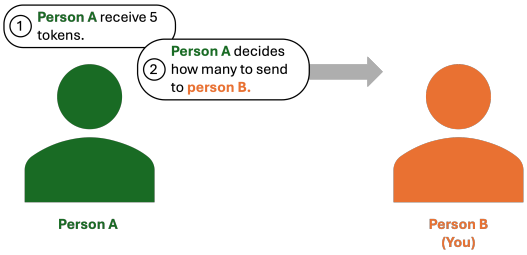
<COMPREHENSION QUESTIONS>



You have now been given 5 tokens each worth £2.00. Your partner has not been given any.

How many of your tokens would you like to send to your partner?

If person B You have been assigned to the role of person B in this stage. The below diagram visualises the instructions. You do not need to take an action in this stage. Click next to



move on.

3b Experiment 2: Spectator

Welcome and initial questions are identical as to the above expect individuals received a participation fee of £1.30 and had the opportunity to earn bonus up to £7.00

3b.1 Experiment Overview

Prior to today, we asked 10 pairs of real participants to make decisions in two stages. Your task will be to correctly guess what happened in these stages.

To submit your guesses, you will need to use an interface to state the number of times you think each possible outcome occurred. The next slide will explain the functionality of the interface and give you an opportunity to practice using it.

3b.2 Practice

Consider a bag containing 5 balls, each a different colour: blue, red, black, white and yellow. We randomly drew a ball from the bag, recorded the colour, and then put it back. This was repeated 10 times. This means that for each draw, the probability of each colour being drawn is equal.

Your task is to guess the outcomes of this experiment.

Below, you will find 5 sliding scales, each representing one of the possible outcomes (each colour). Use these scales to guess how many times each colour was drawn out of the 10 draws.

To submit your answer, the values of the sliders must add up to 10. A counter will show how many guesses you have left to make.

If your guesses are correct, you will receive a £0.50 bonus.

3b.3 Experiment Introduction

Prior to today, we recruited 10 pairs of real participants to make decisions in two stages using this online service. Well refer to these individuals as "players" and the other individual in their pair as their "partner".

The decisions that the players made involved tokens. Each token carried a cash value of £2.00. Players were paid the cash value of their token balance after one of the two stages chosen at random.

Your task is to guess the outcomes of these decisions.

If in general treatment
Specifically, we recruited 20 individuals who were born in and continue to live in England and randomly matched them together.

If not in general treatment
We recruited players from two recruited pools. Pool 1 recruited 10 Northerners/Southerners. For this sake, we define a Northerner as one who was born in the North of England (the North East, the North West and Yorkshire and the Humber), continues to live in this region and identifies with the Northern identity. For this sake, we define a Southerner as one who was born in the South of England (East Anglia, London, the South East and the South West), continues to live in this region and identifies with the Southern identity.

Pool 2 recruited 10 individuals who were born in and continue to live in England, but was not specific to their regional identity.

We matched each individual from pool 1 to an individual from pool 2. Players never learned the identity of the other player in their pair. They only knew that their partner was born in and continues to live in England.

All treatments
Before you guess the outcomes of each stage, you will read the same instructions that were given to the players and answer a few questions to confirm your understanding of the instructions.

3b.4 Trust Game

In the grey box are the instructions that all players read about stage 1 before they started. Each player also observed an image like the one below tailored to their role.

If not in general treatment
In each pair, individuals from Pool 1 were assigned the role of person B while individuals from Pool 2 were assigned the role of person A. Therefore each person B was a Northerner/Southerner. Players only knew that their partner was born in and lives in England.

All treatments

Instructions

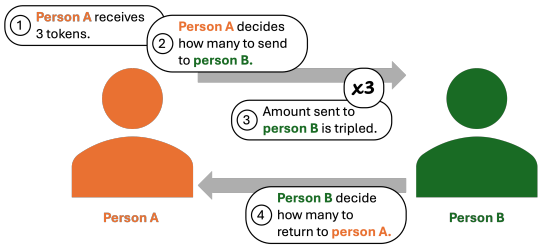
Person A starts with 3 tokens, each worth £2.00, and Person B starts with none. Person A can send some, all, or none of their tokens to Person B. Any tokens kept by Person A are theirs. For every token sent, Person B receives 3 tokens.

For example, if Person A sends 2 tokens, Person B will get 6 tokens.

Person B then decides how many tokens to return to Person A.

Person A's earnings are the tokens they kept plus any returned to them. Person B's earnings are what they received minus what they returned.

The below diagram visualises the instructions. Soon you will be given information about your



specific task. However, before doing so, we need to check that you understand the instructions. Click next to proceed.

<COMPREHENSION QUESTIONS>

We asked person A and person B to make their decisions simultaneously.

We asked each person B to prespecify how many tokens they would return in each possible scenario: **for each possible amount they could receive**. We also asked each person A how many tokens they would like to send.

Players did not learn the decisions of their partner until after the experiment.

If not in general treatment

In each pair, individuals from Pool 1 were assigned the role of person B while individuals from Pool 2 were assigned the role of person A. Therefore each person B was Northern/Southern. Players only knew that their partner was born in and lives in England.

All treatments

Your task is to guess the decisions of the 10 person Bs. Specifically, for each possible scenario we presented to the person Bs, we want you to guess how many times each possible answer was given. Click next to move on to the first question.

We first asked the following to each person B:

Suppose your partner sends you 1/2/3 token and accordingly you receive 3/6/9 tokens.
How many tokens would you like to return in this scenario?

In the interface below, you will see sliding scales for each possible outcome: the number of tokens that person B may return to person A.

Use these sliders to guess how many of the 10 person Bs returned each possible amount.

To submit your answer, the values of the sliders must add up to 10. A counter will show how many guesses you have left to make.

If all your guesses are correct, you will receive a bonus of £1.00/£1.50/£2.00.

What about person A?
In the game, each person A had to decide how many of their 3 tokens they wished to transfer. Recall that they did not know the identity of their partner.

Use these sliders to guess how many of the 10 person As sent each possible amount.

To submit your answer, the values of the sliders must add up to 10. A counter will show how many guesses you have left to make.

If all your guesses are correct, you will receive a bonus of £1.00. Dictator Game In the grey box are the instructions that all players read about stage 1/2 before they started. Each player also observed an image like the one below tailored to their role.

If not in general treatment
In each pair, individuals from Pool 1 were assigned the role of person A while individuals from Pool 2 were assigned the role of person B. **Therefore each person A was Northern/Southern**. Players only knew that their partner was born in and lives in England.

All treatments
Instructions
Person A first receives 5 tokens, each worth £2.00, while person B receives none. Person A may send some, none, or all of their tokens to person B.

Person A's earnings from this round are the tokens they do not send. Person B's earnings equal the tokens they receive.

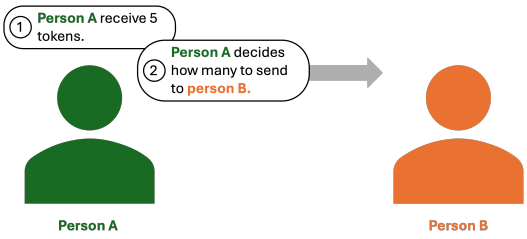
The below diagram visualises the instructions.

Soon you will be given information about your specific task. However, before doing so, we need to check that you understand the instructions. Click next to proceed.

<COMPREHENSION QUESTIONS>

We asked each person A how many tokens they wish to send to their person B.

If not in general treatment



Recall that each person A was Northern/Southern and each person B was someone born and living in England.

If in general treatment
Recall that each player was was someone born and living in England.

All treatments
In the below interface, you can see that there are sliding scales corresponding to each possible outcome: the number of tokens that person A may transfer to person B.

You need to use the sliding scales to guess how many of the 10 person As sent each possible amount.

To submit your answer, the values of the sliders must add up to 10. A counter will show how many guesses you have left to make.

If your guesses are all correct, then you will be rewarded with a bonus of £1.00.

3b.5 Outro

Thank you for completing the two stages, we now have a few final questions we wish to ask you before you finish.

What is your employment status?

How many children do you have?

What is your yearly income (pre-tax)?

Have you ever lived in other areas of England? If so, please type where below. If the answer is no then type NA below.

Please indicate to what extent you agree with the following statement where **1 means you strongly disagree** and **7 means you strongly agree**.

> Most people can be trusted.

We also asked 100 Northerners/Southerners to what extent they agreed with the statement. Please indicate how many of these individuals you believe selected a 6 or 7 in their answers (the strongest in agreement).
You will receive a bonus of £1.00 if your guess is within 2 of the correct answer.

D Experiment elicitation tools

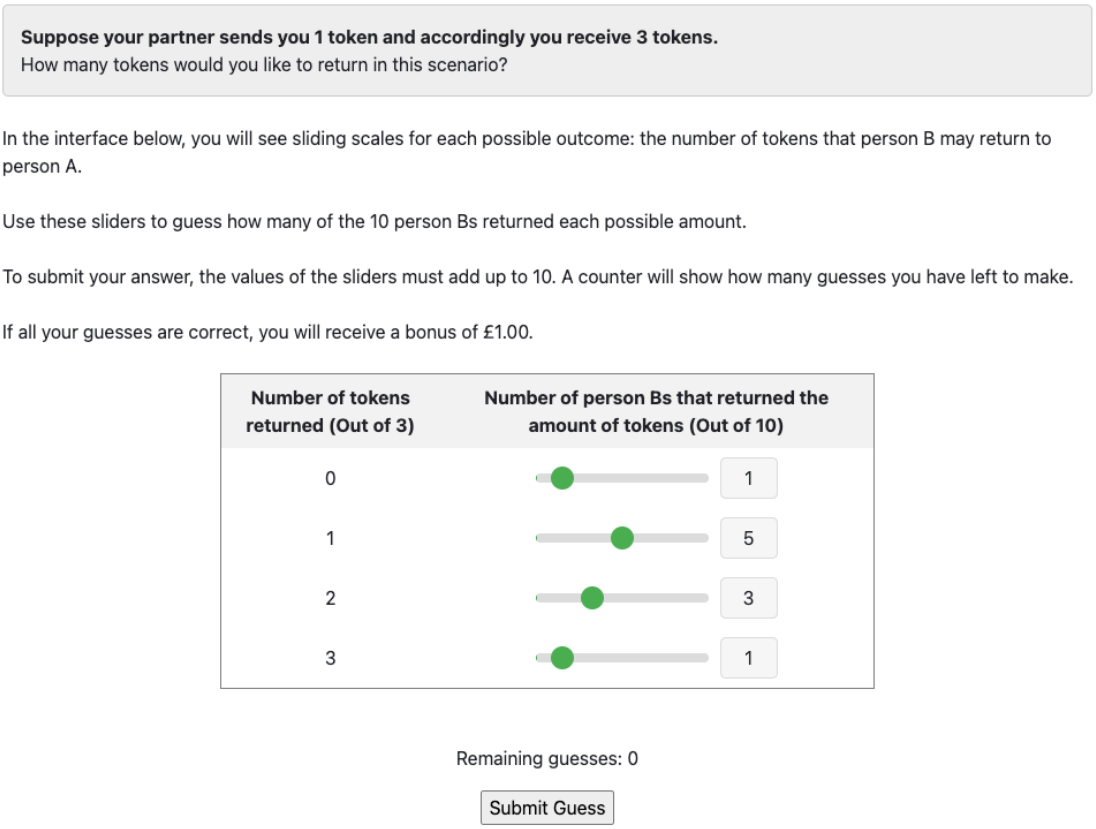


Figure D.5: Elicitation tool for beliefs of the distribution of transfers in the online experiment