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The trustworthiness of trust measurement

Predicting trusting behaviour in trust games by survey-measured trust

Bachelor thesis sociology

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Abstract

Trust has found to be of great influence on social and economic transactions of everyday life (Fehr, 2009). Although the topic has caught the attention of scholars within many fields, the question how trust can be measured has not been answered properly (Nannestad, 2008). Previous studies have shown that the main measurement methods of trust – the survey based generalized trust question and the experimental trust game – do not correlate (Ermisch et al., 2009; Fehr et al., Glaeser et al., 2000). Data and methods on which these results are based can be fairly criticized. I hypothesise that survey-based trust can predict trusting behaviour in trust games. In this study, generalized trust is perceived by the behaviouristic definition. I argue that measurement on generalized trust can be improved by using a homogeneous sample, by using a random and anonymous matching procedure in the experiment and by creating a survey-measure, formed by a multiple-item trust scale. The data consists of experiments from Switzerland (2010 and 2014), the United Kingdom (2011) and Spain (2012), including both trust game and survey. I conclude that survey-measured trust, when used in a multiple-item scale, successfully predicts trusting behaviour in trust games.

Key-words: *trust, measurement, trust games, experiment, survey*

1 Introduction

Do you think, generally speaking, that people can be trusted? Or that you cannot be careful enough in dealing with others? What would your answer be?

With reason and rationality each of us can argue both to trust, as to be careful. However, it would be interesting to know how you would behave in a situation where your preparedness to trust would be tested. What you would do if you would be in need to ask a stranger to watch your child for a moment. How you would react when someone, queued in front of you in the supermarket, would ask you to lend him some money, because unfortunate as it is, he happens to have forgotten his wallet. "Trust me, the money will be transferred to you as soon as I am home". To trust or not to trust – it is a fair question.

Whenever people interact with one another, trust has proven to be a determining factor for the functioning and the value of any form of exchange, whether it takes place in an anonymous or familiar way, in person or as part of a group (Cook, 2001). Trust can be seen as a binding factor within society and its members (Putnam, 2000) and can even be considered as a key variable of the efficiency and success of a democracy and a welfare state (Cook, 2001; Putnam et al.,1994; Putnam, 2000). It is the element of trust which cuts off the needs for complicated formal rules, contracts and other costly forms of control and security. It makes transaction costs in contact with others smaller or sometimes even unnecessary. This way, high trust levels have proven to stimulate economic growth and social well-being within a society (Zak & Knack, 2001).

Therefore, trust has drawn the attention of many sociologists, psychologists, political scientists and economists throughout history, who have desired to take a closer look and fill in the blanks on questions regarding the trust issue (Miller & Mitamura, 2003; Cook, 2001). Scholars have focused on trust, with the goal to create an image of which role trust takes in social phenomena, to learn what factors lead to higher trust and how we can influence trust with regard to the improvement of governmental efficiency and economic growth (Ashraf et al., 2006; Cook, 2001; Putnam at al., 1994; Zak & Knack, 2001).

To measure generalized trust, two main measurement methods have been dominating the field of research: the survey and the experiment (Nannestad, 2008; Uslaner, 2016). Many surveys which aim to measure generalized trust contain the so-called 'trust question', formulated

similarly to the questions presented to you at the start of this article. This survey item, which found its origin in the General Social Surveys (GSS), has become known a common expression in the social sciences. The second measurement tool is the experimental method of trust games, which holds the possibility to purely measure trust under strictly controlled conditions (Nannestad, 2008).

If both measurement tools would measure trust in its exact form, their outcome would be fully comparable. However, studies which use both measurements tools have shown that these two methods result in conflicting outcomes, results which do not overlap completely or in some cases not at all, suggesting that either one or both of these tools contain a form of bias or measure different things than we thought they would (Ashraf et al., 2006; Eckel & Wilson, 2004; Glaeser et al., 2000; Fehr et al., 2002; Fehr, 2009; Ermisch et al., 2009, Nannestad, 2008). In other words, it is quite likely that your answer to the question, proposed at the start of the article, does not completely predict how you behave in the situations as have been described above. Intentions do not necessarily meet behaviour. Which trust measurement tool can we actually trust, what do we really measure with these tools and how do these results relate to each other, are all struggles which – so far – have not found a clear answer. This leads to the conclusion that the measurement problem with regard to generalized trust has not yet been solved (Nannestad, 2008; Reeskens & Hooghe, 2008).

The aim of the article is to shed light on this problem by offering a methodological contribution to the existing literature. On the basis of combined data from Switzerland, Spain and the United Kingdom, consisting of both survey-data including the trust question and experimental data including trust games, there will be searched for an answer to the question: *To what extent is survey-measured trust a valid predictor for trusting behaviour in trust games?*

To understand the methodological character of the subject, it is crucial to understand the concept of trust. In the following chapter, trust will be further explained within its theoretical framework as described by today's literature. In doing so, explaining its value to society and its interest to the social sciences. Because of the methodological focus of this article, the theory section will be followed by an examination of the main measurement methods of trust, describing its qualities and its flaws, from which the hypothesis will be derived. The method section holds a description and analysis of the data, followed by the presentation of its results based on which an answer is sought to be given to the proposed research question.

2 Trust in its theoretical framework

In our social interactions of everyday life, we make transactions of many kinds. Transactions with values in terms of emotion, goods and money (Yamagishi & Yamagishi, 1994). We want these transactions to be as smooth and cost-free as possible. We want our friends to handle our secrets with care, our baker to sell us good bread for a fair price, our neighbours to pay taxes just as we do too and our politicians to support us because we gave them our vote. We want the best and to be treated fairly. However, a guarantee often does not exist or has its costs in terms of effort or money (Ermisch et al., 2009; Zak & Knack, 2001). Social interactions with its constant flow of transactions, therefore, do not go without a certain degree of social uncertainty: a state in which an actor is not fully capable of detecting the incentives and motives of the other to cooperate. Social uncertainty is the reason trust exists (Yamagishi & Yamagishi, 1994).

Many scholars, with different scientific backgrounds, have focused on the question how we would, in fact, define trust. Trust, which is an appealing and interesting topic in the light of many sciences, has been viewed from many perspectives and has therefore been given many faces. Nannestad (2008) describes how trust can be seen as an action, an attitude, a choice, a relationship or a form of social capital and even how it could be perceived as the result of evolution or a chemical reaction of the brain. It is interesting to see that the concept of trust has not come to a universal definition, but holds many variations and approaches (Fehr, 2009).

Yamagishi and Yamagishi (1994) give a cognitive approach to the concept of trust by describing trust as a bias that arises when an actor engages in a transaction with someone without complete information giving the security that the other will act in a cooperative manner. Trust can contain the expectation that the other party is competent in fulfilling the promised action, though this should be called confidence. Trust in a more pure form is considered as the believed intention and goodwill of the other to fulfil a promise. This belief is merely based on what we think we know, because we often do not have the full body of information about the intentions of the other party. Hence, trust is seen as a positive estimation of these intentions and can be perceived as an overestimation of the situation (Yamagishi & Yamagishi, 1994).

To further explore and specify the rational vision on trust, Hardin (2004) visualizes trust as a triangular relation where A trusts B to do X. Trust is founded on the idea that, on top of the expectation of someone's behaviour, B has an incentive be trustworthy if possible. This makes

trust an encapsulation of this incentive. The source of this incentive can be of many kinds, like love or friendship, a show of respect or moral reasoning. The incentive Hardin (2004) aims at is an incentive for trust itself, meaning: being trustworthy in the interest of the trustor, not the trustee. In other words: B is driven to cooperate in interest of A, because of his affection for A and not because of his own interest. Based on this knowledge, A can trust B. In contrast, knowledge about the likelihood of B's cooperation based on B's own interest – a gun pressed to his head – would be knowledge based on assurance (Hardin, 2004).

Yamagishi and Yamagishi (1994) emphasize the importance of the distinction between the of concept trust and assurance. Assurance is, in contrast to trust, driven by incentives based on structural motives formed by the other's surroundings or the existing relationship. Motives like losing a reputation or breaking a fruitful social interaction. These motives assure one will not break a promise, but handling on this assurance cannot be seen as trust. Hence, trust can only exist when there is a form of social uncertainty. When assurance grows, social uncertainty decreases and trust becomes less needed. Assurance is, besides the element of trust, a way to cope with social uncertainty (Yamagishi & Yamagishi, 1994).

It is because of the existence of social uncertainty, that trust is said to be a crucial element for the well-being of society – both on macro- as on micro-level – to bridge the insecurity problems that we face and to find a balance between engaging in valuable interactions and risky transactions (Yamagishi & Yamagishi, 1994). This way trust is considered to be an important predictor for interpersonal and group behaviour, with influences on many levels of society (Ermisch et al., 2009; Hosmer, 1995).

Regarding the economic aspect of society, high levels of trust compensate for high transaction cost. Trust hereby smoothens economic relations and increases the likelihood that people take risks for opportunities, like investments. Reversed, a lack of trust goes hand in hand with a low investment rate, more effort spent in finding a suitable broker and creating the need of assurance through costly contracts. For this reason, a lack of trust can hold back on economic growth. Studies have shown that trust has an influence on inflation, international trading and a country's Gross Domestic Product (Fehr, 2009). We can see that a trustful environment forms a fundamental basis for a successful economy (Zak & Knack, 2001).

Putnam (1993) describes trust as an important element of social capital, stating that higher generalized trust stimulates participation in social and civic organizations, which in turn increases

social capital. Simultaneously, social capital – through social and civic engagement – stimulates generalized trust, positioning trust, social capital and civic engagement in a virtuous circle (Putnam, 1993). Being part of an association stimulates cooperation, shared goals and a sense of responsibility among its members, increasing a feeling of belonging and community and generating trust in the in-group (Putnam, 1995). Moreover, trust in the in-group, might also create a form of trust that can be generalized to the population as a whole (Stolle, 1998). Generalized trust and civic engagement are needed for a welfare state to function. Because civic engagement stimulates government efficiency, generalized trust is an element which has a positive effect on the success of democracy (Putnam, 1993).

However, this idea might be too optimistic and has been given its fair amount of critique. The positive effect of trust would mostly apply to homogeneous societies holding low segregation, with respect to ethnical, social and economic diversity (Fehr, 2009; Reeskens & Hooghe, 2008; Zak & Knack, 2001). Engagement in social groups may only increase trust within its own group, also known as group-trust (Foddy et al, 2009). In highly segregated societies trust might increase within specific groups, while the overall level of trust does not. This might even lead to negative feelings and distrust towards others, giving no stimuli for a higher governmental efficiency (Knack, 2003). Group-based trust can divided in two types: stereotype-based and expectation-based trust. The first is based on a positive evaluation of group members, who are assumed to have more favourable characteristics than the out-group, like being helpful, generous and trustworthy. The second type, expectation-based trust, is a form of trust based on the expectation that people from their own group would treat them relatively better than people from the out-group (Foddy et al., 2009).

Group-based trust is closely related to knowledge-based trust as described by Yamagishi and Yamagishi (1994), and encapsulated trust, as described by Hardin (2004): all rational forms of trust relying on assumed knowledge of the trustworthiness of the other party. Knowledge derived from stereotypes, group characteristics or previous experiences, form strategies on which people act, whether they are valid or not. In contrast to this approach, some scholars have argued that trust is more than a strategy, but can be moved by altruism or morals as well (Mansbridge, 1999; Uslaner, 2008). Trust as the binding element between people, known or stranger to each other, needs to include more than just a rational assessment. We are able to have faith in someone we have no or little knowledge about, without relying on previous life experiences. This is called

moral trust (Uslaner, 2008). It is this form of trust that goes further than taking a risk based on calculated predictions. These morals can be formed by culture, by respect or by the desire to treat the other as one would wish to be treated himself. Moral reasons works independently from rational trust. However, these motives to trust are fragile and most likely to dominate within an environment with a high economic well-being – a safe background for taking a risk – and high moral punishment in case of a defect of the other party (Mansbridge, 1999).

A vision that lies in between the rational and non-rational conceptualization of trust is the behaviouristic approach, derived from Coleman's (1990) view on trust. This approach stresses that it is not the belief of the trustworthiness of the other party and a risk calculation of the situation only. Social preferences – such as betrayal aversion risk aversion – are defining variables as well: pointing at the willingness of the trustor to be in a vulnerable position in relation to something they desire. Whether trust is viewed from a rational, moral or behaviouristic perspective, the element of vulnerability is said to lay in the essence of trust (Fehr, 2009). To explain this from the behaviouristic perspective, imagine the following: trustor A thinks there is a probability of 0.3 that trustee B does X. Trustor C thinks this probability is 0.5. When A, instead of C, would trust B to do X, this would prove trust, because A has the willingness to put himself in a vulnerable position, without the assurance of cooperation. By this definition, the act to trust is trust (Fehr, 2009). The challenge, however, is how to truly measure trust.

3   Measuring generalized trust

As introduced, two measurement tools have been dominating the field of research on generalized trust: survey-based research (Zak & Knack, 2001), including the trust question, and the experimental approach, including the trust game (Ashraf et al., 2006). Research combining these two tools have been done before as well (Eckel & Wilson, 2004; Ermisch et al., 2009; Fehr et al., 2003; Glaeser et al., 2000), resulting in conflicting outcomes between these two measures, showing a merely weak correlation or no correlation at all. The general opinion has been formed that the survey question does not predict trusting behaviour in the trust games. Although scholars have acknowledged this bias, still, nobody has properly looked at the problem with different methods, nor with different data sets. One of the original experiments comparing survey-outcome

with experimental behaviour, performed by Glaeser et al. (2000), shows that the generalized trust question measures trustworthiness while aiming at measuring trust. However, this study has not been conducted sufficiently, compared to the standards nowadays available. The external validity of the experiment done by Glaser at al. (2000) is questionable, as a replicated research from Holm and Danielson (2005) succeeded in confirming Glaeser's results for the study in Sweden, while finding no support for the same study in Tanzania. The way the data was obtained, pairing up students who knew each other, adds questions to what extent Glaeser et al. (2000) aimed at measuring generalized trust (Nannestad, 2008). This method is outdated and has since then improved.

Although there is no point in denying a discrepancy between the two research methods, the measurement problem has not found its proper solution yet. If we want to be able to draw true conclusions about trust, we should not accept this bias as given and take a fresh shot at the issue. With updated measures and measurement standards, it will both be interesting as useful to take a new chance at solving the issue. Therefore, I take a close look at both of the research methods, to contribute to the existing body of literature.

Survey measurement

The survey based method includes a variation of questions aiming to measure trust, and in some studies trustworthiness, among its respondents. The most common used question is derived from the GGS, as it was inserted in 1972, formulated as the following: "Generally speaking, would you say that most people can be trusted? Or that one cannot be too careful in dealing with people". The question includes the dichotomous answer categories "Most people can be trusted" and "Can't be too careful" (Fehr, 2009).

The first encountered problem with the GSS question is that it is multi-interpretable by the phrasing of the sentence. There is no certainty on who the respondent takes in mind by "most people", the situation mentally abstracted by the word "trust" might differ among respondents and the word "careful" could differ in meaning depending on the respondents personality (Reeskens & Hooghe, 2008). Furthermore, the issue one would have to trust the other with is not specified, which means that the respondent could take a great variation of situations in mind. While generalized trust could occur only in specific situations, the question fails to take this into account by leaving the situation fully unspecified (Nannestad, 2008).

Glaeser et al. (2000) found that the trust question, as formulated above, does not measure trust, but in fact trustworthiness, although the method of this study is rather questionable. According to the study, trust can be measured by asking the respondent about their past trusting behaviour, while trustworthiness can be measured by asking to what extend the respondent trusts others (Glaeser et al., 2000). Another weakness is that most people are able to come up with good reasons to agree with both statements of the trust question: to trust most people and to be careful. The question seems to include more than one dimension, which weakens the validity, when using only two answer categories. Because of these reasons, the famous generalized GSS trust question has revealed it flaws, by being imprecise in its formulation and non-exclusive in its answer categories. Previous studies have shown that GSS question is not a valid or reliable measure of trust. However, the outcome of trust, measured by the GSS question, has been stable over the years and comparable between countries (Naef & Schupp, 2009; Nannestad, 2008; Reeskens & Hooghe, 2008). This means that interpretation of the trust question does not vary extremely between respondents (Nannestad, 2008).

As an improvement, new questions have been formulated, as by Millar and Mitamura (2003): "Do you think that most people can be trusted?", which can be answered in a 7-point Liker scale varying from "not at all" to "complete trust", or similar questions and answer categories, as formulated in the German Socio-Economic Panel and by the World Social Survey (Fehr, 2009). Another improved survey-measure for trust has been developed and included by the European Social Survey, by adding two more items to the GSS question and an 11-point scale for each one of them, because of the idea that trust cannot be measured by one single item. Especially when doing cross national research, at least three items would be required. The two extra items are: "Do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair?" and "Would you say that most of the time people try to be helpful or that they are mostly looking out for themselves?" (Reeskens & Hooghe, 2008). Reeskens and Hooghe (2008) conclude that a 3-item survey on trust can be seen as a successful measure of trust, it would not be sufficient in cross-national comparisons, because of a lack of equivalence.

Claiming that a survey-based method would not be able to succeed in measuring trust, would be a too drastic statement. If well-constructed, we find great advantage in using the survey method because of its possibility to create a large and representative sample at low costs.

However, it is only possible to measure intentions, not behaviour. Therefore, survey-outcome cannot be expected to perfectly predict trusting behaviour in trust games.

Experimental measurement

The other prominent research method on trust is the experiment. Though there are many ways to measure trust with an experiment (Fehr, 2009), the article focuses on the binary trust game. Generally speaking the trust game exists of two people matched to each other as player one, from now on called the trustor, and player two, called the trustee. The trustor receives a certain amount of money, with the option to either keep or send the money to the trustee, knowing that the sent money will be multiplied if sending it and knowing that the trustee will have the possibility to send an amount of this multiplied money back to the trustor. If the trustor sends the money, two possible outcomes arise: either earning more than he would have when keeping the money, or leaving the game with no money at all if the trustee decides not to cooperate. If the trustor decides to keep the money he would at least be secured of ending the game with a relatively small amount of money. The challenge therefore lies in the trust that can be given to the unknown other, which could lead to a fairly good outcome for both players if the trustee appears to be trustworthy (Berg et al., 1995; Gambetta & Przepiorka, 2014; Glaeser et al, 2000; Przepiorka & Liebe; 2015). The trust game has many slightly different versions, varying in the matching process of partners, the amount of money sent, the multiplication of the money and the option to choose the amount or to send all or nothing. However, the dilemma the trust game presents is always the same.

Trust defined from the behavioural perspective, can be perfectly measured by an experiment like the trust game, because how the trustor behaves in the trust game, is in fact trust (Fehr, 2009). The strength of doing an experiment lies in the controlled environment, which offers a high internal validity. The other side of the coin is that the external validity for the same reason is often doubted (Nannestad, 2008). It is hard or sometimes impossible to generalize the laboratory setting as well as the selective sample to real life (Naef & Schupp, 2009).

Hypothesis

Although it seems that someone's behaviour in contact with a stranger would be the indication of trust, it can be concluded that merely using an experiment leaves out the insights on believes and

preferences. Merely using survey data on the other hand, would lack the information on actual behaviour, by measuring only intentions (Fehr, 2009). It may be clear that we might always find a discrepancy between survey outcome and trust game behaviour, because of the simple fact that people do not always do what they intent, something we cannot rule out. Therefore, we cannot expect a perfect correlation.

There are many improvements to the previous research that can be made to create a measurement of trust that could succeed in reaching a significant correlation between the two measures. First of all, when predicting experimental trust, by survey-measured trust, the definition by which they are defined should be as identical as possible. Trust in the experiment is perfectly defined by the behaviouristic approach, because the behaviour, the choice of the trustor, is a direct measure of trust (Fehr, 2009). A survey measure, predicting this behaviour, should therefore contain the elements by which behaviouristic trust has been defined. These elements are considered to be an individual's believes, risk aversion and betrayal aversion (Fehr, 2009). Using multiple items of trust in a survey, gives the advantage of creating a balanced measure of trust that takes these different elements concerning trust into account (Reeskens & Hooghe, 2008). Previous studies have shown that trust cannot be measured by one single item as derived from the GSS (Reeskens & Hooghe; 2008), but could be measured more properly using several items.

Second, it might be possible to partly tackle our discrepancy caused by the vague concept of the general other, by using students, which forms a homogeneous group. This way all respondents think of a general other as another student in the laboratory.

Third, matching respondents randomly and anonymously would be an improvement to the approach of Glaeser et al. (2000), tackling the problem of playing against friends instead of a general other. Therefore it can be expected that under these improved conditions: *survey-measured trust is a valid predictor for trusting behaviour in experimental trust games.*

4 Method

In this study, survey measures will be compared with experimental data, derived from four experiments, including Switzerland, Spain and the United Kingdom; brought together by dr. Przepiorka. The first study is an unpublished laboratory experiment (EXP1), conducted in Zurich,

Switzerland, by Diekmann and Przepiorka in 2010. Respondents take part in a series of six anonymously played games in which they are asked to divide money between themselves and one randomly selected other. The fourth game played is the trust game, where each respondent is asked to make decisions as trustor and trustee. The second experiment is a laboratory experiment with a control condition (EXP2), conducted in 2011 by Gambetta and Przepiorka in Oxford, United Kingdom. The respondents are randomly assigned to a partner to play the dictator game, followed by the trust game which they play in the role of trustor and trustee with different partners. In the analysis of this article only the control condition is used, meaning the behaviour of the dictator game does not influence the behaviour in the trust game (Gambetta & Przepiorka, 2014). The third experiment is a laboratory experiment with a control condition (EXP3), conducted in Zurich, in 2014, by Przepiorka and Liebe. The respondents are randomly paired and assigned to be either trustor or trustee in a binary dictator game, followed by the trust game. Each respondent plays both roles once, first making their decision as trustee, secondly deciding on their move as trustor. In the analysis of this article only the control condition will be used, leaving out any effects of the dictator game (Przepiorka & Liebe 2015). The fourth experiment holds an online experiment (EXP4) by Criado et al., conducted in Spain, in 2012. Respondents participate only once in an online symmetric trust game, either as trustor or as trustee. Respondents have assigned for the experiment via an online registration webpage, leading to an unique access for each respondent. Respondents have been paired systematically instead of randomly, because the original goals the study was to test for co-ethnic concerning Catalonia and the Basque Country. Therefore, matching them systematically allowed a maximum utilisation of pairs that could be formed in order of registration and which allowed the experiment to take place at any time during a month (Criado et al., 2015).

The data holds a total of 1699 respondents. The data from EXP1, EXP2 and EXP3 consist of university students. Only EXP4 originally included both students and non-students (Criado et al., 2015). To create a homogeneous group, non-students are removed from the analysis, excluding 461 respondents. It is important to keep in mind that the results concerning trust levels are not generalizable, since the homogeneous character of the sample is not representative for the population (Naef & Schupp, 2009). It has been proven that students have more trust in strangers than non-students (Fehr et al., 2003), which might influence the level of trust. This, however, is not a concern for the analysis, since it gives us the great advantage of solely testing for the

difference between results from the survey question and behaviour in trust games, which after all is the aim of this study. Additionally, to merely focus on trust, the data is selected for respondents that have played the role of trustor in the trust game. This selection only excludes respondents from EXP4, in which a total of 761 respondents played the role of trustor and an equal 761 respondents the role of trustee.

After the selection for students and trustors, the analysis consist of 938 respondents, from which 52 from the U.K. in EXP2, 125 from Switzerland – 62 in the EXP1 and 63 in EXP3 – and 761 respondents from Spain in EXP4. The age of the selection of respondents differs between 18 and 81 years old, with an average age of 25.5 years old ($SD = 7.884$), the average in the experiments age differs between 23.5 years old in EXP3 and 25.8 year old in EXP4. The analysis holds 395 males (42.1%) and 543 females (57.9%). These percentages differ minimally between the experiments, varying from 41.4% males in EXP4 to 46.2% males in EXP2.

Trust in this study is perceived as defined by the behaviouristic approach: the decision of the trustor, player one in the trust game, to either trust or not to trust. Trusting behaviour of the trustor in the experimental will therefore be used as dichotomous dependent variable. In EXP1 each respondent receives CHF 10 (approximately €7,56[1]) for participation. Additional money can be earned depending on how the games are played out. In the trust game, the trustor gets to choose between ending the game with CHF 2 for both players or leaving the choice to the trustee, who in turn gets to choose between ending the game with CHF 10, while trustor earns nothing, or earning CHF 6 for each of them. In EXP2 the trustor gets £5 (approximately €5.54[1]), with the option to either keep the money and ending the game with £3 for the trustor and £2 for the trustee, or to send the £5 to the trustee, to which £6 will be added. The trustee can either choose to keep £10 and return £1 to the trustor, or split the money by sending £5 to the trustor and leaving the game with £6 (Gambetta & Przepiorka, 2014). In EXP3 each player is endowed with CHF 8 (approximately €6.58[1]) at the start. The trustor has the opportunity split an additional CHF 8 between both players or send the CHF 8 to the trustee. If sending the money, the CHF 8 will be doubled, leaving the trustee to the decision to keep the extra CHF 16 or equally share the amount with the trustor (Przepiorka & Liebe, 2015). In EXP4 both players are endowed with €50 at the start of the experiment, with the option for the trustor to send any amount between €0 and €50 to the trustee. The amount sent is doubled. In turn, the trustee has the opportunity to send an amount

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[1] Approximate exchangerate taken given the 1th of July of the year of conduction (OANDA, 2016).

between €0 and €50 to the trustor (Criado et al., 2015). During the experiment the respondents do not used the names 'trustor' and 'trustee', to not influence their participation in the trust game.

The independent variables are defined by survey-measured trust. In a survey it is only possible to measure trust by intentions, not by behaviour. Therefore, trust is measured by using seven items, each measuring a specific aspect of trust by asking or stating:

- Item 1: How often do you think that people would try to take advantage of you if they got the chance, and how often would they try to be fair?[2,3]

- Item 2: Would you say that most of the time people try to be helpful, or that they are mostly just looking out for themselves?[2]

- Item 3: Generally speaking, would you say that people can be trusted or that you can't be too careful in dealing with people?[2,3]

- Item 4: When dealing with strangers, it is better to be careful before one trusts them.[2]

- Item 5: How often do you lend money to friends?[2]

- Item 6: How often do you lend personal possessions to friends?[2]

- Item 7: Most people are honest.[3]

- Item 8: One must not trust others unless one knows them.[3]

- Item 9: Most people would be inclined to tell a lie if they could benefit from it.[3]

Item 1 and 3 are conducted in all of the experiments. Item 2, 4, 5 and 6 are only conducted in EXP1, EXP2 and EXP3, while item 7, 8 and 9 are only conducted in EXP4. Respondents can

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[2] Originally used in English in EXP2 and in German in EXP1 and EXP3.
[3] Originally used in Spanish, in EXP4 .

answer in a 4-point scale for the first 6 items in EXP1, EXP2. In EXP4 the items 1 and 3 are answered with an 11-point scale and the items 7,8 and 9 are answered with an 5-point scale. For the purpose of this study the value of answers have been coded to indicate higher trust for a higher score on the scale. Originally the answer-scales of item 8 and 9 were reversed. Items 5 and 6 are not used in this study, because they specifically measure trust among friends, which cannot be considered as a general other. The full formulation of the survey questions and answer categories are included in the appendix. In all four experiments, respondents have filled in the survey right after participating in the experiment.

Analysis

The research question will be answered by means of a binary logistic regression, using z-standardized variables, which will be presented by its procedure and results in the following chapter. The significance level of 5% ($\alpha = 0.05$) will be used for a two sided test. Ideally I would like to construct survey-measured trust with as many items as found to be useful, while using all four available experiments. Unfortunately, when including all experiments, I lack an overlap of most items between them. The biggest overlap is found between EXP1, EXP2 and EXP3. However, EXP4 holds the highest body of respondents, which adds great value to the study. Therefore, the analysis will be done in the following steps. First, I have analysed the data from EXP1, EXP2 and EXP3 by creating a 4-item scale out of the sum of item 1 to 4, using the maximum of items available for these experiments. Leaving out the large experiment EXP4 causes a smaller sample size of $N = 172$. The 4-item generalized trust scale is tested by means of a reliability analyses, to see if this scale would be a useful variable. The 4-item generalized trust scale has found to be fairly reliable (4 items; $\alpha = .652$). Removing any of the four items would not improve the reliability of the scale.

Second, I created a scale to predict trusting behaviour within EXP4 separately. I have proposed a 5-item scale – including the sum of the items 1, 3, 7, 8 and 9 – using the maximum of items available in this data. However, the 5-item generalized trust scale has found to be unreliable (5 items; $\alpha = .063$). Removing both item 8 and 9 results in a reliable scale (3 items, $\alpha = .825$), using as many items as been proven useful for EXP4. The large increase of reliability could mean that the items 8 and 9, indicating if respondents think "one must not trust others unless one knows them" and "most people would be inclined to tell a lie if they could benefit from it", are not

suitable to measure generalized trust. Therefore I predict trusting behaviour in EXP4 based on a 3-item scale.

Third, I created 2-item, scale using all four experiments, summing up item 1 and 3, to see whether it is possible to successfully create a scale suitable for all four experiments within the possibilities of this data. The 2-item has found to be highly reliable (2 items; α = .931), when using all experiments as well. Removing an item would not improve the scale, since there would only be one item left.

5 Results

From all students included in the data, 51% decided to trust while playing the experimental trust game, as shown in table 1. To examine whether generalized trust, measured by survey items, can predict experimental behaviour in trust games, I used logistic regression analysis. All three scales are tested in separate models, as shown in table 2. Note that in all of the analysis we cannot be completely sure of a causality case between survey trust and experimental trust, since the survey on which the trust scale is based has been conducted after the experiment.

Table 1: Summary statistics

Variable	Min	Max	Mean	S. D.	N
Trusting behavior in Trust Game[a]			0.51	0.500	938
Survey-based 4-item generalized trust scale[b]	0.00	14.65	7.907	2.757	172
Survey-based 3-item generalized trust scale[b]	0.00	12.02	6.001	2.481	921
Survey-based 2-item generalized trust scale[b]	0.00	9.22	4.550	1.994	921
Age	18	81	25.45	7.884	936
Male[c]			0.421	0.494	938
Swiss 2010/EXP1[d]			0.066	0.249	938
United Kingdom/EXP2[d]			0.055	0.229	938
Swiss 2014/EXP3[d]			0.067	0.250	938
Spain/EXP4[d]			0.811	0.391	938
N = 938					

[a] Coded: 0 = no trust; 1 = trust
[b] Standardized
[c] Coded: 0 = female; 1 = male
[d] Coded: 0 = experiment not in analysis; 1 = experiment in analysis

Table 2: Logistic regression on experimental trust behaviour

	Model 1			Model 2			Model 3		
	B.	*S.E.*	*OR*	*B.*	*S.E.*	*OR*	*B.*	*S.E.*	*OR*
4-item gen. trust scale	0.173**	0.063	1.189**						
3-item gen. trust scale				0.119***	0.028	1.126***			
2-item gen. trust scale							0.136***	0.035	1.146***
Age	0.021	0.027	1.021	0.025**	0.009	1.025**	0.029**	0.009	1.030**
Male	0.349	0.330	1.418	0.479***	0.137	1.614***	0.477**	0.138	1.611**
Swiss 2010 / EXP1	1.099**	0.413**	3.001**	N.E			1.043**	0.317	2.837**
U.K. / EXP2	(ref.)			N.E.			-0.132	0.311	0.877
Swiss 2014 / EXP3	0.504	0.395	1.656	N.E.			0.379	0.281	1.461
Spain / EXP4	N.E.			N.E.			(ref.)		
Constant	-1.736*	0.823	0.176*	-1.498***	0.279	0.224***	-1.591***	0.286	0.204***
R^2	0.134			0.062			0.078		
χ^2	18.087**			43.434***			55.509***		
df	5			3			6		
N	172			919			919		

* $p<0.05$, ** $p<0.01$, *** $p<0.001$; two-tailed test

R^2 = Nagelkerke R-square

N.E. = Not in the equation

The results show a significant positive correlation between the 3-item survey-based generalized trust scale and trusting behaviour in the experimental trust game of EXP4 ($r = 0.155$, $p < .001$). I have performed a logistic regression analysis to see whether a higher score on the 3-item generalized trust scale leads to a higher probability to trust in the experiment. Model 2, as presented in table 2, explains 6,2% of the total variance in trusting behaviour ($R^2 = .062$). The 5-item scale on generalized trust has a significant positive effect on trusting behaviour in the trust game ($B = 0.119$, $OR = 1.126$, $p < .001$), meaning that for every unit increase of trust on the 3-item trust scale, the odds of choosing to trust, rather than to distrust while playing the trust game increase with 13%.

Lastly, I tested the correlation between the 2-item scale of item 1 and 3, and trusting behaviour in the trust games of all experiments. The results show a significant positive correlation between the 2-item survey-based generalized trust scale and trusting behaviour in trust games ($r = 0.145$, $p < .001$). I have performed a logistic regression analysis to see whether a higher score on the 2-item generalized trust scale leads to a higher probability of trusting behaviour in the experiment. Model 3, as presented in table 2, explains 7,8% of the total variance in trusting behaviour ($R^2 = .078$). The 2-item scale on generalized trust has a significant positive effect on trusting behaviour in the trust game ($B = 0.136$, $OR = 1.146$, $p < .001$), meaning that for every unit increase of trust on the 2-item trust scale, the odds of choosing to trust, rather than to distrust while playing the trust game increase with 15%.

6 Conclusion & discussion

Intertwined with social and economic interactions, we find the element of trust, to determine the value, the success and the costs of many transactions (Cook, 2001; Yamagishi & Yamagishi, 1994). On both micro and macro level, trust has found have a positive relation to social capital, economic well-being and governmental efficiency (Zak & Knack, 2001; Putnam, 1994), Therefore, trust has become an element of great interest for scholars of different fields of research (Miller & Mitamura, 2003). Literature has centred trust as both explanatory and response variable, both cause and effect – both the chicken and the egg. We would like to get a tighter grip on an element so full of influence, but so hard to grasp and define (Nannestad, 2008; Fehr, 2009).

However, previous studies have shown that the two main measurement methods of trust – the survey and the experiment – lack the expected correlation (Ermisch et al., 2009; Fehr et al., 2003) or rather predict trustworthiness than trust (Glaeser et al., 2000). Scholars seem to have accepted these facts as given, while I argue we should not. Therefore, this study has focused on taking another stab at the measurement problem, in finding an answer to the question to what extent survey-measured trust can be a valid predictor of trusting behaviour in trust games. This has been done by analysing the flaws and value of previous work on trust, based on which I have come to the following conclusions.

The survey method holds the possibility of asking a person about their intention to trust. The most common trust item, the well-known 'generalized trust question' as derived from the General Social Survey, has been criticized for its use of one item, the imprecise phrasing of the sentence and its non-exclusive answer categories (Fehr, 2009). The experimental trust game, on the other hand, holds the full possibility of purely measuring trusting behaviour, while the information on intentions are left out. As people do not always do as they intent, intentions do not perfectly predict behaviour. For this reason a perfect correlation cannot be expected. However, the data by which previous studies concluded that survey-measured trust does not predict trusting behaviour in trust games (Ermisch et al., 2009; Fehr et al., 2003; Glaeser et al., 2000), has not been measured and conducted sufficiently.

With regard to previous these previous studies both survey and experimental methods, used to conduct the data of my analysis, have been improved in several ways. First, a homogeneous sample of students has been used to strictly test the correlation of survey outcome and trusting behaviour in experimental trust games. Second, the method of Glaeser et al. (2000) has been improved by matching respondents randomly and anonymously in the experiment. Third, the survey-method has been improved with respect to the GSS question, by using multiple items, instead of a single trust item. Reeskens and Hooghe (2008), have proven that trust, as defined by the behaviouristic approach, can find a more precise predictor in multiple-item survey measurement. Based on these improvements I have hypothesized that: survey-measured trust is, in fact, a valid predictor for trusting behaviour in experimental trust games.

In this study, five survey items on generalized trust have been combined into three different survey-based trust scales. By summing up the items within each scale, all scales indicate higher trusting intentions, for a higher score on the scale. The scales are used in the analysis as a

predictor of trusting behaviour in experimental trust games. The data consisted of four different experiments: one from the United Kingdom (2011), one from Spain (2012) and two from Switzerland (2010 and 2014). Bound to the available overlap of items between these experiments, I have first created a 4-item scale, including all experiments but Spain. Secondly, I created a 3-item scale to predict trusting behaviour within the large experiment of Spain. At last, I created a 2-item scale, including the only two items that overlap between all of the experiments, holding the questions: "How often do you think that people would try to take advantage of you if they got the chance, and how often would they try to be fair?" and "Generally speaking, would you say that people can be trusted or that you can't be too careful in dealing with people?".

It is interesting to see, that one of the two items – included in all scales – is identical to the criticized GSS trust question. Previous studies suggested that merely using the GSS trust question would not be a valid predictor of trust (Naef & Schupp, 2009; Nannestad, 2008; Reeskens & Hooghe, 2008). Some even suggesting this item measures trustworthiness, rather than trust (Glaeser et al., 2000). The GSS question, however, has found to be useful in a multiple-item scale. Using multiple-item scale has the advantage of creating a more balanced and precise trust-measure, consisting of the elements by which trust is defined according to the behaviouristic approach: believes, risk preferences and betrayal aversion (Reeskens & Hooghe, 2008). As I have adopted the behavioural definition of trust to measure trust in the experiment, I have measured trust in the survey by elements that come closest to this definition. Reeskens and Hooghe (2008) already proved that trust can be predicted by using multiple items.

I have found evidence that all three scales sufficiently predict trusting behaviour in trust games. These results support the expectation that survey-measured trust can be a valid predictor of experimental trusting behaviour. However, I consider the 2-item scale as the most promising variable. Concerning this study, the 2-item scale holds the advantage of consisting items that have been conducted in all of the experiments, therefore including a larger body of respondents in the analysis. For further research, using a 2-item scale can be considered to be an advantage as well. In doing research, working with multiple items instead of one, is more time consuming, which brings higher costs to the research. Since all three scales are proven to be useful, one should rather choose to work with a 2-item scale, to minimize these costs, without detracting from the goal to properly indicate trust.

By doing this study, there has been taken a step into the desirable direction of creating a survey-measure of trust that enables us to predict trusting behaviour in trust games. However, there are limitations to this study as well. First of all, the measures are still bound to a homogeneous groups of respondents. Therefore, the relation between survey measured trust and trusting behaviour, cannot be generalized to the population. Using students has the advantage of having a grip on the idea of the general other a respondent takes in mind during the experiment. Because the respondents knows their opponent the experiment will be a student as well, it is likely to imagining someone like themselves or someone they share some characteristics with (Foddy et al.,2009). However, when answering the survey question, this general other is still fully unspecified. This could lead to a small difference in the perception of the general other between survey measurement and the experiment, which is a second limitation of using a homogeneous sample. Though, even if students score lower on survey trust than experimental trust: students who score higher on survey-measured trust, show higher levels of trust in the trust game as well. Therefore, I assume that this difference did not affect the correlation, found in this study.

A third limitation is bound by the measurement procedure. As the questions are asked after the experiment, they cannot be a predictor of experimental trust timewise. Although the respondent has not been informed about purpose of the experiment, nor the survey, it is possible that respondents alter their answers to be consistent with their behaviour in the trust game. This could slightly influencing the correlation emerging between survey outcome and trust game behaviour. Further research could adjust to this by conducting the survey question beforehand.

An advantage of our research method lies in the way multiple experiments are brought together, generating a large body of respondents. Although taking this advantage one step further by performing a cross-national analysis was not realistic in this study, it could still be an interesting approach for further research. However, we should be careful when taking together slightly different experiments as one dependent variable. All four experiments differ to a fairly small degree in their selection procedure, mostly compared to the Spanish data. Secondly, they differ in the order of making choices as trustor and trustee, empathizing with either one of the two roles first. Lastly these experiments slightly differ in monetary values and transaction rules, which might result in a small difference in the experience of possible risks and betrayal (Criado et al., 2015; Gambetta & Przepiorka, 2014; Przepiorka & Liebe 2015). I expect these differences

to be small enough to be fairly negligible, with respect to this study. However, it is important to take these differences into account when using multiple data sets.

Additionally, curiosity arises to the question, to what extent a monetary method influences the outcome of trusting behaviour in trust games. Money can be appreciated as a value of measurement for its clear numerical comparability. However, money has a different value to everybody, leading to higher trust for bigger earners (Zak & Knack, 2001). A higher income could result in a higher chance to trust a stranger moneywise during the trust game, but does not equally predict the ability to trust a stranger in handling their child. The trust questions however do not specify the situation. This could mean that a respondent takes a non-monetary case in mind when answering to the survey questions, while using a monetary method in the experiment. Generalized trust, however, is not a form of trust in terms of money transfers only. It would be interesting to control for income, to see whether further research needs alterations on this behalf. Unfortunately it is difficult to create an ethical non-monetary experiment to measure trust.

Aware of the flaws and qualities of both measurement methods presented, it is the art of combining both methods which results in a more complete picture of trust. I have found evidence that survey measured trust, based on multiple-item scales, predicts trusting behaviour in trust games. By means of this study I contribute to the methodology of trust measurement, by reopening the measurement topic and showing that we should put our effort in the perfection of a simple universal trust measure. For this reason, we should continue our search, in creating a measure of trust we can call trustworthy.

7 Literature

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Appendix: Survey Items on Trust

Item 1:

How often do you think that people would try to take advantage of you if they got the chance, and how often would they try to be fair?

Variable name: trust1

Variable label: Take advantage or be fair

Experiment: 1, 2, 3, 4

> *Answer EXP1, EXP2, EXP3:*
> 1. "Try to take advantage almost all of the time"
> 2. "Try to take advantage most of the time"
> 3. "Try to be fair most of the time"
> 4. "Try to be fair almost all of the time"
> Missing: "Don't know / can't say"
>
> *Answer EXP4:*
> 11 point scale from 1 "*no mucho*" - 11 "*mucho*".

Item 2:

Would you say that most of the time people try to be helpful, or that they are mostly just looking out for themselves?

Variable name: trust2

Variable label: Selfish or helpful

Experiment: 1, 2, 3

> *Answer:*
> 1. "Just look out for themselves almost all of the time"
> 2. "Just look out for themselves most of the time"

3. "Try to be helpful most of the time"
4. "Try to be helpful almost all of the time"

Missing: "Don't know / can't say"

Item 3:

Generally speaking, would you say that people can be trusted or that you can't be too careful in dealing with people?

Variable name: trust3

Variable label: Trust 3: Be careful or can trust

Experiment: 1, 2, 3, 4

Answers EXP1, EXP2, EXP3
1. "You almost always can't be too careful in dealing with people"
2. "You usually can't be too careful in dealing with people"
3. "People can usually be trusted"
4. "People can almost always be trusted"

Missing: "Don't know / can't say"

Answers EXP4:

11 point scale from 1 "*No mucho*" - 11 "*Mucho*".

Item 4:

When dealing with strangers, it is better to be careful before one trusts them.

Variable name: trust4

Variable label: Careful when trusting strangers

Experiment: 1, 2, 3

Answers:
1. "Agree strongly"

2. "Agree somewhat"

3. "Disagree somewhat"

4. "Disagree strongly"

Missing: "Don't know / can't say"

Item 5:

Question: How often do you lend money to friends?

Variable name: trust5

Variable label: Trust friends with money

Experiment: 1, 2, 3

Answer:

1. "Once a year or less"

2. "Once a month"

3. "Once a week"

4. "More than once a week

Missing: "Don't know / can't say"

Item 6: How often do you lend personal possessions to friends?

Question

Variable name: trust6

Variable label: Trust friends with things

Experiment: 1, 2, 3

Answer:

1. "Once a year or less"

2. "Once a month"

3. "Once a week"

4. "More than once a week"

Missing: "Don't know / can't say"

Item 7:

Statement: Most people are honest.

Variable name: trust7

Variable label: Most people are honest

Experiment: 4

Answer:

1. "Completely disagree" – 5. "completely agree"

Item 8:

Statement: One must not trust others unless one knows them.

Variable name: trust8

Variable label: Not trust unless known

Experiment: 4

Answer:

1. "Completely disagree" – 5. "completely agree"

Item 9:

Statement: Most people would be inclined to tell a lie if they could benefit from it.

Variable name: trust 9

Variable label: Most lie if benefit

Experiment: 4

Answer:

1. "Completely disagree" – 5. "completely agree"