



## Measuring people's trust

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**Summary.** We measure trust and trustworthiness in British society with a newly designed experiment using real monetary rewards and a sample of the British population. The study also asks the typical survey question that aims to measure trust, showing that it does not predict 'trust' as measured in the experiment. Overall, about 40% of people were willing to trust a stranger in our experiment, and their trust was rewarded half of the time. Analysis of variation in the trust behaviour in our survey suggests that trusting is more likely if people are older, their financial situation is either 'comfortable' or 'difficult' compared with 'doing alright' or 'just getting by', they are a homeowner or they are divorced, separated or never married compared with those who are married or cohabiting. Trustworthiness also is more likely among subjects who are divorced or separated relative to those who are married or cohabiting, and less likely among subjects who perceive their financial situation as 'just getting by' or 'difficult'. We also analyse the effect of attitudes towards risks on trust.

**Keywords:** Experiment; Risk; Trust; Trust game; Trustworthiness

### 1. Introduction

Trust is an important lubricant for social and economic transactions. Higher levels of trust and trustworthiness can reduce transaction costs by allowing the use of informal agreements instead of complex contracts and their costly enforcement. For example, in many instances, a 'principal' delegates tasks to an 'agent' whose objectives are different, and the principal cannot check completely the agent's performance (e.g. bad outcomes could arise from low effort or bad luck). Everyday examples include taking your car to a mechanic, hiring a baby-sitter and employing

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a research assistant. Even when performance monitoring is possible, it is often too costly to devise a contract that fully accounts for all the possible contingencies of the relationship. Costly contracting, in the absence of effective informal agreements based on trusting others to fulfil their part and on abiding by such agreements when others trust us to do so, may preclude beneficial transactions. Even when interacting with strangers, trust is important for the smooth functioning of society; for example, taxi-drivers must trust that the passenger will pay the bill at the destination. Thus, opportunities for mutually beneficial transactions are lost in societies in which people cannot trust each other.

The primary aim of our research is to obtain measures of the extent of trust and trustworthiness in British society for simple trust situations involving strangers, in which stakes are relatively small and, even though there are no contractual obligations, ‘trustees’ are clear about the trusters’ expectations. We also study how trust and trustworthiness vary by certain characteristics of the British population.

A common approach is to try to measure trust in surveys, through responses to questions such as the following (from the World Values Survey, General Social Survey (US) and British Household Panel Study (BHPS)): ‘Generally speaking, would you say that most people can be trusted, or that you can’t be too careful in dealing with people?’. Answers to questions such as this are difficult to evaluate, however, partly because they are attitudinal and partly because the questions themselves are too generic: the answers do not reveal either the reference group or the types of action or the stakes that respondents have in mind when making such an assessment; and variations in any of these respects could be large. Nevertheless, this question has been used to measure trust in around 500 references that analyse the economic effects of trust (according to Sapienza *et al.* (2007)), and in particular it has been employed to study trust in Britain as a function of individual attributes and measures of neighbourhood attachment, social networks and civic participation (Li *et al.*, 2005).

Even if one thought that there was some value in asking this type of survey question about trust, attitudinal questions about a person’s trustworthiness would be useless for obvious reasons. Everyone would reply ‘yes, of course, I am trustworthy!’, and some will be telling the truth, but we would not know which. As a result, the ample trust literature that relies on survey data is inevitably silent on the extent to which people’s trust in others is an idiosyncratic disposition, or a belief or a response to actual trustworthiness. Without some measure of trustworthiness we have no idea of whether the level of trust reflects the level of actual trustworthiness.

An alternative approach, which has spread in recent times, is to measure trust and trustworthiness through experiments that use real monetary rewards (see Camerer (2003), page 83 and following feature for a review). This method has the advantage of providing behavioural measures and of being clearer about the type of situation, the stakes and the reference group—usually anonymous subjects in the experiment. Experiments also, however, are often carried out with limitations, one of which is that they are administered mostly to students, who are usually self-selected subjects and unrepresentative of the adult population (for example compare the distributions of the measure of ‘trust’ in Bellemare and Kroeger (2007) for their ‘laboratory’ and ‘representative’ samples). Laboratory experiments also usually lack a sufficient range and variation of information on individual attributes that are needed to investigate the individual level correlates of both trust and trustworthiness.

To overcome those shortcomings our contribution follows a different approach. We combine the experimental method with both a sample from the general population *and* the survey method. This approach makes it possible to obtain sound and representative *behavioural* measures of both trusting and trustworthiness, and in addition it allows the gathering of data on individual attributes. We know of only two other instances, neither of which was in the UK,

in which trust game experiments (TGEs) have been carried out with a representative sample of the population and combined with survey questions—one was carried out in Germany (Fehr *et al.*, 2002) and gave us the original inspiration; the other in the Netherlands (Bellemare and Kroeger, 2007). Other trust studies have also used population samples (e.g. Barr (2003) and Schechter (2007)), but ones that are less representative of the population than these two studies.

In addition, we use a new experimental design which was developed by Ermisch and Gambetta (2006) that differs in various ways from the trust game that is used in most trust experiments. We believe that the differences that we introduce allow it to provide better measures of the concepts of trust and trustworthiness.

Our main aim is to measure levels of basic trust and trustworthiness in British society in interactions between strangers, including their variation within the population, and also to illustrate the methods that we use. Although not novel in its broad outline, the particular constellation of methods that we adopt is original, and its interest may go beyond the study of trust as it could be applied to investigating other decisions. The paper proceeds as follows. First we clarify what we mean by 'trust' and explain the experiment that we carry out. Next we discuss our sampling frame, procedures, survey methods and the external validity of our experimental measure. Section 5 presents the main outcomes of the experiment. Section 6 compares behavioural and survey measures of trust and Section 7 examines the effect of risk attitudes on trust. Section 8 presents our conclusions about measuring trust.

## 2. What do we mean by 'trust'?

We work with a notion of trust that relates it to specific acts and makes it easy to capture it empirically (Bacharach and Gambetta, 2001). We trust when *we trust that someone will do X*—repay a loan; arrive on time; play fair; pay the fare; feed the cat; treat baby well; do his job as expected. The trust that we have in someone doing X does not necessarily extend to trust in that same person doing Y.

More precisely, we say that a person 'trusts someone to do X' if the truster (a 'he' for convenience) acts on the expectation that the trustee (a 'she') will do X when both know that two conditions obtain.

- (a) If she fails to do X he would have done better to act otherwise—'if I knew she was a cheat I would not have lent her the money'. If trust is fulfilled the truster is better off than he would be if he had not trusted, but if trust is not fulfilled he is worse off.
- (b) His acting in the way that he does gives her the opportunity to pursue a selfish reason not to do X—'if I hadn't lent her the money she could not have cheated me'.

A trustworthy trustee is simply one who does X when those two conditions obtain.

The decision whether to trust or not involves three components. First, we can expect that subjects will consider the *returns* to trusting when trust is fulfilled relative to the cost of trust when it is unfulfilled. Next, there is the *expectation* that the trustee will do X, framed in terms of a probability (Gambetta, 1988; Barr, 2003), and, thirdly, in all cases in which the probability is less than 1, a person's willingness to take the *risk of being exploited* comes into play. In our study we do not vary the monetary returns and concentrate on the second and third dimensions only.

The level of expectation is the result of beliefs about other people's trust warranting qualities with regard to doing X. These beliefs are in turn based, at least in part, on *learning through experience*. In most real life circumstances these beliefs refer to specific people or groups of people whom we believe share certain trust warranting properties. When interacting with anonymous strangers, trusters' beliefs can be understood as being not *ad personam* but about the

frequency of trust warranting properties relating to doing X in the population of anonymous trustees—in our case the generic group consisting of people living in the UK and participating in the experiment. The willingness to take the risk of exposure captures a preference or disposition relating to the character traits and state of mind of the trustor; in addition, this preference may be responsive to the nature of the trust situation itself: a person may be more willing to take risks in lending one’s car than in employing a baby-sitter.

### 3. Experimental design

#### 3.1. The experiment

The game that we presented to subjects, whom we shall call the trustor (R, ‘he’) for convenience and the trustee (E, ‘she’), is a basic ‘one-shot’ trust game in binary form. (The computer-assisted personal interview script for the experiment is given in Appendix A.) R receives a £10 banknote at the onset of a professional interviewer’s visit to his home; it is described as compensation for taking part in the interview *cum* experiment. R is told that he will have the opportunity to obtain £22 if he gives the money to another person (E) with whom he has been randomly matched and about whom he is told nothing. He is told that the experimenter will increase it by £30 and so E will receive £40, who then will be offered the choice either to pay back £22 to R, or to keep all £40. If he decides to give £10, R is informed that he will know the outcome of E’s decision in about 4 weeks. The procedures ensure that the interviewer does not observe or otherwise know his decision.

If R chooses to pass the £10 on, E is given, by a different interviewer who visits her at her home, two cheques that are made out in her name: one for £40 and one for £18, either of which she can cash without delay. E is told that R was informed that E would be making the choice of whether to pay back £22 to R or to keep the whole £40 before R decided to pass on £10. Again, the interviewer does not know her decision. Our procedures are thus, in a sense, ‘double blind’: the interviewer knows the subjects’ name and address but not their decisions, whereas the researcher knows the subjects’ decisions, but identifies them by their code numbers, not associating them to their name or address.

The pay-offs that we used in the experiment are illustrated in Fig. 1. If R decides to pass on the £10 it means that he ‘trusts’ in the precise sense defined above: that he expects E to resist the pull of her ‘raw’ monetary pay-offs and to return the £22. We have chosen the amount specified to be paid back in the case that E fulfils trust in a way that makes the pay-offs asymmetric. Symmetric payments may encourage fulfilling trust for reasons of fairness, rather than because E does what is expected of her (for example see Bacharach *et al.* (2001), Bohnet and Huck (2004) and Bohnet *et al.* (2005)).

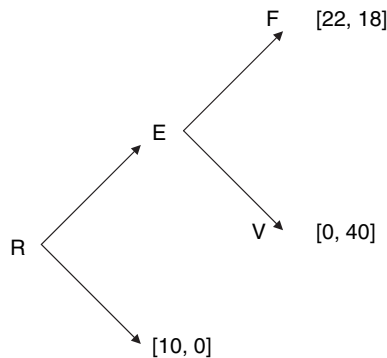


Fig. 1. Structure of pay-offs in the TGE (F, fulfil trust; V, violate trust): R’s pay-offs are listed first in the brackets

For half of the sample we used a second treatment, in which R receives £12 in cash (a £10 note and a £2 coin) as compensation for taking part in the interview *cum* experiment. R is offered the binary choice of either keeping the whole £12 or giving £10 to E and keeping £2. The remaining steps are the same as in the previous treatment. There was no significant difference in behaviour between these two treatments, and so we shall not distinguish between them in the rest of the paper.

The outcome variables of interest are the probability that R passes £10 on ('trusts') and the probability that E pays back the £22 ('fulfils trust').

### 3.2. Key features of our design

Our design differs from that of the standard TGE (Berg *et al.*, 1995; Glaeser *et al.*, 2000), which was also used by Fehr *et al.* (2002) and Bellemare and Kroeger (2007). Ermisch and Gambetta (2006) have provided a detailed critique of the standard TGE, arguing that it lacks the basic features of a trust situation *even in a one-shot case*, and, as a result, this blurs the link with clear notions of trust and trustworthiness *and* introduces confounding effects. The binary TGE that was outlined above is more realistic than the standard experiment and more precisely captures a clear notion of trust and trustworthiness. This is for the following reasons.

- (a) R 'gains' his money as compensation for taking part in the interview *cum* experiment and this is given to him in cash and before the interview begins. We expect that this should trigger an 'endowment effect' and make R more careful in parting with it, as he would be with his own money.
- (b) We depart dramatically from the standard TGE, in which R can pass on *any* amount, by forcing R's exposure to a loss of either all (or 83% in the second treatment) of the sum that he receives as a participation payment. In our view, the possibility of transferring any amount favours the intrusion of other motives such as 'gift giving', or 'let's risk part of it'. The distribution of amounts that are passed on in standard TGEs is consistent with the operation of these other motives. It usually covers the entire range, with a distinct modal value of about 50% of R's initial endowment and short 'spikes' at 0% and 100% (see Fehr *et al.* (2002), Bellemare and Kroeger (2007) (their 'representative sample') and Barr (2003)). Freedom to pass on any amount confounds these other motives with trust, which is a relevant consideration in the decision if and only if R's decision is driven by his self-interested aim to gain more if trust is fulfilled.
- (c) In the standard TGE, E can return any amount to R. In our design, R knows in advance how much he can expect back from E if E fulfils trust, and E knows that this was an expectation of R when he made his decision. E thus knows that she cannot be just a little more or a little less trustworthy; she must choose whether to be trustworthy or not. Thus, in this binary TGE it is clear what trusting and trustworthiness are, as is common in real life (e.g. making and repaying a loan). We believe that our design strongly encourages E to put herself in the situation of a person who has benefited from R's expectation that she will return £22. Despite being strangers, E is in the analogous position of the agent to R's principal.

## 4. The sample and survey methods

### 4.1. The sample

The sample frame was households who were formerly members of the BHPS; they were dropped from the panel for technical and funding reasons in 2001 and were reinterviewed in 2003 for

a special study (Jäckle *et al.*, 2004). We randomly selected one person from each household. An advance letter asking these people whether they would agree to participate explained that we would be ‘running an experiment on how people make simple financial decisions’ as well as asking questions from a short questionnaire similar to earlier questionnaires. An advantage of using a sample drawn from people who have participated in the BHPS for several years is that they are likely to believe that the field organization and the managers of the survey can be trusted to carry out the experiment and payments as they promise. Trust responses in a new survey are likely to be contaminated by varying degrees of trust in the organizers of the experiment, in addition to trust in their co-player. In addition, our subjects are used to receiving compensation (a voucher) for their participation.

#### 4.2. Procedures

The experiment was carried out first. It and subsequent interviews were done face to face by professional interviewers at the subject’s home. Interviewers were instructed to read only from the experimental script (see Appendix A) and not to elaborate further. If the subject had difficulty understanding, they were instructed to read that particular part of the script, or the whole script, again. At the conclusion of the full interview, interviewers were asked to report whether the subjects understood what they were being asked to do in the experiment. The vast majority (94% of Rs and 83% of Es) understood ‘easily’ or ‘very easily’. We randomly matched an E-player to each R who passed on the money.

We used the same survey organization that carries out the BHPS. As a consequence, many of the respondents knew the interviewer from previous contact through the BHPS. For example, 63% had the same interviewer as they had in the last year that they were interviewed (2003), and 31% had the same interviewer in 2003 and in the 2001 BHPS as well as in our experiment in 2007. On the one hand, this is an advantage because it reinforces trust that the experiment will be carried out as described. For example, Eckel and Wilson (2004) reported that a large proportion of subjects participating in a one-shot trust game did not believe that they were matched with a real person (page 458, footnote 9). On the other hand, knowing the interviewer may subconsciously incline subjects to trust or be trustworthy in the experiment, despite the fact that we reiterated several times in the interview script that the interviewer would not know the subject’s decision (see Appendix A). Those who had the same interviewer in 2001, 2003 and 2007 are more likely both to give £10 (51% compared with 40%) and to return £22 (57% compared with 46%), but the differences are not statistically significant ( $p$ -values of 0.18 and 0.36 respectively). Subjects who had the same interviewer in 2003 and 2007 differed in a similar direction, but again the differences are not sufficiently large to be significant.

#### 4.3. Survey structure

After completing the experiment, the respondents filled out a short confidential self-completion questionnaire on their own that followed up their decision. They then completed a questionnaire with the interviewer (a computer-assisted personal interview) and finally another confidential self-completion questionnaire containing the 12 questions from the general health questionnaire (GHQ), two questions about willingness to take risks (which had not previously been asked in the BHPS) and six questions for assessing two of the ‘big five’ personality traits—‘openness’ and ‘neuroticism’. The computer-assisted personal interview questionnaire allowed us to update some basic information, such as current employment, marital status, homeownership and financial situation, at the time of the experiment. On average, the experiment took 10 min and the remainder of the survey about 15 min.

**Table 1.** Comparison of trust survey and 2005 BHPS respondents<sup>†</sup>

<i>Variable</i>	<i>Mean, trust survey</i>	<i>Mean, 2005 BHPS</i>
Age (years)	53	48
Female	0.61	0.53
Homeowner (outright or mortgage)	0.44	0.77
In paid employment	0.46	0.56
Retired	0.32	0.25
Financial situation		
'Comfortable'	0.21	0.31
'Doing alright'	0.33	0.41
'Just about getting by'	0.32	0.22
'Finding it quite or very difficult'	0.14	0.06
Divorced or separated	0.19	0.10
Active in organization on regular basis	0.46	0.45

<sup>†</sup>BHPS weighted with cross-section weights for Great Britain.

#### 4.4. Survey response

In the first stage (i.e. Rs), 173 of 245 eligible cases were interviewed: a response rate of 71%. In the second stage (Es), 85 of 127 eligible cases were interviewed: a response rate of 67%. Apart from one refusal, all the non-responses arose because of inability to locate the individual selected. Since we know that the probability of moving in a particular year is inversely related to the length of current residence (e.g. Morrison (1971) for an early study and Belot and Ermisch (2006) for evidence from the BHPS), we checked whether non-response may have affected our inferences by relating the odds of giving the £10 (among Rs) and returning the £22 (among Es) to length of residence. We found no significant effects. Thus, it appears that those who move more often do not behave differently in terms of trust and trustworthiness.

#### 4.5. How representative is the sample?

Considering some key dimensions, relative to the 2005 BHPS (Table 1), our sample over-represents women, people who are retired, older, divorced or separated and those who describe their financial situation as 'just getting by' or 'difficult', whereas it under-represents homeowners and people whose financial circumstances make them feel that they are 'comfortable' or 'doing alright'. Being conservative, the sample can at least be taken as representative of households with low to moderate income. (The focus on lower income people may also have its serendipitous advantages because the sums of money that are involved in the experiment may be more important to them.) Analysis in Ermisch *et al.* (2007) strongly suggests that the percentages trusting and being trustworthy should be similar to those for a more representative sample of the population.

#### 4.6. External validity

Even if our results were perfectly representative of what the British population would do when participating in an experiment such as ours, it still does not follow that their behaviour in the experiment carries over to real life trust situations. Scrutiny by investigators in experiments may exaggerate pro-social behaviour relative to environments without such scrutiny. Absence of anonymity—whether between subjects or between subjects and interviewer (such as familiarity with interviewers which we discussed above)—tends to work in the same direction. In our experiment, we used procedures that ensured that interviewers did not know the partic-

**Table 2.** Means and standard deviations

<i>Variable</i>	<i>Mean (standard deviation)</i>	<i>N</i>
Give £10	0.429	170
Return £22	0.500	84
Age (years)	53.3 (16.9)	254
Female	0.61	254
Financial situation		
'Comfortable'	0.21	254
'Doing alright'	0.33	254
'Just about getting by'	0.32	254
'Finding it difficult'	0.14	254
Homeowner	0.44	254
Married or cohabiting	0.46	246
Widow(er)	0.16	246
Divorced or separated	0.19	246
Never married	0.19	246
Active in organization on regular basis	0.46	254
'Poor' mental health (GHQ caseness > 2)	0.31	224
Neurotic	0 (0.8)	222
Openness	0 (0.8)	221
Willingness to take risks in trusting strangers	3.4 (2.4)	234
General willingness to take risks	4.4 (2.6)	233
% who say 'most people can be trusted'	38	254

ipant's decision (e.g. sealed envelopes), and we clearly pointed this out to participants in the interview script (Appendix A). In addition, participants had no information at all about their counterparts, guaranteeing strict anonymity between subjects.

It has been suggested that, in games such as the trust game, financial concerns increase in prominence relative to pro-social behaviour as the stakes increase (Levitt and List, 2007). We did not vary the stakes, but our pay-offs are large compared with most other TGEs, in both laboratories or with representative samples. However, compared with experiments with samples in poor countries (Barr, 2003; Schechter, 2007), our stakes are relatively small. It is safe to say that inferences from our experiment may only be valid for real life trust situations with low to moderate stakes.

In so far as beliefs are based on experience, past experience is important for people's decisions in experiments. For example, the studies by Henrich *et al.* (2004), which used the so-called 'ultimatum game' with the same protocols (including pay-offs and description of the game) in 15 different small-scale communities, found that the past experiences and social norms that participants brought to the game influenced the outcomes. In the more technical language of Hoffman *et al.* (1996), page 655, '... subjects bring their ongoing repeated game experience and reputations from the world into the laboratory [the experiment]...'. Because our objective is to measure basic trust and trustworthiness in British society we want to tap into the experiences that subjects draw from real life trust situations. It is precisely their drawing on their social context that should give the experiment external validity. We believe that our design makes it highly likely that Es' decisions reflect their habitual practices in these situations—their sense of



**Table 3.** Logistic regression for the log-odds of trusting (column (1)) and trustworthiness (column (2))†

<i>Variable</i>	(1), <i>trust</i> (give £10)	(2), <i>trustworthiness</i> (return £22)
Age	0.038‡ (0.012)	−0.014 (0.025)
Female	0.17 (0.28)	−0.03 (0.53)
Financial situation (reference, 'Comfortable')		
'Doing alright'	−1.29‡ (0.60)	−0.66 (0.62)
'Just about getting by'	−1.06§ (0.61)	−1.24§ (0.72)
'Finding it difficult'	−0.21 (0.78)	−1.84‡ (0.76)
Homeowner	0.62§ (0.34)	0.51 (0.62)
Marital status (reference, married or cohabiting)		
Widow(er)	−0.50 (0.53)	1.21 (0.90)
Divorced or separated	0.93‡ (0.44)	1.92‡ (0.88)
Never married	0.45 (0.49)	0.25 (0.47)
Active in organization on regular basis	0.59§ (0.30)	0.35 (0.55)
Constant	−1.984	1.099
<i>N</i>	166	80
Wald $\chi^2(10)$	47.67	53.26
<i>p</i> -value	0.0000	0.0000

†Standard errors are given in parentheses, corrected for clustering on the interviewer.

‡Statistically different from 0 at the 0.05 level.

§Significantly different from 0 at the 0.10 level.

reciprocity, fairness or sensitivity to obligations—and the Rs' decisions reflect their expectation of such behaviour. (Laboratory experiments by McCabe *et al.* (2003) using binary trust games similar to that used here, in which R's expectation is known to E, suggest that E's attribution of intentions to R is important in E's decision to fulfil trust or not.)

## 5. Experimental outcomes

Our basic figures are that 43% of Rs passed on £10 ('trusted'), and 50% of Es returned the specified £22 (were 'trustworthy'). These should give us a snapshot of the level of basic trust and trustworthiness in British society in simple trust situations involving strangers, in which stakes are relatively low and E knows that R's decision was taken on the expectation that £22 would be returned.

After the Rs had made their decision and inserted it in the sealed envelope, the interviewer gave the participant a short sheet of questions concerning how they made their decision. These were filled out in private and put in another sealed envelope so that the interviewer did not know

**Table 4.** Logistic regression for the log-odds of trusting in the experiment (column (1)) and in the survey question (column (2))†

<i>Variable</i>	(1), <i>experiment</i> (give £10)	(2), <i>survey question</i> (say 'most people can be trusted')
Age	0.033‡ (0.012)	-0.003 (0.008)
Female	0.38 (0.34)	-0.41 (0.30)
Financial situation (reference, 'Comfortable' or 'Finding it difficult')		
'Doing alright' or 'Just about getting by'	-1.24‡ (0.43)	-0.14 (0.31)
Homeowner	0.82‡ (0.34)	0.25 (0.36)
Marital status (reference, married or cohabiting or widow(er))		
Divorced or separated or never married	1.00‡ (0.34)	0.35 (0.29)
Active in organization on regular basis	0.37 (0.35)	-0.08 (0.40)
Openness	-0.18 (0.18)	0.53‡ (0.23)
Neuroticism	0.15 (0.26)	-0.58‡ (0.22)
'Poor' mental health (GHQ caseness > 2)	-0.81§ (0.42)	-0.64‡ (0.32)
Constant	-2.512	0.187
<i>N</i>	147	215
Wald $\chi^2(9)$	46.11	47.83
<i>p</i> -value	0.0000	0.0000

†Standard errors are given in parentheses, corrected for clustering on the interviewer.

‡Statistically different from 0 at the 0.05 level.

§Significantly different from 0 at the 0.10 level.

how subjects replied. The first question was 'When you made your decision about whether to give £10, did you weigh up the chances of getting your money back?'. Nearly 80% of Rs answered 'yes'. This is reassuring for our measure of trust because 'trust' is by nature an expectation (Gambetta, 1988; Barr, 2003) and entails a self-interested aim to gain more if trust is fulfilled.

We now consider how the decisions in the experiment vary with personal characteristics. Table 2 provides descriptive statistics for the variables, and Table 3 presents logistic regressions for the odds that Rs give £10 and the odds that Es return £22. The regressions suggest that Rs are more likely to trust if they are older, are a homeowner, are active in an organization or are divorced or separated rather than married or cohabiting. (A potential problem with inclusion of the organization variable is that those who are more disposed to trust may be more likely to be active in organizations.) Those who describe their financial situation as 'doing alright' or 'just about getting by' are less likely to trust than those who are 'comfortable' or 'finding it very difficult', suggesting a U-shaped relation between trust and financial situation. The former may feel sufficiently comfortable to risk £10, whereas the latter may feel so poor that they may just as well risk £10 in the hope of gaining £22.

Es are less likely to be trustworthy if they find their financial situation is 'difficult' or they are 'just about getting by', suggesting that trustworthiness may be a 'luxury' that some cannot

afford. Es are more likely to be trustworthy if they are divorced or separated rather than married or cohabiting.

In studying the effect of other personal attributes on trusting, because of our small sample size, we try to economize on parameters by imposing two sets of statistically acceptable restrictions. One is the reference group for financial situation that includes those who are 'comfortable' and 'finding it difficult', whom we find to be more trusting, as opposed to those 'doing alright' and 'just about getting by', whom we find to be less trusting. The other is that the reference group for marital status contains the widowed along with those cohabiting or married, and these are compared with the divorced, separated or never married. This simplification is justifiable for we find that being a widow(er) does not make a significant difference for trust relative to being married or cohabiting, whereas its effect on trust is significantly different from being divorced or separated ( $p=0.01$ ) and nearly significantly different from being never married ( $p=0.11$ ). In addition, the never married are not significantly different in their trusting behaviour from the divorced or separated. (On either an Akaike or Bayesian information criterion, this restricted model for trusting dominates the model in Table 3, and also other restricted models that are acceptable on a likelihood ratio test criterion.)

In the first column of Table 4, we introduce three new variables compared with Table 3. These are factor scores for two of the 'big five' personality traits—'openness' and 'neuroticism'—and the third is an indicator of mental health—scoring 3 or more on the 12-point 'caseness' indicator taken from the GHQ questionnaire. There is no evidence that these personality traits affect trust, but those in poorer mental health are less likely to trust. The other variables have effects that are similar to those in Table 3, although the effect of regular activity in an organization is smaller and no longer statistically significant. None of these three additional variables affect the odds of being trustworthy (the results are not shown).

Comparisons with the previous two studies using representative population samples (Fehr *et al.*, 2002; Bellemare and Kroeger, 2007) are limited by different dependent variables (amounts sent and returned rather than 'trust or not' and 'be trustworthy or not'), use of the 'strategy method' by Bellemare and Kroeger (2007) for studying trustee behaviour (a statement of the amount that they would return for all 11 possible amounts that they could receive) and different covariates included in the analyses (e.g. questions about subjective beliefs about the behaviour of other players but not marital status or mental health). Within these limitations, there are some similarities and differences with our results. In contrast with Bellemare and Kroeger (2007), we do not find a U-shaped age effect for trust behaviour, but rather we find trust increasing with age (in the neighbourhood of the mean age in our sample, Bellemare and Kroeger (2007) found amounts sent declining with age). We use a person's own perception of their financial circumstances rather than *personal income*, and we allow for and find a U-shaped effect of financial circumstances on trust. The other two studies did not make this allowance and found an insignificant income effect. Bellemare and Kroeger (2007) found that women send more money, and we also find that women are more likely to trust, but the effect is not statistically significant, unless we control for risk preferences (Table 8 in Section 7).

## 6. Survey questions *versus* behavioural measures

Could have we dispensed with the experiment, at least for measuring trusting behaviour, by just using the common question about trust—'Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?'—which has been run in the BHPS and many other surveys? Table 5 shows that this question has absolutely no predictive power for people's trusting behaviour as measured in our experiment. It weakly

**Table 5.** Attitudinal questions in the survey and trust and trustworthiness in the experiment

<i>Behaviour</i>	<i>Most people can be trusted</i>	<i>Cannot be too careful</i>	<i>Other; depends</i>	<i>p-value</i>
% of Rs giving £10	43.1%	42.7%	44.4%	0.995
Column <i>N</i> (= 100%)	58	103	9	
% of Es returning £22	55.3%	43.6%	57.1%	0.547
Column <i>N</i> (= 100%)	38	39	7	

suggests, however, that those who answer that most people can be trusted are more likely to be *trustworthy* in the experiment. Although the differences are not significant for the Es either, the pattern of results matches the findings by Glaeser *et al.* (2000) and Sapienza *et al.* (2007). This suggests that some of those who say that others are mostly to be trusted may be inferring from, as it were, a sample of 1, namely from their own behavioural inclinations. This result matches other experimental findings. ('In a succession of experimental studies exploring the circumstances surrounding cooperation in n-person prisoner's dilemmas, we have collected data about subjects' expectations of others' behaviour. One of our most consistent findings throughout these studies—a finding replicated by others' work—is that *cooperators expect significantly more cooperation than do defectors*. . . . [there are further] findings consistent with expectations being dependent on the actor's own behaviour . . . ' (our emphasis; Orbell and Dawes (1991), page 519)). In particular, Schechter (2007), page 281, found that

'the share the player returns to the trustor when playing the role of trustee is highly correlated with the amount he sends to the trustee when playing the role of trustor'.

In the second column of Table 4, we use the same variables to account for variation in trust measured by the positive response ('most people can be trusted') to the survey question. As in Bellemare and Kroeger (2007), the differences are remarkable. The variables that did well in predicting trust by using the behavioural measure in the first column are not statistically significant, and people who are more open and less neurotic appear more likely to trust according to the survey measure. The only similarity is in the effect of poor mental health. Thus, it appears that the survey question is not helpful in analysing how trust varies within the population.

Laboratory evidence from University of Chicago Master of Business Administration students provided by Sapienza *et al.* (2007) suggests that the standard survey question reflects only people's expectations about others' trustworthiness. We can test this hypothesis with our data by using the follow-up questions after Rs had made their decision. The 80% of Rs who said that they had weighed the chances of getting their money back were asked the follow-up question 'What did you think your chances of getting your money back were?'. The first row of Table 6 shows that those who were more optimistic about receiving £22 in return were more likely to say that 'most people can be trusted', suggesting that the survey question captures to some extent the expectations component of trust decisions.

The second row of Table 6 indicates that the person's expectation of the chances of return is strongly related to their experimental trust decision, with more optimistic Rs being consistently more likely to trust, which is also reassuring for our trust measure. Nevertheless, the failure of the survey question to predict trusting behaviour in the experiment that is evident in Table 5 indicates that there is either insufficient content about expectations in the survey question, or that there is another dimension that plays an important role in addition to expectations or both.

**Table 6.** Expected chances of return and trust in both the experiment and the survey

<i>Behaviour</i>	<i>Less than 50–50</i>	<i>50–50</i>	<i>More than 50–50</i>	<i>p-value</i>
% of Rs who say 'most people can be trusted'	27.8%	39.6%	80%	0.036
Column <i>N</i> (= 100%)	72	52	5	
% of Rs giving £10	23.2%	69.2%	80%	0.000
Column <i>N</i> (= 100%)	72	52	5	

This second dimension could be the disposition or preference that individuals have to take risks, namely to allow themselves to be exposed to the potential opportunism of others.

## 7. Risk preferences and trust

Few studies have studied the effect of attitudes to risk on trust, despite the fact that the trust decision is basically a bet on the trustworthiness of a stranger (e.g. Eckel and Wilson (2004) and Schechter (2007)). The first risk-related question that we asked is 'Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? Please tick a box on the scale, where 0 means "unwilling to take risks" and the value 10 means "fully prepared to take risks".' This is the same question as was asked in the 2004 wave of the German Socio-economic Panel. Dohmen *et al.* (2005) conducted a complementary field experiment and found that this measure is a good predictor of actual risk taking behaviour. The second question also comes from the German Socio-economic Panel. It asks about willingness to take risks not in general but in *trusting strangers*, again on an 11-point scale.

Our risk measures show that, similarly to the German data, the two risk scales are correlated ( $r = 0.46$ ), but respondents are less willing to take risks in trusting strangers than they are willing to take risks in general. This is evidence that, when the outcome depends on other people's decisions, risk is perceived differently from the risk of losing in a game of chance or in the stock market and may reflect 'exploitation' or 'betrayal' aversion (Bohnet and Zeckhauser, 2004; Bohnet *et al.*, 2008).

We test whether the 11-point 'willingness to take risks' scales affect trust and trustworthiness. There was no evidence that 'general willingness to take risks' affected trust behaviour, a result that is consistent with Eckel and Wilson (2004), but not with Sapienza *et al.* (2007) or Schechter (2007). By contrast, Rs who express more willingness to take risks *in trusting strangers* were both more likely to respond that 'most people can be trusted' in the survey (second row of Table 7) and

**Table 7.** Willingness to take risks in trusting strangers and trust in both the experiment and the survey

<i>Behaviour</i>	<i>Scale 0–5</i>	<i>Scale 6–10</i>	<i>p-value</i>
% of Rs giving £10	38.3%	54.8%	0.093
Column <i>N</i> (= 100%)	128	31	
% who say 'most people can be trusted'	28.1%	64.5%	0.000
Column <i>N</i> (= 100%)	128	31	

**Table 8.** Logistic regression for the log-odds of trusting in the experiment (column (1)) and in the survey question (column (2))†

<i>Variable</i>	<i>(1), experiment (give £10)</i>	<i>(2), survey question (say 'most people can be trusted')</i>
Age	0.048‡ (0.015)	0.017 (0.012)
Female	0.58§ (0.33)	-0.41 (0.29)
Financial situation (reference, 'Comfortable' or 'Finding it difficult') 'Doing alright' or 'Just about getting by'	-1.27‡ (0.43)	-0.13 (0.35)
Homeowner	0.91‡ (0.33)	0.31 (0.39)
Marital status (reference, married, or cohabiting, or widow(er)) Divorced, or separated or never married	0.88‡ (0.33)	0.40 (0.38)
Active in organization on regular basis	0.52 (0.35)	-0.26 (0.41)
Openness	-0.32 (0.22)	0.39 (0.28)
Neuroticism	0.24 (0.28)	-0.49§ (0.29)
'Poor' mental health (GHQ caseness > 2)	-0.93‡ (0.46)	-0.55 (0.35)
Willingness to take risks in trusting strangers	0.21§ (0.12)	0.45‡ (0.08)
Constant	-3.999	-2.656
<i>N</i>	143	211
Wald $\chi^2(10)$	42.44	63.67
<i>p</i> -value	0.0000	0.0000

†Standard errors are given in parentheses, corrected for clustering on the interviewer.

‡Statistically different from 0 at the 0.05 level.

§Significantly different from 0 at the 0.10 level.

to pass on the £10 in the experiment (first row of Table 7). Thus, there appears to be some behavioural content in this question. Nevertheless, if we use the dichotomous risk variable in Table 7 to predict whether people trust in the experiment, we would still be wrong for 38% of the cases who are 'risk averse' according to this measure (scale 0–5) and, for those who are not risk averse, we would be wrong for 45% of the cases. Overall, we would be wrong for 40% of the subjects.

In Table 8, we test further whether the full 0–10-scale for willingness to take risks in trusting strangers affects trust as measured by either the experiment or the survey question. In the first column, it is positively related to the experimental trust measure. Because this risk scale is negatively related to age and being female, but not significantly related to the other explanatory variables, there is an increase in the age effect and in the influence of being female on the odds of trusting relative to Table 4. The effect of the risk willingness scale on the survey trust response in the second column is large, and its inclusion reduces the effect of the personality traits, because more open people are more willing to take risks in trusting strangers and more neurotic individuals are less willing. This strong effect suggests that, contrary to Sapienza *et al.* (2007), the survey trust question contains information not only about expectations, but also willingness to take risks in trusting strangers. Indeed, risk aversion in trusting strangers significantly predicts

responses to the survey question *within* each of the two main expectations groups: 25% compared with 60% ('less than 50–50') and 35% compared with 69% ('50–50 or more'). Despite this direct relationship between the risk willingness indicator and a positive response to the survey question, the latter does not predict experimental trust well, because within each risk group of Table 7, for nearly half of the subjects, their survey response contradicts their experimental behaviour.

We conclude that behavioural responses to experiments like that carried out here provide measures of trust and trustworthiness, which are both reliable and superior to the common survey questions regarding trust. The cost of running these experiments is low relative to the cost of making contact with participants. Thus, the marginal costs of these measures are low when a representative survey is being undertaken for other purposes. Our results also suggest that a question that is concerned with willingness to take risks in trusting strangers is a rough but cheap way to monitor changes in propensity to trust (but not trustworthiness) over time in repeated surveys.

## 8. Conclusions

Overall, 43% of people were willing to trust a stranger in our experiment, and their trust was rewarded half of the time. Analysis of variation in the trust behaviour in our survey suggests that trust increases with age, although we cannot rule out a generational effect. Also, people who are homeowners are more likely to trust, whereas those in poorer mental health are less likely. Surprisingly, both people whose financial situation is 'comfortable' and those who are 'finding it difficult' are more likely to trust. Trustworthiness is less likely if a person's financial situation is perceived by them as 'just getting by' or 'difficult', suggesting that trustworthiness towards strangers is a 'luxury' that some people cannot 'afford'.

People who are divorced or separated are both more likely to trust and more likely to be trustworthy compared with those who are married or cohabiting. There is also weaker evidence that people who never married are more likely to trust than people who are married or cohabiting. These results for trust may reflect greater incentives for people not living with a partner to interact with strangers and as a result also more experience in doing so. More experience promotes trust if their experiences are predominantly positive because their expectation that people will be trustworthy is higher. Our experimental result that half of trustees are trustworthy even with completely anonymous partners is broadly consistent with the assumption that trust in strangers is more likely to be rewarded than not in British society, because in most day-to-day transactions trusters and trustees have some information about each other, and certainly more than they have in our experiment.

Should the experiment be carried out repeatedly in panel surveys like the BHPS and the new UK Household Longitudinal Study? Although the case is not entirely straightforward, we think that there are very good reasons for doing so. The potential problem that is inherent in panel repetition is that subjects might start to treat the experiment as a 'game' rather than tapping into their experiences from real life trust situations in one-shot games. However, it might be interesting to study how Rs' decisions in subsequent rounds are affected by having trust rewarded or violated, although it would remain unclear how to make inferences about real life trust situations from this behaviour. Panel repetition can also be valuable for assessing causal influences as it can allow for unobserved individual heterogeneity as well as dynamics.

One way that we could use experiments in panel surveys to monitor changes in trust behaviour over time, while avoiding the potential problem arising from panel repetition, is to run the experiment on different small subsets of the panel sample each year. In other words, create a series of repeated cross-sections from within the panel. This would also be relatively cheap because the payment arrangements (cash and cheques) need only to be set up for this subsample

each year. Having repeated measures of trusting and trustworthiness would give us a simple yet precise sense of the relative health of social relations in the country.

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### Appendix A: Experiment script

#### LIVING IN BRITAIN

#### SPRING 2007

#### QUESTIONNAIRE

D0a. DATE OF INTERVIEW

DAY		MONTH		YEAR			
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

#### FOR INTERVIEWER REFERENCE

(T1 = 0 & T2 = 0)

"This respondent is ineligible for interview."

(T1 = 1 & T2 = 1)

"This is a first-stage respondent. You will be using **PINK** coloured materials for this respondent.

Please ensure that this respondent has received the card with the **£10 note**. Before you start, make sure the respondent has opened it and seen the money."

(T1 = 1 & T2 = 2)

"This is a first-stage respondent. You will be using **PINK** coloured materials for this respondent.

Please ensure that this respondent has received the card with the **£10 note and £2 coin**. Before you start, make sure the respondent has opened it and seen the money."

(T1 = 2)

"This is a second-stage respondent. You will be using the **CREAM** coloured materials for this respondent.

Please hand over the two checks for £40 and £18 at the appropriate point in the experiment."

#### THE FOLLOWING STATEMENT MUST BE READ TO ALL RESPONDENTS:

**This interview is completely voluntary -- if we should come to any question that you don't want to answer, just let me know and we'll go on to the next question.**



## For R-subjects

**SC1 CHECK**  
**IF T1 = 1 & T2 = 1 GO TO SC1 (£10 OPTIONS)**  
**ELSE IF T1 = 1 & T2 = 2 GO TO SC1 (£12 OPTIONS)**  
**ELSE IF T1 = 2 GO TO SC5**

**SC1 INTERVIEWER NOTE**  
**THIS RESPONDENT SHOULD HAVE RECEIVED {£10} (IF T2 = 1) / {£12} (IF T2 = 2) IN CASH.**  
**PLEASE MAKE SURE YOU HAVE HANDED OVER THE CARD WITH THE {£10 NOTE} (IF T2 = 1) {£10 NOTE PLUS £2 COIN} (IF T2 = 2) BEFORE YOU START AND MAKE SURE THE RESPONDENT HAS OPENED IT AND SEEN THE MONEY**

### READ OUT

As you know, we are running an experiment on how people make simple financial decisions. In this experiment we randomly matched you with another person. The other person does not know your identity or anything about you and I know nothing about the other person. I will have no contact with this person. They will be interviewed by another interviewer following your interview.

Let's start by explaining a bit more about the experiment and the choice you need to make. We have given you {£10} (if T2 = 1) / {£12} (if T2 = 2). This money is yours to keep as a "Thank you" for participating in this survey. In this experiment, however, we are giving you the opportunity to give {this £10} (if T2 = 1) / {£10 of this} (if T2 = 2) to the person we have randomly matched you with. If you give {£10} (if T2 = 1) / {£10 of this} (if T2 = 2) to the person we matched you with, we will add £30, so that the other person receives £40. We will then ask them to decide

whether to return £22 of this to you and keep £18,

OR

whether to keep the £40

The other person is absolutely free to choose either option.

Your decision needs to be made in private so please do not tell me now, even if you know immediately what you are going to do. I will never know what you decided.

### HAND LAMINATED SHOWCARD SIDE 1 TO RESPONDENT

#### READ OUT

You must decide whether or not to give £10 to the other person.

If you decide **not to give the £10**, your participation in the experiment ends. We will just finish off the rest of the interview.

If you decide to give the £10, you may receive £22 back, or nothing. You will find out about the other person's decision and receive payment, if any, in about four weeks.

In this experiment both you and the other person are free to decide what you want to do. There is no 'correct' decision.

CONTINUE

**SC2 HAND THE RESPONDENT THE ENVELOPE AND ASK THEM TO TURN OVER THE LAMINATED CARD TO SIDE 2 FOR THE INSTRUCTIONS****READ OUT**

If you decide NOT to give the £10 to the other person, you should put the empty card in the envelope.

If you decide to give the £10 to the other person, put the £10 note inside the card and put it in the envelope.

Please seal the envelope before you hand it back to me. Someone else will open the envelope and I will never know your decision.

Can you please make your decision now. I will leave the room / turn my back so you can make your choice in private. Please take as long as you need to make your decision.

**Interviewer code:**

Envelope with card returned

**SC3 ONCE THE RESPONDENT HAS HANDED BACK THE SEALED ENVELOPE WITH THE CARD PASS THEM THE SINGLE PINK PAGE SELF-COMPLETION QUESTIONNAIRE TO COMPLETE TOGETHER WITH ANOTHER ENVELOPE****READ OUT**

We would next like you to answer a few questions concerning your decision. Can you please complete the questions on the sheet and then seal it in the envelope before you hand it back to me. I will turn my back again so that you can complete the questions in private.

**Interviewer code:**

Questionnaire returned

**SC4 READ OUT**

Thank-you. We will process your decision and, if you gave £10 and the person we paired you with returns £22, we will send you a cheque for £22. In any case, we will notify you about the outcome. This should take about four weeks.

That is the end of the experiment but I just have a few other questions I'd like to ask you. This will take only 5 or 10 minutes.

CONTINUE

**GO TO H0**

**For E-subjects**SC5 **READ OUT**

As you know, we are running an experiment on how people make simple financial decisions. In this experiment we randomly matched you with another person. The other person does not know your identity or anything about you. I myself have had no contact with this person. They have already been interviewed by another interviewer.

Let's start by explaining a bit more about the experiment and the choices you can make about what to do with £40. This £40 has been made available to you because of the decision made by the other person when they were interviewed. This is what has happened so far.

The other person received {£10} (IF T2 = 1) / {£12} (IF T2 = 2) from us for taking part in the experiment.

We told them that they would have the opportunity to receive £22 if they chose to give you £10. They were told that if they gave you £10, we would add £30 to make £40, which is the amount you now have available.

The other person made their decision knowing that you would be asked to decide whether to keep £18 and return £22 to them or keep all £40.

They decided to give you the £10 knowing this was the choice you would be making.

Your decision needs to be made in private so please do not tell me now, even if you know immediately what you are going to do. I will never know what you decided.

**HAND OVER THE CREAM SHOWCARD SIDE 1  
READ OUT**

We now ask you to decide whether you want to ...

Keep the £40  
OR  
Keep the £18 and return £22

Let me stress that you are absolutely free to choose either option and that the other person knew you would be free to choose. There is no 'correct' decision.

CONTINUE

**SC6 HAND THE RESPONDENT THE ENVELOPE WITH THE CHEQUES AND ASK TO OPEN  
ASK TO REFER TO THE CREAM SHOWCARD SIDE 2  
HAND THE RESPONDENT THE CREAM DECISION CARD AND ENVELOPE**

**READ OUT**

Here are two cheques made out to you, one for £18 and the other for £40.

Can you look at this card and decide whether you want to keep £40 OR keep £18 and return £22 to the person who made the £40 available to you.

Put both the card with your decision and cheque in the envelope and seal it before handing it back to me. Someone else will open the envelope and I will never know your decision.

Let me stress again that you are absolutely free to choose either option. There is no 'correct' decision.

So that you can make your decision in private, I will leave the room/turn my back. Please take as long as you need to make your decision.

**Interviewer code:**

Envelope with card returned

**SC7 ONCE THE RESPONDENT HAS HANDED BACK THE SEALED ENVELOPE WITH THE DECISION CARD PASS THEM THE SINGLE CREAM COLOURED SELF-COMPLETION QUESTIONNAIRE TOGETHER WITH ANOTHER ENVELOPE**

**READ OUT**

Next, we would like you to answer a few questions. Can you please complete the questions on this sheet, then seal it in the envelope before you hand it back to me. I will turn my back again so that you can complete the questions in private.

**Interviewer code:**

Questionnaire returned

**SC8 READ OUT**

Thank-you. You can cash the cheque that you kept immediately.

That is the end of the experiment but I just have a few other questions I'd like to ask you. This will take only 5 or 10 minutes.

CONTINUE  **GO TO H0**

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