WILL YOU GIVE HIM SOME MONEY?

External validity of social preferences in Dictator Games

Bachelor's Thesis

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ABSTRACT

To examine the external validity of measurements of social preferences, social preferences as observed and measured on a continuous scale in Dictator Games were related to measures of prosocial behavior outside the laboratory setting. No significant relationship was found, nor could relevant moderators of such a relationship be identified. The findings are discussed in light of four different accounts of social preferences, and relevant considerations concerning research into the internal and external validity of measurements of social preferences are related.

Keywords: social preferences, Dictator Game, external validity, moderators, empathy, trust.

PREFACE

The reader finds before them a work that will hopefully be regarded as the crowning achievement of the two author's Bachelor of Sociology at Utrecht University. After having dedicated an unholy amount of time to it, we are pleased with the result. We would like to thank our supervisor, David Macro, for equally investing long hours in the process which has led to this Bachelor's thesis, and also thank the program's coordinator, Ineke Maas. Lastly, we thank our friends and family for their enduring support.

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INTRODUCTION

Much has been said about the reforms of the Dutch welfare state being implemented under Rutte II (van der Gulden, 2014). These reforms have been presented as a way to bolster citizens' self-sufficiency and keep quality standards high (Putters, 2014), but it is clear that in the aftermath of the global financial crisis the financial sustainability of the current system is also of concern (van der Gulden, 2014). More than half the state budget is spent on welfare, and while the GDP has shrunk, welfare costs keep rising (Van De Maat, Jan Willem & De Coole, 2014). The increased self-sufficiency of citizens is intended to be partly facilitated by people laying more claim on their social networks and volunteers (Putters, 2014). Also part of the reforms is a curtailment on provisions for certain vulnerable groups, as is exemplified by the changes in the WAJONG arrangement (de Koning, 2014). Both personally caring for those in need and the decision to attenuate financial aid to vulnerable others could be seen as dependent on one's social preferences.

'Social preferences' indicates a theoretical term studied by behavioral economists, who over the past few decades have conducted a legion of laboratory experiments providing evidence for the idea that, to put it simply, people are willing to cooperate with others for reasons other than personal gain (List, 2007a). Social preferences, as generally conceptualized, is a variable or multiple variables which indicate the degree and manner in which a person takes the welfare of others into account when deciding on an action, and which can be mathematically represented in what's called a person's 'utility function' (Camerer, 2003). Assuming social preferences and rationality, researchers model people's motives in making choices (their utility function) and then use these models to make predictions concerning which actions people will decide upon in the carefully controlled context of an experimental 'game'. The results of such experimental games can then be used to test the predictions and by extent the assumptions.

Though such experiments have already been conducted for a long time, the validity of using experimental games as a measurement of social preferences, and whether the concept has meaningful implications outside of the experimental context, is still the subject of an ongoing debate in the scientific literature (Levitt & List, 2008; Schram, 2005).

The present study endeavors to help clarify the question of the external validity of social preferences in the frequently used Dictator Game: Is there a relationship between social preferences measured in Dictator Games and indicators of prosocial behavior outside the lab, and what are the possible moderators of this hypothesized relationship?

THEORETICAL FRAMEWORK

In this chapter, a review of the literature as pertaining to social preferences will be presented. In the second chapter, validity in general and the specific concerns as related to the external validity of social preferences will be discussed. In the 'Hypotheses' segment, findings and theories relevant to the specific aim of this study will be related and the hypotheses to be tested derived. In subsequent chapters, the employed methods of the current study will be explained and the results which were found will be presented. In the last chapter, these results will be interpreted in relation to the research question, and the limitations of the current study and implications for future research will be discussed.

BEHAVIORAL ECONOMICS

According to Loewenstein (1999) experimental- and behavioral economics both came of age and were established as disciplines in the last quarter of the previous century. Experimental economists, and neoclassical economic theory in general, typically assume that people are exclusively self-interested (Camerer, 1999; Chang, 2014; Fehr & Fischbacher, 2002) and rational and that therefore economic actors seek to maximize their own utility (Chang, 2014; Fehr & Fischbacher, 2002; Gintis, 2000; Levitt & List, 2008; Rankin, 2011). The hypothetical person who strictly upholds these joint assumptions of self-interest *and* rationality is usually indicated by the term '*homo economicus*'*.* Behavioral economists, however, have argued that assuming people behave like *homo economicus* is incongruent with actual behavior and that their experiments have clearly shown this (Camerer, 2003; Fehr & Fischbacher, 2002; Henrich et al., 2004). Where experimental economists see no problem with making assumptions which have been proven to be false, since such assumptions may still lead to accurate predictions (Camerer, 1999; Chang, 2014) and keep theories simple (Fehr & Fischbacher, 2002), behavioral economists feel that economic theories should reflect the mechanisms of actual behavior (Camerer, 1999). They therefore endeavor to draw from psychology in an attempt to extend economic theory and lend it more realism and explanatory and predictive power (Angner & Loewenstein, 2007; Camerer, 2003; Levitt & List, 2008; Pesendorfer, 2006).

SOCIAL PREFERENCES

New or improved theories that behavioral economists have contributed that better predict behavior in games include: prospect theory, hyperbolic discounting, social preferences (Camerer, 1999; Pesendorfer, 2006), and predictions taking the "endowment effect" into account (Angner & Loewenstein, 2007; Pesendorfer, 2006). An established definition of the concept of social preferences is that it "reflects stable preferences for certain patterns of outcomes for oneself and others" (Bogaert, Boone, & Declerck, 2008, p. 456). Ample research exists which establishes the prevalence of social preferences in a substantial number of the general population (Balliet, Parks, & Joireman, 2009; Bogaert et al., 2008; Chang, 2014; Cornelissen, Dewitte, & Warlop, 2011; Fehr & Fischbacher, 2002; Fehr & Camerer, 2007; Gintis, 2000; Henrich et al., 2004). This is evidenced by the literature review by Au and Kwong (2004) which found that about 46% of people could be classified as prosocials ("cooperators"), indicating positive concern for another's welfare, while 38% of people could be classified as being proselfs ("individualists"),

meaning they act solely to maximize personal gain (Balliet et al., 2009). It should be noted that a person exhibiting 'social preferences' should not indiscriminately be taken to denote that such a person is positively concerned about others' welfare. Exhibiting 'social preferences' simply means that a person takes the results and consequences of their actions for others into account. The term can also include decisions motivated by e.g. envy (Fehr & Fischbacher, 2002; Fehr & Henrich, 2003). Evidence of the prevalence of the types of social preferences which indicate a positive concern for the welfare of others casts doubt on the ubiquity of the self-interested part of the *Homo economicus* assumption, but doesn't necessarily challenge the rationality assumption nor does it discredit game theoretical principles (Camerer, 2003; List, 2007b).

MEASURING SOCIAL PREFERENCES

Experimental data on social preferences is very frequently generated by conducting social-dilemma games such as a trust game, a third party punishment game, a public goods game, the Ultimatum Game, or the Dictator Game (Fehr & Camerer, 2007; List, 2007a). In the Dictator Game, one player - the proposer - is endowed with an amount of money and is asked to decide on an allocation of this money, dividing it between himself and one or more other players, the responder(s). Depending on the action set, the proposer has the freedom to dictate any allocation, as the responder - besides receiving the proposed split if there is anything to receive - has no say in the matter. Thus a situation of outcome dependence - but not interdependence - is created, in that the proposer's choice determines their own and one or more others' outcomes, but the responder(s) don't determine anyone's outcome (Cornelissen et al., 2011). Since the first experimental Dictator Game was conducted in 1986, subsequent experiments have regularly found that above 60% of proposers allocate money to the responder(s), with the mean transfer being around 20% of the proposer's endowment (Camerer, 2003; List, 2007a). Dictator Games are frequently played one-shot, meaning players are paired to each other only once; with strictly anonymous players and stakes which are paid out in actual money (Fehr & Camerer, 2007, p. 420). The Dictator Game is viewed by researchers as being able to separate between the joint motivations of exclusive self-interest and rationality which constitute the *homo economicus* assumption. It is so viewed for several reasons. Being played one-shot, with the anonymity requirement ensuring participants meeting each other after the experiment isn't a threat to this circumstance (Fehr & Henrich, 2003), and within the context of outcome dependence but not interdependence, the Dictator Game is seen as eliminating any rational, strategic considerations the proposer might otherwise have in deciding on a monetary allocation (Cardenas & Carpenter, 2005; List, 2007a; Samuelson, 2005). This way, the proposer's decision theoretically solely reflects their social preferences and can therefore function as a measurement of these preferences.

RELEVANCE OF SOCIAL PREFERENCES

Streeck (2013) indicates that economists generally take theoretical criticisms seriously only when they are accompanied by satisfactory solutions. While social preferences have yet to be comprehensively integrated with mainstream, neo-classical economics, Carpenter and Seki (2011) indicate that economists would only start looking for such integrations once the relevance of social preferences for economic theory has been established, something which is often neglected in behavioral economics in general (Pesendorfer, 2006).

On this account Fehr and Fischbacher (2002) have interpreted results of multiple experiments with social dilemmas, which are indicative of social preferences, in relation to economic theory. They state that "economists fail to understand core questions in economics if they insist on the self-interest hypothesis and rule out heterogeneity in the realm of social preferences." (p. 1). They argue that this is the case because the existence and heterogeneity of social preferences in the population influence the effects of: competition on market outcomes; laws governing cooperation and collective action; effects and determinants of material incentives (see also Bowles & Polania-Reyes, 2012); which contracts and property rights arrangements are optimal; and forces shaping social norms and market failures (see also Chang [2014]; (Fehr & Fischbacher, 2002). Carpenter and Seki (2011) go beyond such theoretical implications of social preferences, and find a strong, direct link between the distribution of social preferences among the members of fishing groups in Japan and how productive these groups are.
In relation to this, it has been established that a person's social preferences is related to how much they are willing to cooperate in social dilemmas (Balliet et al., 2009; Bogaert et al., 2008; Cornelissen et al., 2011), in both laboratory and field settings (Bogaert et al., 2008). In a meta-analysis of 82 studies concerning this relationship Baillet et al. (2009) found "[a]significant and small to medium effect size (r = .30)." (p. 533).

EVOLUTIONARY ACCOUNTS

Few research has been done on the stability and causes of social preferences as a trait (Bogaert et al., 2008). Yet there are indications that suggest they have a basis in a person's biological constitution (Bogaert et al., 2008; Fehr & Camerer, 2007; Penner, Dovidio, Piliavin, & Schroeder, 2005) and are fairly stable in the population (Bogaert et al., 2008; Cornelissen et al., 2011). Though the existence of social preferences which influence decision-making behavior is accepted by behavioral economists, there are different controversial viewpoints based on evolutionary theory as to why they manifest in social interactions (Fehr & Camerer, 2007; Penner et al., 2005). One viewpoint is that (**E1**)[1] prosocial behavior is conducive to evolutionary success through mechanisms of kin selection (also Cornelissen et al, 2011), reciprocal altruism and/or costly-signaling (indirect reciprocity; (Fehr & Henrich, 2003; Penner et al., 2005). In this viewpoint, the ultimate explanation for the prevalence of social preferences in a proportion of the population is that such preferences constitute a fitness incentive when expressed as social behavior (Fehr & Henrich, 2003; Penner et al., 2005). Consequently, social preferences are evolutionarily selected for due to having a basis in one's neuroanatomy, which is influenced by genes that can be passed on to future generations (Fehr & Henrich, 2003; Fehr & Camerer, 2007; Penner et al., 2005). In this viewpoint social preferences are regarded as ultimately being extrinsic, and individuals are hypothesized not to cooperate with anonymous others with which there is no possibility of having any future interactions. Therefore what is termed 'strong reciprocity' (which is cooperation between anonymous individuals), is seen as a 'maladaptation', projected to disappear under ongoing evolutionary pressures (Fehr & Henrich, 2003).

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[1] In the Appendix a schematic overview of the different accounts of social preferences (E1, E2, E3 & E4) and their expected implications for this study is provided.

Fehr and Henrich (2003), however, offer another evolutionary viewpoint, stating that the existence of strong reciprocity cannot be explained by the aforementioned ultimate mechanisms of kin selection, reciprocal altruism and/or costly-signaling and the accompanying conclusion that strong reciprocity is a 'maladaptation'.

They argue that (**E2**) propensities towards strong reciprocity must be explained as having formed through culture-gene coevolution, and that models developed by Boyd, Gintis, Bowles and Richerson (2003) and Gintis (2000) provide convincing evidence for the possibility of this claim (also cf. Henrich [2004] and Fehr, Fischbacher & Gächter [2002; Fehr &Henrich, 2003). In Fehr and Henrich's (2003) viewpoint culture-gene coevolutionary between-group pressures would have led to the selection of those individuals whose social preferences are intrinsic, and therefore individuals are hypothesized to cooperate with anonymous others in situations without the possibility of future interactions. On the other hand, within-group selection is hypothesized to have led to evolutionary pressures conducive to exclusively self-interested individuals (Fehr & Henrich, 2003). Within the framework of Gintis' (2000) model, these two pressures of within-group and between-group selection provide the conditions for individuals with social preferences and only self-interested individuals to coexist in evolutionary equilibrium (Fehr & Henrich, 2003).

Alternative accounts of social preferences, as exhibited and measured in laboratory experiments, which are not based on evolutionary mechanisms also exist. However, these accounts depart from the auxiliary claim that experimentally generated data which supposedly measure social preferences are an invalid measure of said social preferences, and that the experimental data are therefore better explained by what are considered 'personal preferences' (Samuelson, 2005).

ALTERNATIVE ACCOUNTS

Many criticisms are levelled at the practice of developing economic theory on the basis of empirical regularities found in laboratory experiments, but this is especially the case when it comes to research into social preferences (Angner & Loewenstein, 2007; Loewenstein, 1999; Samuelson, 2005; Schram, 2005). The auxiliary claim which leads some researchers to interpret experimental data as evincing personal preferences rather than social preferences will be treated first. A more detailed exposition of other criticisms regarding experimental social preferences research will be given after relating the possible alternative explanations for the relevant data.

The alternative accounts of social preferences as personal preferences center around the argument that experimental participants view the experiment differently from how the experimenter intended them to (Samuelson, 2005). Specifically, whether participants truly view the conducted one-shot games as one-shot interactions, or really as a part of a repeated interaction, has a definitive effect on how the generated data should be interpreted.

The argument that participants play one-shot games as though they were part of a repeated interaction involves the claim that participants in laboratory experiments are evolutionarily incapable of comprehending one-shot interactions (Fehr & Henrich, 2003).

Alternatively, the claim is made that they are unable to understand one-shot interactions because of their 'bounded rationality' (Fehr & Fischbacher, 2002; Fehr & Camerer, 2007; Levitt & List, 2007; Rankin, 2011).

Fehr and Henrich (2003) make the argument that based on empirical evidence concerning the types and frequency of interactions in the environment of human evolutionary adaptiveness, humans should be capable of distinguishing one-shot from repeated interactions and indicate that experiments conducted by e.g. Gächter and Falk (2002) show that this is the case. Levitt and List (2007), however, claim that the empirical evidence on this subject is mixed. Samuelson (2005) relates a different argument for why there might be a discrepancy between how participants view their actions and in what way the experimenter intended participants to view them. He states that regardless of understanding the nature of a one-shot interaction, participants might still play the experiment as though they were part of a repeated interaction because of possible difficulties with ensuring the complete anonymity requirement in the experiment (Samuelson, 2005). These difficulties are most apt to arise in small-scale societies (Samuelson, 2005), yet it might be conjectured that similar problems could arise with participants that are members of close-knit social groups.

If participants view a one-shot Dictator Game as though it were really part of a repeated interaction this would mean that such an experiment does not satisfy the necessary conditions in order to be able to separate the assumption of rationality from self-interestedness. Therefore, participants' allocation decisions - rather than being taken as indicative of social preferences - would have to be construed as (*E3a*) being informed by strategic considerations such as might be incentivized by e.g. mechanisms of reciprocal altruism and/or indirect reciprocity (Levitt & List, 2007). Alternatively, (*E3b*) participants might not consciously take such considerations into account, but would however still act upon them through having reflexively learned to do so through their experiences in 'real life'. This opens the door to interpreting the results of such games as affirming the *homo economicus* assumption, which is exactly the (auxiliary) hypothesis the experimenter would have set out to refute.

Another account of the data generated in social preferences experiments is provided by Kümmerli, Burton-Chellew, Ross-Gillespie and West (2010). Besides the claim that participants misunderstand the severely limited scope of the interaction - leading them to actually play self-interestedly, Kümmerli et al. (2010) provide another reason, centered around the typical experimental designs employed, for why data could have been misinterpreted as being indicative of social preferences. They state that such experimental designs "[make] it impossible to decouple any form of mistake or error (in the context of the experimental setting) from cooperative decisions" (Kummerli et al., 2010, p. 10125).

According to Kümmerli et al. (2010), the use of experimental designs without the necessary control treatments to distinguish erroneous decisions from cooperative ones has led researchers to systematically overestimate participant's cooperativeness and therefore to misinterpret such erroneous decisions as evidence of social preferences. These erroneous decisions are hypothesized to be caused by (*E4*) psychological drives which lead a participant to want to avoid "extreme behaviors" such as full cooperation or full defection, or otherwise avoid "irrevocable actions", despite the participant fully understanding the experiment and therefore by extension that such avoidances would be irrational (Kummerli et al., 2010, p. 10127).

Fehr and Henrich (2003) and Fehr and Fischbacher (2002) also indicate that while studies such as that of Gächter and Falk (2002) are indicative of participants cognitively understanding a one-shot experiment, participants' emotions might have an influential effect on their decisions.

Related to the subject of participant affect influencing observed decisions, Cornelissen et al. (2011) find that social preferences "as a measure of chronically accessible goals to pursue the interest of others or the self, is expressed automatically in behavior" (p. 8). Furthermore, they found that when participants weren't cognitively taxed and able to freely deliberate on their choices, prosocials, whom when making automatic decisions were considerably more generous than proselfs, reduced the amount they allocated to responders to the extent that there was no longer a significant difference between prosocials and proselfs (Cornelissen et al., 2011). As Cornelissen et al. (2011) relate; ordinarily neo-classical economists assume that a decision to cooperate involves deliberatively weighing the costs and benefits of cooperation and that a decision to cooperate is reached only when the benefits outweigh the costs. Indeed, this rational decision-making process (as is assumed in rational choice theory) is also the underlying assumption of the models of behavioral economists, without which the conceptualization of social preferences - as a variable which a person includes in their utility function - would lose much of its cogency[2]. However as the results of Cornelissen et al. (2011) indicate, the process by which individuals arrive at their preference concerning the outcomes of others is perhaps better described as a "quick, automatic judgement" (p. 2).

VALIDITY CONCERNS

There is a long history of drawing the validity of experiments conducted by economists into doubt, and in particular experiments pertaining to social preferences (Angner & Loewenstein, 2007; Samuelson, 2005; Schram, 2005). In this chapter, an overview of the relevant concerns will be presented and past research into these concerns discussed. Reliability is a necessary precondition for a measurement instrument to yield valid measurements of the theoretical term in question. In this study, the reliability of the eventual social preferences operationalization is assumed to be assured, wherefore reliability as a condition for validity will not be discussed.

VALIDITY IN GENERAL

There is a distinction to be made between an experiment's internal - and external validity. In Guala's (2002) definition: "an experimental result is internally valid, if the experimenter attributes the production of an effect B to the factor … A, and A really is the … cause of B in the experimental set-up E … it is externally valid … if A causes B not only in E, but also in a set of other circumstances of interest F, G, H, etc' (As referenced in Schram, 2005, p. 235). Borsboom, Mellenbergh and van Heerden (2004) argue that the validity literature as mainly pertaining to psychological experiments "either fails to articulate the validity problem clearly or misses the

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[2] Pesendorfer (2006) makes the point clearly; behavioral economists depart from behavioral deviations from the *homo economicus* assumption in standard economic models and incorporate biases or mistakes in the underlying rational choice model in order to arrive at better descriptions of observed behavior. Yet the incorporation of such biases and mistakes begs the question of whether the rational choice model shouldn't be abandoned altogether. For Pesendorfer (2006); "[t]he metaphor of an operator of a broken machine comes to mind" (p. 718).

point entirely" (p. 1061). In short, they make the argument that what has over the years evolved to be considered different types of the property validity should really be considered different types of validation activities, and emphasize that for a measurement procedure to be a valid measure of an attribute, the attribute it purports to measure must exist and be the cause of variations in the outcomes of said measurement procedure (Borsboom et al., 2004). So where internal validity concerns whether or not a measurement procedure is a valid way of gauging a theoretical variable, external validity concerns whether such a variable is applicable in a different context from the one in which it was measured: an experimental finding's generalizability. As Schram (2005) relates, there is a "tension" between the two since what's done to ensure the one can be to the detriment of the other (p. 226).

The goal of an experiment dictates whether ensuring the internal – or external validity is more important; testing a theory necessitates high internal validity, while searching for empirical regularities in order to develop new theory or improve on existing ones requires experiments having high external validity (Levitt & List, 2007; Schram, 2005).

The research goal concerning social preferences can be considered as falling squarely in this latter category. It is therefore problematic that the generalizability of behavioral economists' experimental findings, and those pertaining to social preferences as currently modeled in particular, is considered by some researchers to be low (Bardsley, 2008; Levitt & List, 2007; List, 2007a; Loewenstein, 1999; Pesendorfer, 2006; Schram, 2005). The issue is perceived to be problematic to such a degree that it has led Levitt and List (2008) to name "demonstrating [behavioral economics'] applicability in the real world [it's] greatest challenge" (p. 909), and Schram (2005) to state that experimental findings concerning social preferences,"[i]f the aim is to make any claims about other regarding preferences in the world at large, … appear … useless" (p. 233).

VALIDITY & SOCIAL PREFERENCES

In relation to research into social preferences the doubts concerning external validity mainly center on what is perceived as the artificiality of the experimental context and the conducting of experiments with a biased sample (Levitt & List, 2007; Schram, 2005). Levitt and List (2007) argue that the external validity of experiments relating to social preferences is threatened by: *1)* the singular extent of scrutiny that is directed at experimental participants' behavior; *2)* the stakes involved in conducted games; *3)* a possible bias in the sample of participants which experiments are generally conducted with; and *4)* demand characteristics of the experimental design. These variables are all hypothesized to have a causal effect on the outcomes of social-dilemma games conducted in laboratory experiments, concomitant with the effect of a participant's social preferences. This leads Levitt and List (2007) to conclude that the experimental context is highly influential in the measuring of social preferences. Yet this doesn't automatically disprove their existence nor possible relevance, but rather highlights the need to "take great caution … when attempting to generalize lab results out of sample: both to other populations and to other situations" (Levitt & List, 2007, p. 154). In the following, the variables discussed by Levitt and List (2007) will be treated in turn and in the same order as listed.

INSIGNIFICANT CONCERNS

The level of scrutiny in a laboratory experiment is seen to be relevant due to it's nature and extent (Levitt & List, 2007). Yet despite specifically taking research into social preferences as the focus of their critique, Levitt and List (2007) disregard the generally strict anonymity requirements of most such experiments. The anonymity requirement could be argued to effectively obviate the influence of scrutiny and was present in the experiment conducted as part of this study. It's possible influence will therefore be disregarded in this study.

Levitt and List (2007) report that the available evidence on the influence of the size of the monetary stakes involved in social-dilemma games is mixed. Cornelissen et al (2011) report that proposers' decisions in the Dictator Game are relatively unaffected by the size of their endowment, as does Camerer (2003), while Angner and Loewenstein (2007) report that the size of the stakes involved have a considerable influence. Since Levitt and List (2007) hypothesize that higher stakes would attenuate the influence of social preferences, and considering that the stakes involved in the present study were small, a possible effect of the size of the endowment on participant's behavior will be neglected.

Social science laboratory experiments are generally conducted with university students whom self-select to participate in the experiment (Camerer, 2003; Falk, Meier, & Zehnder, 2013; Levitt & List, 2007; Rankin, 2011). If such a particular population were to systematically behave differently from other possible populations, or that the self-selecting process by which participants become involved in experiments entails a selection bias, this would constitute a threat to external validity. While Levitt and List (2007) and Rankin (2011) refer to self-professed limited data which they find indicative that these circumstances might indeed be problematic, Falk et al. (2013) conduct experiments whose results fairly conclusively indicate that it isn't, and even find that student participants behave significantly less generously than participants recruited from the general population. These findings are corroborated by the study of Carpenter and Seki (2011). Furthermore, Cardenas and Carpenter (2005) find that the observed empirical regularities relating to behavior in Dictator Games generalize to participants in developing countries. It is therefore deemed appropriate to assume that there is no influential selection bias involved in the sample participating in the present study's experiment.

SIGNIFICANT CONCERNS

Though the preceding analysis of possible concomitant influences on the measurement of social preferences in laboratory experiments yielded no significant threats to external validity, there are three other variables which could possibly prove to be influential, specifically in relation to Dictator Games; demand characteristics, a range effect and participants' perception of the nature of the endowment.

Demand characteristics could lead to an artificially inflated number of positive allocations from proposers to responders in Dictator Games. Bardsley (2008) defines demand characteristics as "the cues the protocol supplies about appropriate behaviour" (p. 128). It's hypothesized that subjects could infer what is deemed as the appropriate behavior through the specific wording of the protocol (Levitt & List, 2007) or the available options in the action set (the different allocations a participant is allowed to choose from) (Bardsley, 2008; Korenok, Millner, &

Razzolini, 2014; Levitt & List, 2007; List, 2007a). In relation to the latter, Bardsley (2008) and List (2007b) find that proposers in a Dictator Game allocate significantly less money to responders if the action set includes the option for the proposer to take money from a responder's endowment. This would be the case because when action sets include only 'giving' options, a participant infers that it is expected of them to give away some of their endowment (Bardsley, 2008; List, 2007a). This perceived expectation acts as a 'frame' through which the participant views the decision to not give anything as inappropriate, and therefore is impelled to give away some of their endowment to the responder in order to signal to others (Bogaert et al., 2008), or themselves that they are a 'good' person (List, 2007a). The argument has been made that when the action set includes two 'take' options - one in which the proposer would take the responder's whole endowment, and one in which he'd only take a portion - and the proposer chooses not to take the responder's whole endowment, that should also be considered an expression of social preferences. However, Korenok et al. (2014) find that participants are more averse to taking than they are inclined to giving, and therefore that the results found by Bardsley (2008) and List (2007b) cannot be rationalized by the explanation that not taking all of a responder's endowment is equivalent to giving. If a participant's behavior in the Dictator Game is influenced by perceived cues in the action set or protocol, this would result in an artificially inflated number of incidences of positive allocations by proposers to responders.

Similarly, Bardsley (2007) also finds results pertaining to social preferences in a Dictator Game which lend themselves to the interpretation that a 'range effect' could be a relevant influence on the outcomes of the game. A range effect occurs when the derived utility of an action by a participant is influenced by the range of available alternative options (Bardsley, 2008). If an action set were to consist of a large range of positive allocations, then a range effect would induce participants to allocate a larger sum to responders than they would have under different circumstances, making their decision substantially dependent on the context in which it was made.

The final variable which could artificially inflate certain results and have a determining effect on behavior in social-dilemma games is participants' perception of the nature of the endowment. Camerer (2003) states that "by inducing value using money payments, the experimenter need rely only on the assumptions that everybody likes having more money and nobody gets tired of having more of it" (p. 39). While these assumptions would probably hold for the vast majority of the population, they don't take into account that behavior, specifically giving behavior, might be significantly influenced by the nature of that which a participant is giving away. The incidence of money allocations from proposers to responders might be positively influenced by the fact that the money was already freely given to the proposer in the first place (what might be considered a 'windfall') (Samuelson, 2005). Somewhat corroborative of this intuition, List (2007b) finds that at least in a taking game, the incidence of taking increases when responders were freely given the money as opposed to a condition in which they had to earn it.

It could be argued that in 'real life' a person would be less motivated to share what he has himself invested time and effort in, than for example money he serendipitously found in the street. Schram (2005) also relates the opinion that specifically the nature of the endowment that is generally made to proposers in Dictator Games seems to be especially artificial (p. 236). The 'windfall' nature of the endowment in most Dictator Games, and indeed that of the present study, could artificially inflate the number of incidences of positive allocations by proposers to responders.

While the evidence that there does exist a heterogeneous trait as conceptualized by social preferences - which influences distribution allocations in Dictator Games - is convincing, there are also indications that the variability in such experimental data might concomitantly be influenced by factors other than the hypothesized trait. If this is the case, it would mean that the variability in the data isn't exclusively causally linked to a social preferences trait, which would threaten the validity of such data as an exclusive measurement of social preferences. Social preferences as currently conceptualized are variables which individuals factor into their utility functions, by which - through the process of rational choice - individuals come to a decision concerning what behavior to express. This implies that social preferences are currently modeled to be 'context free'; the utility derived from others' outcomes is independent of the context within which a decision is made and must therefore always be the same for the same person across differing contexts. Variables like demand characteristics, the possibility of a range effect occurring and the influence of the nature of that which is given, could represent context specific factors which can influence a person's social preferences or the expression thereof. Since almost no social-dilemma experiments currently employ relevant control treatments for these variables, the received empirical regularities may be less externally valid than previously assumed. Since the experiment in the current study has not employed such control treatments either, these factors may prove to have a considerable influence on the findings.

PREVIOUS EXTERNAL VALIDITY STUDIES

While studies examining the relationship between social preferences as measured by laboratory experiments and prosocial behavior in 'real life' historically have been scarce, recent years have seen an increase in such studies in response to the raised concerns about the external validity of social preferences (Angner & Loewenstein, 2007; Levitt & List, 2008).

An oft cited within-subjects study that linked a laboratory measurement of social preferences via a gift exchange game to a field experiment is that of List (2005); finding that while subjects exhibited social preferences in the laboratory experiment, their behavior in the field more closely resembled what would be expected on the basis of the *homo economicus* assumption. However a more recent within-subjects study by Franzen and Pointner (2013) did find that social preferences, as measured by Dictator Games in the lab, had a significant relationship to people returning ostensibly misdirected letters containing money. Furthermore, Carpenter and Seki (2011) find that social preferences, as measured by a variant of a repeated voluntary contribution mechanism, are significantly related to the productivity of cooperative Japanese fishermen at the *meso* level.

Despite these last two confirmatory studies, it seems the external validity of laboratory measurements of social preferences, and the threatening influences thereof, is not yet fully understood nor undisputed.

HYPOTHESES

In order to further establish the external validity of social preferences as measured in laboratory experiments, this study will seek to establish a relationship between social preferences and prosocial behavior in the field.

Hypothesis 1: There is a relationship between social preferences and prosocial behavior.

Indicators of prosocial behavior are mostly based on self-reported data. These measures often include association membership (Tanis & Postmes, 2005), volunteerism (Finkelstein et al., 2005) and the donation of both blood and organs (Bekkers, 2006). All four of these measures will be discussed below, as well as possible moderating variables.

TRUST

It is to be expected that the relationship between social preferences and prosocial behavior is stronger for individuals with higher levels of attitudinal trust. Bogaert et al. (2008) find that the relationship between social preferences and behavior is moderated by trustworthiness. The experiments reviewed by Bogaert were based upon situational *perceived* trustworthiness, moderating the way in which social preferences of the participants determined their actions. Scott (1980) also found both significant attitudinal and situational components of trust affecting prosocial behavior. Based on Scott's work, it can be concluded that the attitudinal components of trust *(as measured by yy1 to 30)* can serve as predictors of prosocial behavior in itself. This was confirmed by Cadenhead and Richman (1998), who demonstrated a relationship between interpersonal trust, aggression and prosocial behavior. Though attitudinal trust differs from the situational trust mentioned by Bogaert et al. (2008), both should be expected to moderate behavior, since the influence of attitudinal trust on prosociality has already been demonstrated (Scott, 1980; Cadenhead & Richman, 1998). Therefore the following hypothesis is derived:

Hypothesis 2a: The relationship between social preferences and prosocial behavior is stronger for individuals with higher levels of attitudinal trust.

When less situational effects are present, attitudinal effects can be expected to have a comparatively bigger influence (Scott, 1980). Organized blood donorship lacks these personal relationships and signifiers, the only situational form of trust being professionalism (Frowe, 2005). Comparatively few indicators of trust are available, which should increase the effect of attitudinal trust. Organ donation involves a similar amount of professional trust, but as it occurs post-humously, most situational expectations become irrelevant (Glynn, 2002).

Therefore situational trust can be expected to play a bigger role in association membership and volunteering, as these are forms of prosocial behavior that rely on salient social groups and identification-based trust (Kramer & Wei, 1999).

Hypothesis 2b: It is more likely that the relationship between social preferences and either form of donorship is stronger for individuals with higher levels of attitudinal trust, than is likely to be the case for the relationship between social preferences and volunteerism or association membership.

Empathy is defined as the ability to discern and experience the emotional state of another being (Penner, 2005). It is generally agreed that empathy precedes many prosocial acts (Penner, 2005). Empathic responses are observed even in infants shortly after birth, suggesting that such responses are at least partially innate (Preston & de Waal, 2002). Although empathic ability has been cited as a direct cause of behavior , this research specifically focuses on its moderating effect on social preferences and prosocial behavior. A lack of empathy is related to a lack of responsiveness to distress cues (Blair et al., 1997). Without the ability to both cognitively and affectively recognize other person's emotions, the subject cannot perceive the needs of persons in distress (Cohen & Strayer, 1996). This, in turn, prevents the subject from acting upon this need by offering his or her support. Thus, one's social preferences won't manifest themselves as prosocial behavior if the need for such behavior cannot be recognized by the subject (Blair et al., 1997). Furthermore, evidence exists of empathy moderating prosocial behavior in multiple types of donation games, specifically Prisoner's Dilemmas, even under conditions of anonymity (Batson et al., 1995; Batson & Moran, 1999).

In light of the preceding, empathy can be expected to moderate the relationship between social preferences and prosocial behavior.

Hypothesis 3a: The relationship between social preferences and prosocial behavior is stronger for individuals with higher levels of empathy.

It has been established that a close connection to the empathic target triggers more empathic reactions and different kinds of actions (Penner, 2005). Davis et al. (1999) linked empathy to a strong willingness to engage in volunteering activities. Similarly, Stürmer et al. (2006) found a strong link between association membership and empathy. On the other hand Ferguson et al. (2008) concluded that influences of empathy on (blood)donorship were often overestimated, actually being weak due to the recipient being unknown. The more well-known the target of empathic feelings, the more strongly empathy will affect behavior with regard to the target.

In this case, the hypothesized relationship between social preferences and volunteering and association membership should be more strongly influenced by empathic ability than either form of donorship, whose recipients are unknown.

Hypothesis 3b: It is more likely that the relationship between social preferences and volunteerism or association membership is stronger for individuals with higher levels of empathy, than is likely to be the case for the relationship between social preferences and either form of donorship.

The above hypotheses and theories are based on a generalized notion of empathy. However, more specific notions of empathy, which differentiate between types of empathy, have also been conceptualized. To fully explore the moderating influence of empathy, hypotheses will be formulated for these specific types of empathy.

Määttä (2006) discussed the concept of empathy as understood by 19th century philosopher Edith Stein, and her model of closeness and distance. Edith Stein distinguished between close empathy applied to known persons, whom the person relates to through 'identification merging', and distant empathy applied to unknown and possibly fictional persons.

The findings of Penner (2005), which showed different levels of emotional affection depending on the situation, support this theorem. Closeness affects membership and volunteerism through the shared bonds with friends and co-workers. Donorship in either form is expected to be less affected, as close empathy plays little to no role in donating blood or organs to anonymous faraway persons (Glynn et al., 2002).

When combined with the influence of empathy in general on the relationship between social preferences and behavior (Penner, 2005) influences of close empathy can be expected to differ among different measures of outcome:

Hypothesis 3c: It is more likely that the relationship between social preferences and association membership or volunteering is stronger for individuals with higher levels of close empathy, than is likely to be the case for the relationship between social preferences and either form of donorship.

Similarly, Blair (2005) proposes that empathy encompasses dissociable neurocognitive processes. He specifically differentiates between cognitive and affective empathy. Cognitive refers to comprehending another person's emotions as a theory of the mind, while affective empathy involves being able to vicariously experience the feelings of another. Although the ways in which empathy can be divided into sub-scales is often disputed (Cohen & Strayer, 1996), the distinction between cognitive and affective empathy has been endorsed by many researchers (Jolliffe & Farrington, 2006; Reniers et al., 2010).

It is arguable that specifically cognitive empathy will have an influence on prosocial behavior that requires a person to be able to relate to someone they don't know and of which it is very unlikely that they will ever meet (Blair, 2005). These conditions are similar to those in which someone engages in either form of donorship (Glynn et al., 2002).

Hypothesis 3d: It is more likely that the relationship between social preferences and either form of donorship is stronger for individuals with higher levels of cognitive empathy, than is likely to be the case for the relationship between social preferences and association membership or volunteering.

The above hypotheses are stated in such a way as to be able to draw comparisons between the different models solely on the basis of whether the model is significant or not. This entails that possibly significant and differing effect sizes between models will not be tested nor comparatively interpreted. Such an analysis would require employing techniques beyond the scope of statistical knowledge of the authors (e.g. multilevel analysis).

It should be noted that various studies have found gender differences in prosocial behavior (Croson & Gneezy, 2006). Explanatory factors for gender differences include risk preferences, competitive preferences and empathic preferences. Since risk and competition play no role in the non-strategic dictator game, nor in volunteering or the donation of blood or organs, the only expected cause of gender differences is empathic preferences (Glynn et al., 2002; Bekkers, 2006; Finkelstein et al., 2005; Hancock, 1992). Since empathy is already being measured, gender has been left out of the equation, as it would amount to measuring the same thing twice.

Individual characteristics like age, education and wealth have little to no relationship to measures of social preferences in social-dilemma experiments, and will thus not be controlled for (Henrich et al., 2004).

The complete theoretical model is presented in *Scheme 1* below.

Scheme 1.
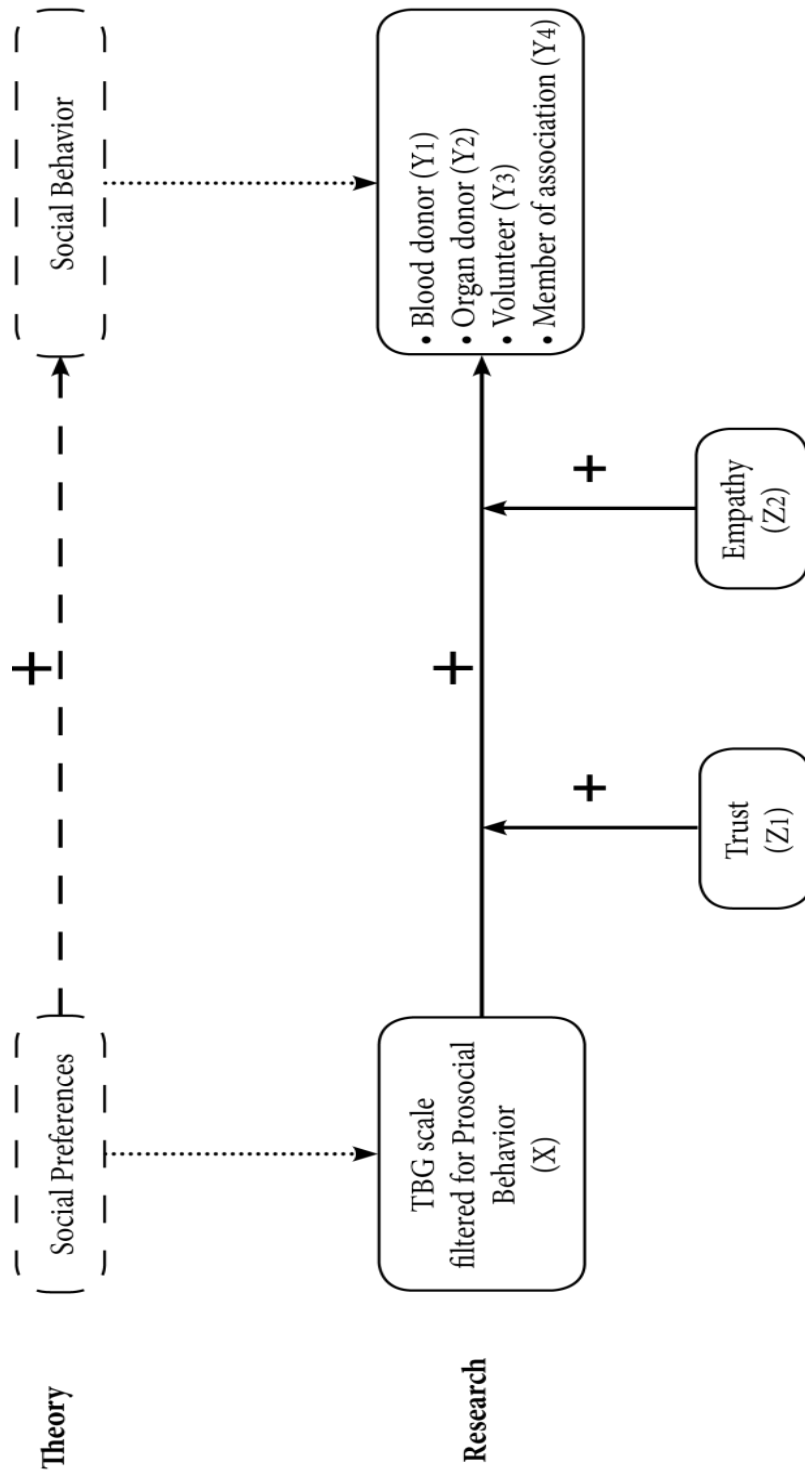
METHODS

In this chapter, the experimental procedure, the operationalization of theoretical terms and method of analysis will be explained.

EXPERIMENTAL DESIGN

Both male (n = 132) and female (n = 173) subjects participated in experiments conducted at the Experimental Laboratory for Sociology and Economics (ELSE) of Utrecht University, between the 11th of April and the 28th of May 2013. Subjects were recruited from registered members of the ELSE database. Most of the subjects were Bachelor students (63.3%). Of the sample, 48.5% was native to the Netherlands, the average age of the participants was 23.5. The data was collected during 16 sessions, with up to 24 subjects participating in a single session. Sessions lasted about one hour, involving multiple different strategic games previous to the dictator game experiment. After playing these unrelated strategic games, subjects participated in 20 rounds of double-anonymous dictator games, where they were asked to divide a number of points between themselves and three other randomly selected subjects. Each round, the proposer would pick one of two different distribution allocations. Each round, the allocation options and the relative distribution between the players changed, prompting proposers to consider their options anew every round. Subjects were also asked to guess the choices of other participants, expressed as the percentage of participants who would choose option 1.

Instructions for the game were handed out on paper. The experimental games were played on computers. Participants were not allowed to communicate with one another. During every game, a timer would count down from twenty seconds to zero, encouraging subjects to make quick decisions. However after the timer reached zero, choices could still be made.. The experiment itself took about 5 minutes to complete. At the end of the session, points earned were paid out in cash. The participants earned 3.53 euros per game on average, which may have been a financial motivation for the subjects to participate (www.elseutrecht.nl).

Other possible motivations include a desire to help further sociological and economic science, or being motivated to participate by friends (79 participants had one or more friends in the room). A copy of the instruction form, including an example of two possible allocation options, is included in the Appendix.

After the game, participants filled in a questionnaire on the computer measuring demographic traits. The following demographic details were collected: gender, age, nationality, current study, the phase of said study, religion, and whether or not the participant: was a blood donor and/or organ donor, did volunteering work and whether they were a member of an association. Participants were also asked how many of the other current participants they knew by name. Participants were then presented with two additional series of questions, one concerning levels of trust and one concerning levels of empathy, in a fixed order. Questionnaires took approximately 10 minutes to complete. A copy of the questionnaire is included in the Appendix.

OPERATIONALIZATIONS

SOCIAL PREFERENCES

Choices made by the participants during the Dictator Game were used to calculate continuous social preferences scales. Each round, participants chose one of two allocation distributions dividing a certain amount of points (money) between themselves and three other players. Deciding between the allocation distributions is conceptualized as expressing a preference for either one. Thus, the results can be used to measure the relative weight a subject attributed to these outcomes . This is similar to the methods used by Aksoy and Weesie (2012).

Actions of the participants of the experiment were used to calculate the continuous scales 'alter outcomes' (symbolized as the Greek letter θ Theta), 'ego/alter inequality' (symbolized as the Greek letter β Beta) and 'alter inequality' (symbolized as the Greek letter γ gamma), ranging from -1 to +1. The 'alter outcomes' scale represents the relative importance a participant attributes to the value of the total outcome others receive. The 'ego/alter inequality' scale represents the relative importance attributed to the difference in outcomes between the participant and others, and the 'alter inequality' scale represents the relative importance a participant attributes to the difference in relative outcomes between others. These scales represent the relative importance participants attribute to specific combinations of outcomes over the course of twenty dictator games. Positive numbers indicate an increase in utility. A decrease in utility is expressed as a number below zero. If the participant is indifferent with regard to the outcomes of others, the scale is equal to zero. In order not to mistake a value slightly above or below zero as proof of social preference, values of alter outcomes, ego/alter inequality and alter inequality between -0.05 and +0.05 were recoded to zero. Using this method, 152 cases were modified. Alter outcomes (θ) is an ordinal indication of the relative importance of the average payoff received by others. It is a function of the weight a participant adds to the average income of other players. A positive value of alter outcomes indicates an increase in own utility from increased outcomes of others, while a value lower than 0 indicates a decrease in utility from increased outcomes of others.

Put simply, alter outcomes expresses the personal gain in utility from increasing the size of the pie distributed among other players (N=305, M=.106, SD=.29). Ego/alter inequality (β) is an indication of the relative importance of the distance between self and others. It is a function of the weight a participant adds to differences in income related to his own. A positive value of ego/alter inequality indicates an increase in utility from having a higher outcome than others, while a negative value indicates a decreased utility from having a higher outcome than others. Most participants scored negatively on ego/alter inequality, indicating a preference for reducing the average distance between self and others (N=305, M=-.095, SD=.134). Lastly, alter inequality (γ) indicates the relative importance of the average distance between other players. A positive value for alter inequality indicates an increase in utility when the inequality between other players is high, while negative alter inequality indicates a decrease in utility from inequality (N=305, M=-.113, SD=.119).

Taken together, these three scales form the utility function $U(x) = Xs + \theta \cdot Xt + \beta \cdot Xb + \gamma \cdot Xg$ where Xs is own outcome, Xt is the average outcome of the other players, Xb is the average difference in outcome between self and other players, and Xg is the average difference in outcome between other players. While a positive value for 'alter outcomes' indicates a preference for prosocial behavior (increasing the size of the pie), preferences for prosociality in ego/alter inequality and alter inequality are expressed as a negative value (wanting to reduce their respective forms of inequality). Thus, by subtracting both ego/alter inequality and alter inequality from alter outcomes, a combined continuous measure of social preferences 'TBG' can be constructed ($\theta - \beta - \gamma = TBG$). A higher value of TBG indicates more prosocial preferences, while lower values allude to self-interested preferences (N=305, M=.313, SD=.467).

FILTER

In order to test hypotheses concerning prosociality, a filter was constructed to select only those who displayed at least two out of three characteristics of prosociality: a positive value for alter outcomes (wanting to increase the size of the pie), a negative ego/alter inequality (wanting to decrease distance between self and others) or a negative alter inequality (wanting to decrease distances between other players). Participants who displayed only one prosocial characteristic scored almost exclusively negative on alter inequality (53 out of 62 cases), indicating a preference for inequality reduction. However, inequality reduction could be a side-effect of self-interested players striving to maximize their own gain, which leads to the minimization (and thus equalization) of other players' outcomes. Thus, these cases had to be excluded. 47.9 percent of the participants was deemed prosocial (N = 146). This comparable to the 46 percent of (prosocial) cooperators found by Au and Kwong (2004).

TRUST

An ordinal variable measuring the subject's levels of trust was measured using questionnaire data. Subjects were asked to what extent they agreed or disagreed on various statements such as *'I trust most people'* and *'I trust a person I know well more than one whom I don't know'*, categorized on a 6-point Likert scale. Since the dictator games are single-shot and completely anonymous, situational influences from perceived trust are controlled for (Scott, 1980). Only attitudinal trust can influence behavior in this setting. Thus, only questions measuring attitudinal trust were selected and subjected to principal component analysis. Some of these questions had been recoded so a higher value would correspond with a higher level of anonymous trust.

The Kaiser-Meyer-Olkin value was .77, exceeding the recommended value of .6 (Kaiser, 1970) . Bartlett's Test of Sphericity (Bartlett, 1954) also reached statistical significance, supporting factorability. Principal component analysis revealed the presence of three components exceeding 1, explaining 32.94%, 14.33% and 11.25% of the variance respectively. Scree plot introspection revealed a clear break after the first component, leading to the retention of only the first component's five items for analysis (Catell, 1966). With a Cronbach's Alpha of .744, these five items are reasonably reliable. The ordinal measure of anonymous trust 'trustfin' was computed using the centered average of these five items (N=305, M=3.331, SD=.760).

The cognitive and affective questionnaire developed by Reniers et al. (2010) was used to derive 31 questions measuring empathy. Subjects indicated the extent to which they agreed with statements as *'I get very upset when I see someone cry'* and *'It is hard for me to see why some things upset people so much' o*n a 7-point Likert scale. Six items were recoded to ensure higher values indicate a higher amount of empathy. All 31 items were combined and then centered to create the variable 'empaltcent' to measure a person's overall empathic ability (N=305, M=.000, SD=.450).

In order to find possible sub-scales of empathy, Principal Component Analysis and Factor Analysis was performed to differentiate between different forms of empathy (Määttä, 2006; Blair, 2005). Inspection of the correlation matrix revealed the presence of many coefficients above .3. The Kaiser-Meyer-Olkin value was .846, exceeding recommended values (Kaiser, 1970) and Bartlett's Test of Sphericity reached statistical significance, supporting factorability (Pallant, 2013).

Principal component analysis revealed eight components whose eigenvalues exceeded 1, but an inspection of the scree plot showed a break after the first four components. Parallel Analysis supported the selection of only the first four components: only these four had eigenvalues exceeding the corresponding criterion values for randomly generated data of the same size (31 variables x 305 subjects). This four-component solution explained a total of 47.022% of the variance, the different components contributing 23.049%, 11.140%, 7.695% and 5.138% respectively. Since five items loaded on multiple components, Varimax rotation was performed to aid the interpretation of the components. Three items were excluded due to loading significantly on multiple factors. The components found were mostly consistent with the sub-scales of empathy found by Reniers et al. (2010): 10 items loaded significantly on what Reniers et al. called 'Perspective Taking' and 7 items on 'Online Simulation', both sub-scales of cognitive empathy. 7 other items loaded significantly on a combination of Emotional Contagion (4 items) and Proximinal Responsivity (3). All of the components in this factor relate to persons close to you, confirming the expectation of Määttä (2006) and allowing us to operationalize the factor as 'Close Empathy'. The fourth component, containing only two items on 'Peripheral Responsivity', had to be discarded. Cronbach's α (Cronbach, 1951) for the selected three components were .88, .79 and .66, respectively. Items from the three components were used to construct three centered subscales of empathy: Perspective Taking (N=305, M=.000, SD=.762), Close Empathy (N=305, M=.000, SD=.920) and Online Simulation (N=305, M=.000, SD=.548).

METHOD OF ANALYSIS

Direct logistic regression was performed to assess the influence of prosocial preferences scale 'TBG' on four different binominal real-life measures of outcome, as well as the moderation of this relationship by anonymous trust and various forms of empathy. Each model contained five different independent variables: TBG, anonymous trust, the interaction between TBG and trust, a scale of empathy and the interaction between TBG and empathy, which were added step-by-step to judge the impact of each variable on the significance of the model as a whole. This procedure was executed four times, once for each of the dependent variables blood donorship, organ donorship, volunteering and association membership. Afterwards, the entire procedure was repeated three more times, substituting the main measure of empathy for the three different sub-scales of empathy, Proximal Responsivity, Close Empathy and Online Simulation. A filter selecting only prosocial subjects (N=94) was used during the linear regression. In addition, results without a filter or selecting only prosocials with or without friends were also computed.

RESULTS

In this chapter, the results will be presented and the hypotheses will be either accepted or rejected.

The results of our analyses are presented in Table 1 and Table 2. The full model containing all predictors for blood donation was not statistically significant, χ^2 (5, N = 146) = 9.30, p = .098, indicating the model was not able to distinguish between subjects who were and were not blood donors. As shown in Table 1, only Trust made a significant contribution to the model when added (p = .007), but it's effect became non-significant with the addition of further variables. The model including all predictors for organ donation was not statistically significant, χ^2 (5, N = 146) = 3.98, p = .552, indicating the model was not able to distinguish between subjects who were and were not organ donors. The model for volunteering was not statistically significant either, χ^2 (5, N = 146) = 10.117, p = .072. The model was not able to distinguish between subjects who did and did not engage in volunteering. As shown in Table 3, only Empathy made a significant contribution to the model when added to the regression (p = .007) but became non-significant when more variables were added. Finally, the model including predictors for association membership was not statistically significant, χ^2 (5, N = 146) = 2.90, p = .716, meaning the model was not able to distinguish between subjects who did and did not participate in volunteering.

Table 1

Results of stepwise addition of variables in logistic regression

Step	Measure	Blood donorship		Organ donorship		Volunteering		Association membership	
		Chi-Square	p	Chi-Square	p	Chi-Square	p	Chi-Square	p
1.	**TBG**	0.906	.341	.002	.969	2.109	.146	.051	.821
2.	**Trust**	7.245	.007*	1.331	.249	.233	.630	2.185	.139
3.	**TBG*Trust**	.785	.376	.043	.836	.237	.627	.331	.565
4.	**Empathy**	.268	.605	.147	.701	7.341	.007*	.327	.567
5.	**TBG*Empathy**	.094	.759	2.458	.117	.198	.656	.004	.948
	Constant	9.299	.098	3.980	.552	10.117	.072	2.898	.716

Note: for each step df = 1

Table 2

Results of logistic regression

Measure	Blood donorship			Organ donorship			Volunteering			Association membership		
	B	**S.E.**	**p**	**B**	**S.E.**	**p**	**B**	**S.E.**	**p**	**B**	**S.E.**	**p**
TBG	.435	.549	.428	-.130	.451	.773	.435	.461	.345	-.015	.472	.974
Trust	.249	.411	.544	.147	.318	.645	-.292	.324	.368	.117	.329	.722
TBG*Trust	.433	.511	.397	.087	.385	.822	.234	.384	.542	.215	.396	.586
Empathy	.015	.792	.985	-.781	.672	.245	.646	.709	.362	-.158	.693	.820
TBG*Empathy	-.297	.970	.759	1.326	.864	.125	.403	.909	.658	-.057	.878	.948
Constant	-1.491	.429	.001	.228	.344	.508	-.594	.354	.094	.662	.359	.066

Note: for each model df = 5

Hypothesis 1: There is a relationship between social preferences and prosocial behavior.

No significant relationship between TBG and any of the four outcome measures was found. Nor were there any significant interaction effects. Therefore, hypothesis 1 is rejected.

Hypothesis 2a: The relationship between social preferences and prosocial behavior is stronger for individuals with higher levels of attitudinal trust.
Hypothesis 2b: It is more likely that the relationship between social preferences and either form of donorship is stronger for individuals with higher levels of attitudinal trust, than is likely to be the case for the relationship between social preferences and volunteerism or association membership.

Although trust appears to have a significant effect on blood donorship, no significant interaction effect between TBG and trust was found. Both Hypothesis 2a and 2b are rejected.

Hypothesis 3a: The relationship between social preferences and prosocial behavior is stronger for individuals with higher levels of empathy.
Hypothesis 3b: It is more likely that the relationship between social preferences and volunteerism or association membership is stronger for individuals with higher levels of empathy, than is likely to be the case for the relationship between social preferences and either form of donorship.

Though Empathy did seem to have a significant effect on volunteerism, no interaction effect between empathy and TBG was found. Both hypotheses 3a and 3b are rejected.

Hypothesis 3c: It is more likely that the relationship between social preferences and association membership or volunteering is stronger for individuals with higher levels of close empathy, than is likely to be the case for the relationship between social preferences and either form of donorship.

None of the models including close empathy proved significant. When not filtering for prosocials, the model containing predictors for volunteering was significant, χ^2 (5, N = 305) = 12.650, p = .027, and specifically showed a significant effect of close empathy on volunteering (p = .019). However, none of the findings support the theory that close empathy affects the relationship between social preferences and any of the outcome measures. Hypothesis 3c is therefore rejected.

Hypothesis 3d: It is more likely that the relationship between social preferences and either form of donorship is stronger for individuals with higher levels of cognitive empathy, than is likely to be the case for the relationship between social preferences and association membership or volunteering.

Cognitive empathy was measured via the factors 'Perspective Taking' and 'Online Simulation'. None of the models including either form of cognitive empathy were significant. Hypothesis 3d is therefore rejected.

When not filtering to include only prosocials in the analyses, a significant relationship between both trust and blood donorship, χ^2 (5, N = 305) = 14.24, p = .014, and empathy and volunteering was found, χ^2 (5, N = 305) = 16.25, p = .006, with odds ratios of 1.435 and 2.473, respectively. However, these findings are unrelated to the purpose of this article.

DISCUSSION AND EXPLORATIVE ANALYSIS

This research failed to find any form of relationship between social preferences and behavior, the results being overwhelmingly insignificant. This allows two different conclusions to be drawn: either the theory of social preferences was flawed, or the methods used to research it were. Both will be discussed.

At first glance, one would call into question the validity of the prosocial preferences measures, since they could not be related to any measure of outcome. Yet social preferences have been proven to exist in experimental settings (List, 2007) as stable personality traits (Bogaert, 2008) consistent in a substantial part of the general population (Engel, 2011) even across different continents (Au & Kwong, 2004). It also relates to real life behavior, as proven by Franzen and Pointner (2013) and Carpenter and Seki (2011). A meta-study of 131 papers on dictator games by Engel (2011) found that, regardless of the experiment situation, the same results arise every time: people do not act purely selfish in dictator games, disproving *homo economicus* and encouraging researchers to extend economic theory by incorporating social preferences. Although the experimental model proved to be insignificant, the distributions of prosocials and proselfs found did match the "cooperators" and "individualists" of Au and Kwong (2004). Thus, the three scales used to quantify social preferences 'alter outcomes, 'ego/alter inequality' and 'alter inequality' seem reliable. Thus, the more urgent question would be: why didn't these social preferences relate to any measure of outcome?

Perhaps combining these three measures of social preferences into a single variable 'TBG' lies at the heart of the problem. Rather than compressing the three scales into one, losing information in the process, future research could run logistic regression on each of the three scales separately, or in tandem using multiple regression. Although Cronbach's Alpha of .714 indicated reasonable reliability of TBG, it does not guarantee proper construct validity (Pallant, 2013). Participants who differ in their utility concerning inequality of income should be expected to relate differently to measures of outcomes such as political voting.

This paper primarily focused on notions of pro- and asociality using the three different scales of social motivation, but other combinations of scales could be constructed just as easily. Participants who score zero on alter inequality behave differently from those who score significantly on all three scales, both in-game and (presumably) in real life. The participant who only scored zero on alter inequality would seem unconcerned with situations not primarily involving himself, which leads to less motivation for indirect forms of charity, such as organ donorship (Scott, 1980). By incorporating multiple measures of prosociality, such differences could be incorporated into the model, and the underlying mechanisms laid bare. In the first draft of this research, the authors accidentally included a large portion of proself participants in their sample of prosocials, which was corrected later on. Similarly, different groups of scale combinations are contained within the current set of prosocials even now.

Further research should strive to open this black box of social preferences measured by dictator games and explore how different combinations of motivations affect different types of outcomes. Both theory and modern computer should aid in this endeavor (Aksoy & Weesie, 2012). It also allows for older research to be revised or improved (Samuelson 2005).

Another point of criticism is one common to dictator games in general: the issue of priming (Engel, 2011). Prior to the dictator games conducted, participants engaged in strategic games for up to one hour. Experiments like McPherson et al. (2006) have shown previous activities can impact the participant's behavior. In this case, strategic influences could have caused the participant to perceive the one-shot games as repeated interactions, thereby moderating their behavior by, for example, making them less inclined to pursue proself goals on due to a 'shadow of the future' (Samuelson, 2005). But if priming effects did occur, all participants would have been affected equally, as each session ran the different experiments in the same order. Though systematic effects like circumstances, instructions and priming can affect the outcomes of dictator games, these effects can be expected to average out between participants on the same outcome variables. Thus, although the results can be shifted, the measured distribution of social preferences would remain the same (Engel, 2011). Floor- or ceiling-effects can be ruled out due to the social preferences scales being continuous. Priming effects thus cannot explain the lack of a relationship found between social preferences and behavior.

It should be addressed that a portion of the participants (N=79) had friends participating in the same experiment at the time of the game. This presence of friends introduces systematic bias to the anonymous dictator game: participants are expected to play more prosocially knowing the fellow player could be a friend (List, 2007). Likewise, participants are less inclined to brag about behavior like volunteering when their friends, who might know better, are in the room (Kramer & Wei, 1999), which could have influenced the data and thus explain the insignificant results. By means of explorative analysis, a simple independent sample t-test was conducted, showing no significant differences between participants with and without friends in the room. The possible presence of friends does not explain the lack of a relationship between social preferences and behavior.

Table 3
Results of explorative analysis t-test to measure the impact of friends

	Friends in room		**No friends in room**			
	Mean	Std. Dev	Mean	Std. Dev	t	p
TBG	,616	,419	,709	,380	-1,314	,191
Trust	3,032	1,0169	3,254	,987	-1,227	,222
Empathy	4,066	,551	3,918	,504	1,564	,120
Blood donorship	,186	,393	,281	,451	-1,207	,229
Organ donorship	,488	,505	,572	,497	-,931	,353
Volunteering	,465	,504	,427	,497	,418	,676
Association membership	,627	,489	,669	,472	-,484	,629

The dictator game, when executed properly, is devoid of strategic motivations, whereas real life behavior is filled with them (Cardenas & Carpenter, 2005; List, 2007). The more complex a situation, with more (strategic) factors weighing in, the less likely a proper transition from social preferences to behavior becomes. Yet when researching the external validity of laboratory measurements, one cannot avoid including strategic incentives, since a second set of (external) values is required (Franzen & Pointner, 2013). It can only be mitigated through the inclusion of additional variables (Bogaert et al., 2008; Penner, 2005). For this reason, the moderating factors trust and empathy were introduced in the theoretical model.

Although both variables had high internal reliability (Chronbach's Alpha = .744 and .822 respectively), neither could significantly moderate the relationship between social preferences and behavior. Future research could benefit from measuring differences in strategic motivations directly, through questionnaires or even strategic games in addition to the dictator games (Levitt & List, 2007).

An alternative approach would be to combine the four binominal measures of outcome into one single variable at the ratio level, ranging from 0 to 4. Exploratory analysis was conducted to see if this approach would have produced different results. Although this measure of social preference corresponded strongly with both trust and empathy, illustrating the strength of the measures of outcome, it failed to show a relationship to TBG. Thus, performing multiple regression with a combined measure of behavior would not have served as a viable substitute for logistic regression.

Instead, a different means of measuring behavior may be appropriate. Franzen and Pointner (2013) measured behavior by ostensibly misdirecting letters containing money to the participants, two months after the dictator games were played. Similarly, Carpenter and Seki (2011) achieved their results through field research. Rather than relying on self-reported data, future measures of outcome should focus on measuring actual behavior, although efforts have been made to combine the two (Levitt & List, 2007). Be it by registering participant activity over a month, giving participants the option to donate to charity when leaving the experiment room or simply asking participants to show their donor cards as proof. Using these methods should prove more effective for the external validation of social preferences.

DISCUSSION

In the present study the within-subjects relationship between social preferences as observed in Dictator Games and prosocial behavior outside the laboratory setting was examined. No significant relationship was found, nor were any moderating variables identified. Therefore it would seem that, on the face of it, social preferences in Dictator Games do not indicate a theoretical term which it is valid to relate to situations other than that of the experimental setting.

However, two aspects of the operationalization of the dependent variable, prosocial behavior, in the present study may have contributed to finding no significant statistical results concerning the examined relationships. Under the assumption that the employed measurement of social preferences is internally valid, these aspects of the examined measures of prosocial behavior could have confounded the relationships under investigation and must therefore be considered before drawing any strong conclusion concerning the external validity of social preferences. Despite being firstly introduced, to the betterment of the structure of this chapter, the discussion concerning these considerations will be reserved for the third following section.

Making the above-mentioned assumption, and also the further assumption that participants truly perceived the current one-shot experiment as though it were a one-shot interaction - as was intended, the present study could be interpreted as having found evidence for one of the four possible accounts of social preferences, on account of it having been possible to distinguish between groups of participants on the basis of their choices in the conducted Dictator Games. This point will be discussed first in the following section.

However, considering that the assumption that participants truly perceive one-shot social-dilemma experiments as one-shot interactions is not undisputed, for the sake of the argument this assumption will be dropped and the study's findings interpreted in relation to the other accounts of social preferences. This will be discussed in the second section.

In the fourth section, a preliminary conclusion will be drawn on the basis of the presented discussion and in light of the present study's findings.

Finally, while the aspects of the examined measures of prosocial behavior only threaten the hypothesized external validity of social preferences as specifically examined in the present study, there are two further points to be made concerning the employed experimental design, the problematic aspects of which have been common practice of the research into social preferences. These aspects of the employed experimental design may have threatened the internal validity of the examined measures of social preferences, which in turn would threaten the external validity of social preferences as presently and commonly measured. These considerations concerning the experimental design will be discussed lastly.

INTERPRETATION UNDER TWO ASSUMPTIONS

On the assumption that the operationalization of social preferences as employed in the current study - the constructed TBG scale – is a valid measure of social preferences, and on the assumption that participants really did perceive the conducted Dictator Games as one-shot interactions, considering the fact that a distinction could be made between participants

exhibiting social preferences (the prosocials) and participants exhibiting purely self-interested behavior (the proselfs) on the basis of the outcomes on the TBG scale, it can be concluded that the present study has either found evidence for (**E2**)1 the account of social preferences as put forward by Fehr and Henrich (2003), or for (**E4**) the account of social preferences as put forward by Kümmerli et al. (2010). This is so since only on these accounts, and on the above-mentioned assumptions, can it be explained that a differentiated categorization of the behavior of participants in the experiment can be made.

1 The reader's attention is directed to the schematic overview of the various accounts of social preferences (E1, E2, E3 & E4) in the Appendix.

Strictly speaking, on (**E4**) Kümmerli et al.'s (2010) account, the TBG scale would not be a valid measure of social preferences, since on this account the prosocial outcomes on the TBG scale would have to be interpreted as being caused by psychological drives, under the influence of which participants could not resist the urge to avoid 'extreme behavior' or 'irrevocable actions' (Kummerli et al., 2010). However this explanation of the outcomes of the TBG scale is deemed to be irrelevant to the current experiment, since it revolves around participants resisting distribution allocations which signify full cooperation (or defection). The distribution options presented to participants in the current experiment generally did not include an option to fully cooperate, and in any case the options dynamically varied as the experiment progressed, satisfactorily precluding the possibility that psychological drives as mentioned above could have had an influential effect on the outcomes of the experiment.

Therefore, on the above-mentioned assumptions, the account of social preferences as (**E2**) intrinsically motivated is the only currently existing possible explanation for the fact that in the present experiment participants could be categorized on the basis of the degree to which they exhibited social preferences. However, this leaves the absence of a statistically significant relationship between the outcomes on the TBG scale and the examined measures of prosocial behavior to be explained. The possibility that this relationship was confounded by the nature of the examined measures of prosocial behavior will be discussed in the next section. After doing so, the relevance of the observation that Fehr and Henrich's (2003) account (**E2**) is the only one – under the above-mentioned assumptions - that can explain observed social preferences in the context of one-shot interactions will be related.

INTERPRETATION UNDER ONE ASSUMPTION

In this section the aspects of the examined measures of prosocial behavior which could have confounded a statistically significant relationship with social preferences as measured by the TBG scale will be discussed. Also, since the assumption that participants actually perceive one-shot social-dilemma experiments as one-shot interactions remains disputed - as related in the theoretical framework, for the sake of the argument this assumption will be dropped in the interpretation of the results in the present section.

The discussion of the above mentioned aspects and interpretation of the results of the present study in light of participants having perceived the current experiment as if it were a repeated interaction will be presented together as they are interrelated.

To interpret the results of the present study in light of participants having perceived the current experiment as a repeated interaction, an auxiliary assumption could be made. This auxiliary assumption is that the TBG scale, besides possibly being a measure of intrinsic social preferences, could be an equally valid measure of the degree to which an individual exhibits prosocial behavior on the basis of strategic considerations in an experimental context of (perceived) repeated interactions (which is equivalent to exhibiting 'personal preferences'), and if an individual's predisposition to exhibit prosocial behavior on the basis of the under mentioned evolutionary mechanisms (equivalent to extrinsic social preferences) can be considered as ultimately being equivalent to such strategic considerations, then it there is a theoretically cogent reason to expect a relationship between the TBG scale and prosocial behavior on any account (except *E4*) . The theoretical argument for expected relationship is that if the TBG scale is a valid measure of the degree to which an individual exhibits prosocial behavior due to strategic considerations in an experimental context of repeated interactions, and if such an individual could be hypothesized to equally engage in prosocial behavior in 'real life' due to similar strategic considerations, then it must follow that the TBG scale will predict such prosocial behavior in 'real life'. Note that if this assumption is correct, it would in fact constitute a threat to the internal validity of the TBG scale as a measure of social preferences as presently conceptualized. However the difference between this threat to the TBG scale's internal validity and those to be discussed in a following section is that, assuming the TBG scale is an adequate measure of strategic considerations, this threat to the internal validity should not serve to confound the hypothesized relationship between the outcomes on the TBG scale and the examined measures of prosocial behavior.

Dropping the assumption of participants perceiving the experiment as a one-shot interaction and making the new auxiliary assumption creates the circumstance that the observed social preferences in the current experiment are not only interpretable in light of account *E2*, but also in light of (*E1*) the observed social preferences being due to evolutionary pressures as exerted by the mechanisms of kin selection, reciprocal altruism and/or indirect reciprocity, as well as in light of (*E3a/b*) the observed social preferences being due to strategic considerations, as both these accounts also predict being able to make a distinction between participants on the basis of the outcomes of the TBG scale. However, as in the previous section, this leaves the absence of a statistically significant relationship between the outcomes on the TBG scale and the measures of prosocial behavior to be explained. In the following section, the possibility that this relationship was confounded by the nature of the examined measures of prosocial behavior will be discussed in relation to each of the possible accounts of social preferences, beginning with (*E2*) Fehr and Henrich's (2003) account.

CONSIDERING THE MEASURES OF PROSOCIAL BEHAVIOR

The two aspects of the examined measures of prosocial behavior which could possibly confound a relationship between that which is measured by the TBG scale, be it intrinsic or extrinsic social preferences or personal preferences, and the examined measures of prosocial behavior are (*B1*)2 the circumstance that the examined measures of prosocial behavior might more accurately be viewed as indicative of having made the *decision* to engage in prosocial behavior and (*B2*) the circumstance that such a decision could arguably be seen as generally having been autonomously made by an individual, in isolation from any social group related influences, and without sorting an immediate effect. The rationale for how aspect *B1* would confound the

hypothesized relationship between outcomes on the TBG scale and the examined measures of prosocial behavior appropriates Cornelissen et al.'s (2011) finding that social preferences are (only) expressed automatically in behavior, as related in the theoretical framework. The rationale for how aspect *B2* would confound such a relationship centers upon the argument that while participants' decisions in the current experiment immediately dictate the outcomes of others, with the decisions being made in those others' presence, the examined measures of prosocial behavior could arguably be seen as decisions whose influence on others is more removed from the actual moment of making the decision, with the decision being made in isolation from those whom it affects. These two aspects will firstly be discussed in relation to account *E2*. They will subsequently be discussed in relation to the accounts *E1* and *E3a/b*.

2 A schematic overview of the various validity concerns as relating to the present study is provided in the Appendix.

In the following, it is assumed that the TBG scale is a valid measure of intrinsic social preferences as hypothesized under account *E2* and the aspect of the examined measures of prosocial behavior *B1* will be discussed. The presented arguments are deemed valid whether the assumption of participants perceiving the current experiment as a one-shot interaction is dropped or not. Cornelissen et al. (2011) find that social preferences are (only) expressed automatically in behavior. Such automatic behavior is seen as being due to an individual being sufficiently cognitively taxed so as to inhibit them from fully deliberating on their decision (Cornelissen et al., 2011). Having sufficient cognitive resources available would give an individual the opportunity to override their automatic decision in light of the contemporarily dominant social norm of acting self-interestedly (Cornelissen et al., 2011). In the current experiment, it is arguably the case that participants were sufficiently cognitively taxed, due to prior to participating having spent an hour playing other experimental social-dilemma games, to induce them to decide upon their preferred distribution allocations automatically. As the examined measures of prosocial behavior could more accurately be seen as a decision to engage in prosocial behavior, and since these decisions are likely to have been made through a process of deliberation, the resulting incongruence between participants' decision making process in the current experiment and their decision making process as relating to the examined measures of prosocial behavior could explain the absence of the hypothesized relationship between the outcomes on the TBG scale and the examined measures of prosocial behavior as found in the present study.

Aspect *B2* of the examined measures of prosocial behavior would confound the hypothesized relationship between outcomes on the TBG scale and said measures, since, as related above, the outcomes on the TBG scale arguably reflect decisions that immediately affected the outcomes of

others in whose presence the decisions were made, while this is unlikely to be the case for the examined measures of prosocial behavior. Since the intrinsic social preferences, of which the TBG scale is assumed to be a measure, as conceptualized under account *E2* were formed due to culture-gene coevolutionary pressures which acted upon individuals in relation to others, it could be argued that such intrinsic social preferences would equivalently only be expressed in situations in which an individual is in a direct relationship with others. If such an argument could be made, it would entail that there is an incongruence between the context in which decisions were made during the current experiment and the context of which the examined measures of prosocial behavior are indicative. Such an incongruence could also explain the

absence of the hypothesized relationship between the outcomes on the TBG scale and the examined measures of prosocial behavior as found in the present study.

Secondly, assuming that the TBG scale is a valid measure of extrinsic social preferences as hypothesized under account *E1*, and that the assumption of participants perceiving the current experiment as a one-shot interaction is dropped, similar arguments concerning the aspects *B1* and *B2* of the examined measures of prosocial behavior as were made above in relation to account *E2* could be made in relation to the assumed extrinsic social preferences under account *E1*. The only difference being that concerning the argument as pertaining to aspect *B1*, under these assumptions it are the mechanisms giving rise to extrinsic social preferences under account *E1* that operated in direct relation to others and the resulting extrinsic social preferences would equivalently only be expressed in relation to others. The arguments concerning the aspects *B1* and *B2* of the examined measures of prosocial behavior in relation to account *E1* could explain the absence of the hypothesized relationship between the outcomes on the TBG scale and the examined measures of prosocial behavior as found in the present study.

Thirdly, assuming that the TBG scale is a valid measure of personal preferences as hypothesized under account *E3a/b*, and that the assumption of participants perceiving the current experiment as a one-shot interaction is dropped, again similar arguments concerning aspect *B1* and *B2* of the examined measures of prosocial behavior could be made in relation to the assumed personal preferences. The *homo economicus* account (*E3a*) cannot be considered to be congruent with the assumption that participants perceived the current experiment as though it were a repeated interaction, at least not if such a perception were due to a maladaptation, as a *homo economicus* is assumed to govern complete rationality. The *homo economicus* account (*E3a*) *could* be considered congruent with participants under the above-mentioned perception if such were due to participants -while comprehending the one-shot nature of the interaction – viewing the anonymity condition of the experiment as not completely assured. However, it is deemed unlikely that such would be the case, as problems assuring the anonymity condition might realistically arise in a setting of small scale societies (Samuelson, 2005), but seems improbable in the current experimental setting. Yet, to the extent that an individual of bounded rationality who is ultimately self-interested – as assumed under account *E3b* - can be taken as a version of *homo economicus*, the gist of this admittedly unrealistic assumption might still be validated. Again the same arguments concerning aspect *B1* and *B2* of the examined measures of prosocial behavior could be made in relation to the assumed personal preferences. The only difference being that concerning the argument as pertaining to aspect *B1*, under these assumptions it is the reflexive learning process that is assumed under account *E3b* and by which the predilection to cooperate is acquired that operates in direct relation to others and the resulting personal preferences would equivalently only be expressed in relation to others. The arguments

concerning the aspects *B1* and *B2* of the examined measures of prosocial behavior in relation to account *E3b* could explain the absence of the hypothesized relationship between the outcomes on the TBG scale and the examined measures of prosocial behavior as found in the present study

Having related the above arguments and considerations it can be concluded that - on the assumption that the TBG scale is a valid measure of social preferences and the assumption that participants truly perceived the experiment as a one-shot interaction – the hypothesized relationship between (intrinsic) social preferences and prosocial behavior could still be found if aspect *B1* and *B2* of the examined measures of prosocial behavior were resolved. On the basis of the above discussion, to resolve the encountered problems with the examined outcome measures future research should consider using measures that are indicative of behavior as expressed automatically and in direct relation to a social group. On the above-mentioned assumptions and if the mentioned problematic aspects of the examined measures of prosocial behavior were to be resolved, it is thought likely that the hypothesized relationship between outcomes on the TBG scale and a measure of prosocial behavior should be found, and that if such a relationship were found it would constitute evidence of social preferences as (**E2**) conceptualized by Fehr and Henrich (2003).

However, if the assumption of participants perceiving the experiment as a one-shot interaction were dropped; if the mentioned problematic aspects of the examined measures of prosocial behavior were resolved; if the above-mentioned auxiliary assumption as pertaining to what the TBG scale is an equivalently valid measure of could be made; and if then a significant relationship between the outcomes on the TBG scale and a measure of prosocial behavior were found, excluding any of the three possible accounts **E1**, **E2** and **E3b** of social preferences would remain highly problematic. It is therefore paramount that in future validation research into social preferences the question of participants' perception of the nature of the interaction - whether it's perceived as one-shot or repeated - is conclusively resolved if any undisputed headway is to be made concerning the question of the external validity of social preferences, and consequently of the relevance of social preferences as a theoretical concept for economic theory.

Though the hypothesized relationship between social preferences as measured in the lab and prosocial behavior in 'real life' wasn't found, the present study hopes to contribute to the clarification of the question of the external validity of social preferences by having illustrated the concern that must be taken in choosing the measures of prosocial behavior to be examined, and also the great importance of resolving the question of participants' perception of as one-shot interactions intended social-dilemma experiments. In relation to the present study's design it remains to be said that the encountered problems with the examined measures of prosocial behavior could be circumvented by conducting a field experiment.

However, these conclusions are based on the assumption that the examined measure of social preferences, the TBG scale, is in fact a valid measure of said social preferences. In the following final section two aspects of the way in which social preferences are measured, in the present study but also generally, which could constitute a threat to the internal validity of measurements of social preferences will briefly be discussed. These aspects are relevant to the present study as a threat to the internal validity of the employed measurements of social preferences could very

possibly result in a threat to the external validity of the results of the current experiment. A threat to the internal validity of the TBG scale could therefore also explain the absence of the

hypothesized relationship between the outcomes on the TBG scale and the examined measures of prosocial behavior as found in the present study. The difference with the following considerations and the ones in the foregoing sections is that even if the problematic aspects of the presently examined measures of prosocial behavior were resolved, if the following considerations have had a large enough influence on the outcomes of the conducted experiment, resolving the problems with the measures of prosocial behavior would not lead to even hypothetically finding a significant relationship between the outcomes of the TBG scale and prosocial behavior.

INTERPRETATION UNDER NO ASSUMPTIONS

The two problematic aspects of the current experimental design, and such designs in general, which could constitute a threat to the internal validity of the social preferences measurement, are (A1) the participants' perception of the nature of the endowment and (*A2*) the possible influence of demand characteristics. First *A1* and subsequently *A2* will be discussed.

Participants' perception of the nature of the endowment could be problematic due to behavior, specifically giving behavior, arguably being significantly influenced by the nature of that which a participant is giving away. The incidence of money allocations from proposers to responders could have been positively influenced by the fact that the money was already freely given to the proposer in the first place (what might be considered a 'windfall') (Samuelson, 2005). It could be argued that in 'real life' an individual would be less motivated to share what they have themselves invested time and effort in, than for example money they have serendipitously found in the street. The windfall nature of the endowment could therefore have artificially inflated the number of incidences of positive allocations by proposers to responders, resulting in unrealistically high outcomes on the TBG scale. As the examined measures of prosocial behavior could be considered indicative of a personal investment on the part of the participant – to varying degrees, this incongruence between what constitutes prosocial behavior in the experiment and what was operationalized as constituting prosocial behavior in 'real life' could explain the absence of the hypothesized relationship between the outcomes on the TBG scale and the examined measures of prosocial behavior as found in the present study.

This threat to the internal validity of the TBG scale as a measure of social preferences could be considered moderate, as it seems likely that the influence of the nature of the endowment would have only served to inflate the outcomes of the experiment, yet wouldn't have caused participants to exhibit a different type of behavior. On this assumption, the outcomes of the TBG scale would still be valid to base a distinction on between participants concerning their behavior as prosocial or proself. Although of course this is an untested assumption, and the influence of participants' perception of the nature of the endowment could prove to be more significant.

The second problematic aspect of the experimental design is (*A2*) the possible influence of demand characteristics. The distribution allocation options presented to participants in the current experiment only included allocations over the positive domain: participants did not have the option to take money from responders. Indeed, in the current experiment responders weren't presented as even having any money the proposer might be inclined to take, but through a simple manipulation of experimental design and action set this possibility could have been

introduced. As the current experiment was set up though, it is possible that participants inferred that it was expected of them to give away some of their endowment, which could also have caused the number of incidences of positive allocations by proposers to responders to be artificially inflated, resulting in unrealistically high outcomes on the TBG scale. As it is unlikely that similar demand characteristics would have been operant at the moment a participant had decided to engage in one of the examined measures of prosocial behavior (and assuming participants answered the survey questions eliciting this information truly), it could be argued that there was an incongruence between the context in which a participants' behavior, on the basis of which their social preferences were scored, was observed and the context in which a participant decided upon engaging in prosocial behavior. This incongruence could explain the absence of the hypothesized relationship between the outcomes on the TBG scale and the examined measures of prosocial behavior as found in the present study.

This threat to the internal validity of the TBG scale as a measure of social preferences could be also be considered moderate, for the same reasons as discussed above in relation to *A1*. However, that the influence of demand characteristics would not have caused participants to exhibit a different type of behavior is similarly an untested assumption.

As a recommendation, these possible threats to the internal validity of social preferences measurements could be examined in future research in order to determine the degree to which they are able to exert an influence on the outcomes of employed measurements. This seems a necessary condition if researchers ever hope to claim the external validity of social preferences unchallenged.

These considerations illustrate the possible importance of the context in which one expects social preferences to manifest themselves, though as social preferences are currently modeled they are 'context free'. Examining the context in which decisions are made as a possible moderator of the expression of social preferences could prove a fruitful avenue for future research.

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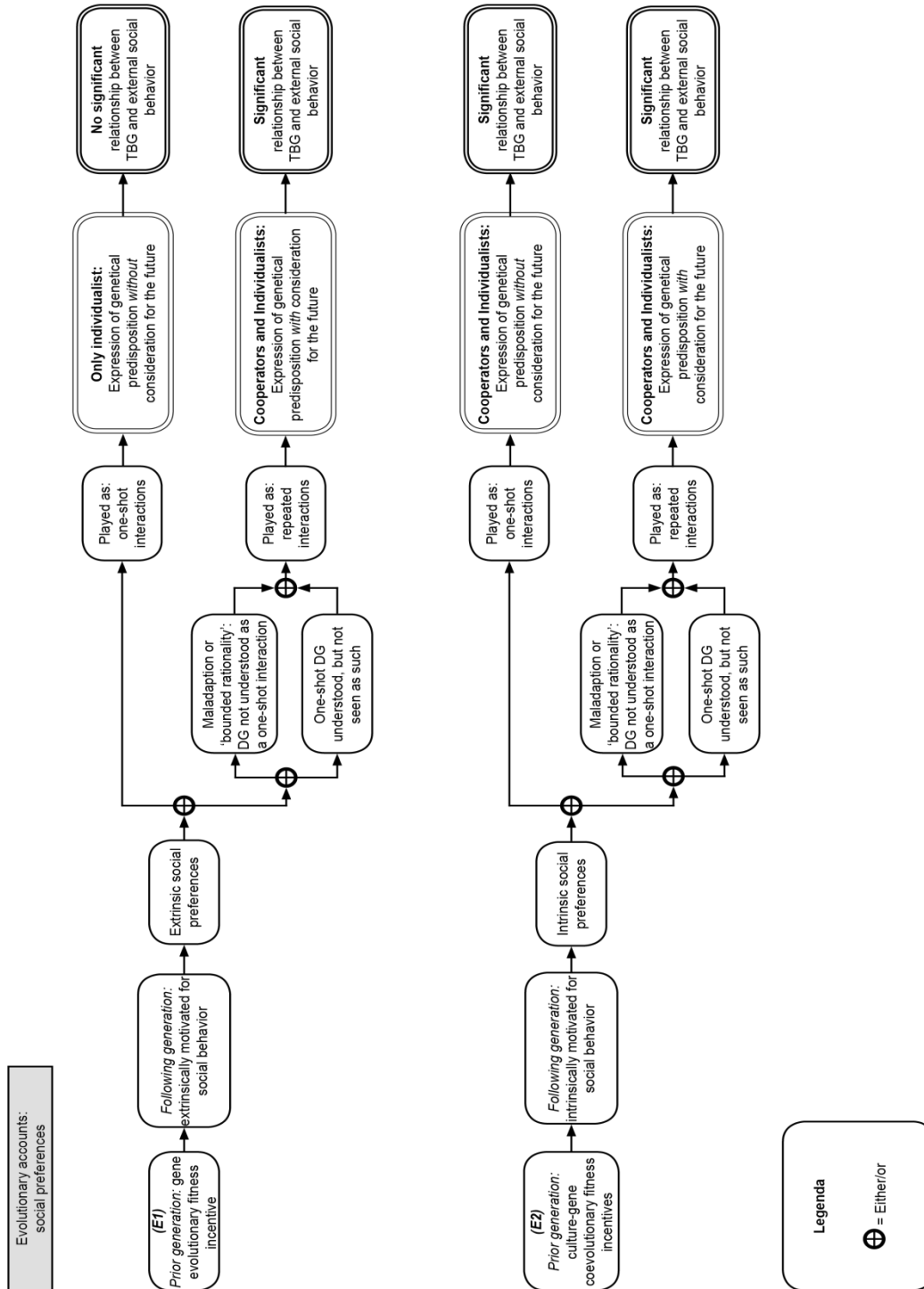Chang, H. J. (2014). *Economics: The user's guide: A pelican introduction* Penguin Books Limited. Retrieved from https://books.google.nl/books?id=93rAAgAAQBAJ

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APPENDIX

SCHEMES: EVOLUTIONARY ACCOUNTS OF SOCIAL PREFERENCES

SCHEMES: ALTERNATIVE ACCOUNTS OF SOCIAL PREFERENCES

Strategic account argument:

(E3a) *Homo economicus* (complete rationality)

(E3b) Reflexive learning (bounded rationality)

⊕ → Strategic considerations → Personal preferences → ⊕

Maladaption or 'bounded rationality': DG not understood as a one-shot interaction

One-shot DG understood, but not seen as such

⊕

Played as: one-shot interactions → **Only individualists:** utility maximization *without* considerations for the future → **No significant** relationship between TBG and external social behavior

Played as: repeated interactions → **Cooperators and Individualists** Utility maximization *with* consideration for the future → **Significant** relationship between TBG and external social behavior

Erroneous decision account: Neither self-interested, nor other-regarding

(E4) Experimental design without an 'error' control treatment

⊕

Played as: one-shot interactions

Played as: repeated interactions

⊕ → Psychological drives leading to imperfect behavior → **Cooperators and Individualists:** Cooperators due to avoidance of extreme behaviors or irrevocable actions → **No significant relationship** between TBG and external social behavior

Legenda

⊕ = Either/or

SCHEME : VALIDITY & DISCUSSION

Scheme 2.

GRAPH 1 - SCREE PLOT OF VARIABLES MEASURING ANONYMOUS TRUST

Scree Plot

[Scree plot: Eigenvalue (y-axis, 0,0 to 3,0) versus Component Number (x-axis, 1 to 9). Values descend from approximately 2,97 at component 1, 1,29 at component 2, 1,02 at component 3, 0,85 at component 4, 0,77 at component 5, 0,63 at component 6, 0,59 at component 7, 0,52 at component 8, and 0,37 at component 9.]
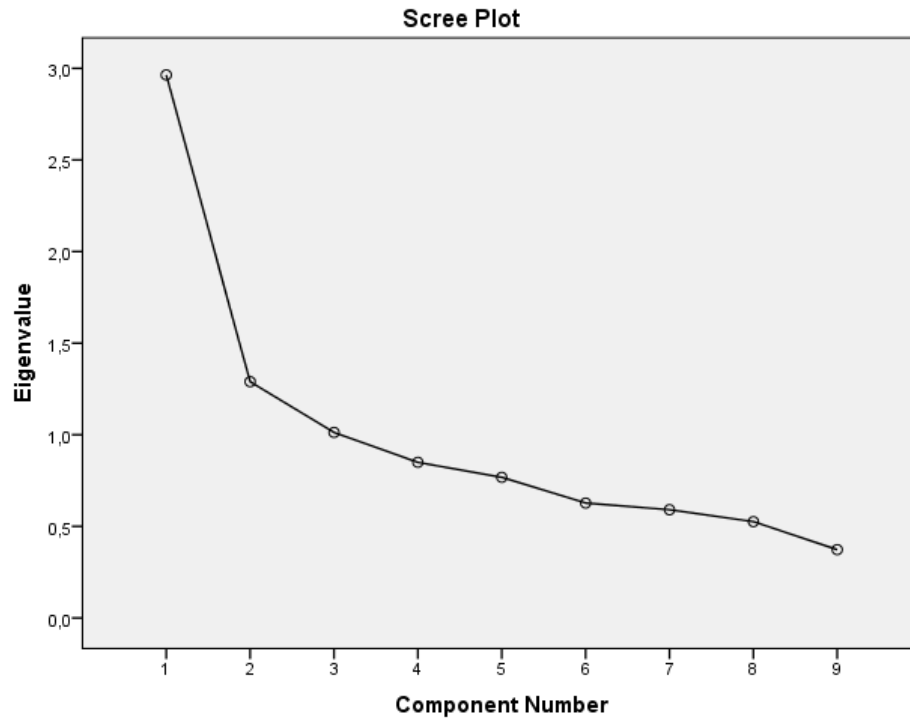
Table 1

Component Matrix for anonymous trust

	Component 1	Component 2	Component 3
yy1 Most people are basically honest.	**,704**	-,051	-,229
yy2new	**,483**	-,129	**,561**
yy5new	**,485**	-,127	**,627**
yy6 Most people are trustworthy.	**,787**	-,081	-,166
yy7 I don't want to act dishonestly under any circumstances.	,279	**,755**	-,103
yy8 In this society one does not need to be constantly afraid of being cheated.	**,585**	-,246	-,323
yy20 I trust most people.	**,699**	,118	-,237
yy23new	**,568**	-,346	,020
yy25 I am trustworthy.	,388	**,696**	,230

Note: major loadings for each item are bolded.

Table 2

Chosen variables measuring anonymous trust

Item No.	Item Content	Mean	Std. Dev
yy1	Most people are basically honest.	3.22	1.395
yy6	Most people are trustworthy.	3.46	1.227
yy8	In this society one does not need to be constantly afraid of being cheated.	2.93	1.566
yy20	I trust most people.	3.53	1.395
yy23	In this society, one has to be alert or someone is likely to take advantage of you.	2.331	1.282

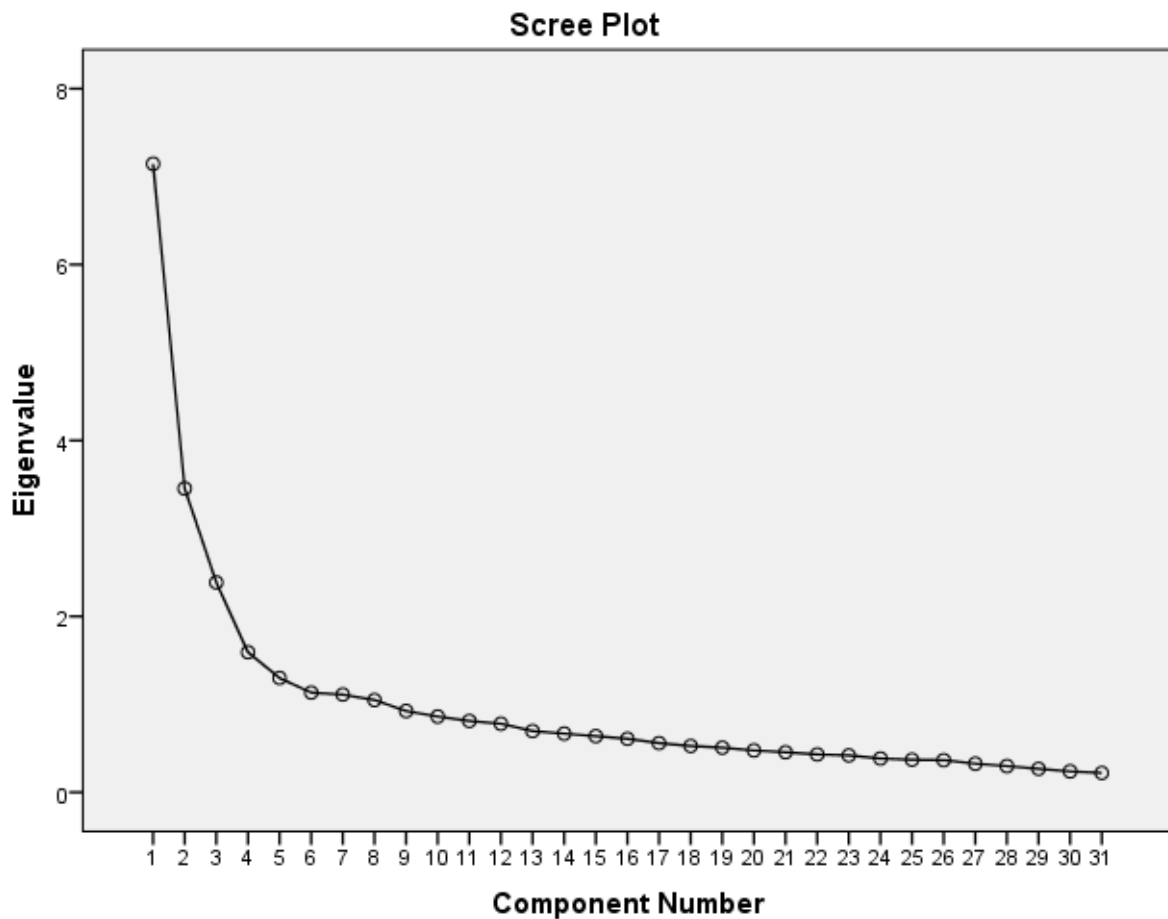## EMPATHY: FACTOR ANALYSIS

GRAPH 1 – SCREE PLOT OF VARIABLES MEASURING EMPATHY

Table 1

Nonrotated component loadings for 31 empathy items

Item No.	Component							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
qcae1	,357	-,305	-,184	**,535**	,330	,154	,240	-,105
qcae2	,129	,355	,385	**,584**	-,251	,200	,042	-,090
qcae3	**-,483**	,213	**,459**	-,099	-,006	,322	-,122	,039
qcae4	**,605**	-,088	-,356	,054	,015	-,298	,205	,043
qcae5	**-,461**	,015	**,550**	-,058	,331	-,067	,059	,101
qcae6	**,482**	,083	**-,549**	,030	-,261	-,046	-,186	-,044
qcae7	**,475**	**,427**	,026	-,045	,143	-,212	-,104	,115
qcae8	,276	,583	,058	-,072	,077	-,263	-,197	-,120
qcae9	,233	**,573**	,089	-,134	,204	-,218	,345	-,141
qcae10	**,514**	**,496**	,046	-,018	,273	-,131	,055	,031
qcae11	,349	**,494**	,227	,287	-,274	-,174	-,100	-,066
qcae12	,301	**,650**	-,010	,055	-,101	,184	-,148	-,022
qcae13	,125	**,569**	,007	-,192	,127	,431	,302	-,064
qcae14	,221	**,647**	-,112	-,242	,108	,348	-,047	-,041
qcae15	**,597**	-,162	,296	,000	-,029	,122	,216	-,012
qcae16	**,508**	-,273	,388	-,046	-,179	-,046	,274	-,168
qcae17	,222	-,272	-,056	,359	**,519**	,281	-,194	,188
qcae18	**,663**	-,132	-,204	,267	,093	,210	-,017	-,157
qcae19	**,669**	-,313	,129	-,022	,047	,018	,023	-,230
qcae20	**,606**	-,223	,240	-,002	-,205	-,068	,297	-,121
qcae21	**,757**	,003	,047	-,048	,217	-,093	-,036	,071
qcae22	**,578**	-,175	,206	-,169	-,012	-,006	-,114	,387
qcae23	**,691**	,028	,121	-,060	,283	-,146	-,052	,197
qcae24	**,531**	-,230	,236	-,075	-,071	-,013	-,203	,295
qcae25	**,652**	-,178	,232	-,180	-,110	,170	-,229	,115
qcae26	**,613**	-,128	,318	-,083	-,012	,097	-,090	-,121
qcae27	**,502**	-,273	,194	-,315	-,148	,131	-,210	-,321
qcae28	,316	,066	-,313	,089	,120	-,036	-,367	-,369
qcae29	,094	,323	,229	**,541**	-,270	-,097	-,011	,327
qcae30	**,432**	,060	-,479	-,030	-,253	,234	,062	,250
qcae31	,356	,100	-,373	-,244	-,146	,157	,330	,287

Note: major loadings for each item are bolded.

Table 2

Obliquely rotated component loadings for selected empathy items

Item No.	Item Content	Perspective Taking 1	Close Empathy 2	Online Simulation 3	Peripheral Responsivity 4
qcae2	I am usually objective when I watch a film or play, and I don't often get completely caught up in it.	,078	,199	-,159	**,766**
qcae3	I try to look at everybody's side of a disagreement before I make a decision.	-,227	,111	**-,652**	,071
qcae4	I sometimes try to understand my friends better by imagining how things look from their perspective.	,335	,049	**,632**	-,006
qcae5	When I am upset at someone, I usually try to "put myself in his shoes" for a while.	-,088	-,007	**-,750**	-,042
qcae6	Before criticizing somebody, I try to imagine how I would feel if I was in their place.	,077	,106	**,760**	,030
qcae7	I often get emotionally involved with my friends' problems.	,248	**,522**	,240	,200
qcae8	I am inclined to get nervous when others around me seem to be nervous.	,054	**,627**	,068	,118
qcae9	People I am with have a strong influence on my mood.	,056	**,681**	-,031	-,028
qcae10	It affects me very much when one of my friends seems upset.	,270	**,640**	,192	,127
qcae12	I get very upset when I see someone cry.	-,005	**,636**	,168	,262
qcae13	I am happy when I am with a cheerful group and sad when the others are glum.	-,062	**,664**	-,039	-,047
qcae14	It worries me when others are worrying and panicky.	-,069	**,746**	,114	-,058
qcae15	I can easily tell if someone else wants to enter a conversation.	**,674**	,066	,058	,097
qcae16	I can pick up quickly if someone says one thing but means another.	**,687**	-,075	-,032	,090
qcae17	It is hard for me to see why some things upset people so much.	,216	-,201	,155	,166
qcae19	I am good at predicting how someone will feel.	**,709**	-,040	,214	-,063
qcae20	I am quick to spot when someone in a group is feeling awkward or uncomfortable.	**,670**	-,026	,151	,130
qcae21	Other people tell me I am good at understanding how they are feeling and what they are thinking.	**,636**	,261	,332	,026
qcae22	I can easily tell if someone else is interested or bored with what I am saying.	**,638**	,061	,129	-,031
qcae23	Friends talk to me about their problems as they say that I am very understanding.	**,612**	,279	,230	,037
qcae24	I can sense if I am intruding, even if the other person does not tell me.	**,619**	-,034	,092	,008
qcae25	I can easily work out what another person might want to talk about.	**,706**	,069	,149	-,003
qcae26	I can tell if someone is masking their true emotion.	**,693**	,110	,046	,057
qcae27	I am good at predicting what someone will do.	**,625**	-,015	,079	-,229
qcae28	I can usually appreciate the other person's viewpoint, even if I do not agree with it.	,071	,111	**,429**	,017
qcae29	I usually stay emotionally detached when watching a film.	-,012	,102	,022	**,806**
qcae30	I always try to consider the other fellow's feelings before I do something.	,088	,108	**,657**	-,008
qcae31	Before I do something I try to consider how my friends will react to it.	,097	,224	**,463**	-,222

Note: major loadings for each item are bolded.

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– Instructions for second part of the experiment –

Please read the following instructions carefully. If you have any questions, please raise your hand. One of the experimenters will approach you in order to answer your question. We kindly remind you that you are not allowed to communicate with other participants. Note that these instructions are the same for all participants.

– Overview –

This part of the experiment consists of 21 rounds. Each round, you are matched with other participants, to whom you can give away points. Other participants are also matched to you, and you will be receiving points from them as well. It is possible to meet the same person twice during the course of the experiment, but this probability is very small. It will not be made public to whom you are matched.

– Earnings –

At the end, you will have made a decision in each of the rounds. One of them is randomly selected and you will be paid the number of points you earned in this round - both given and received -, according to the following exchange rate:

150 Points = 1 Euro

Your earnings will be paid out in cash at the end of the experiment, together with the earnings in the previous part of the experiment. Other participants will not be able to see how much you earned.

– 1. First phase (20 rounds) –

This phase consists of 20 rounds, in which you are matched with **three** other participants, we will call Player A, B and C. These players are randomly chosen each round. You will see two options on how to distribute points between yourself and the other players. See the example below:

Option 1		Option 2	
You:	300 points (50%)	You:	100 points (25%)
Player A:	100 points (17%)	Player A:	100 points (25%)
Player B:	100 points (17%)	Player B:	100 points (25%)
Player C:	100 points (17%)	Player C:	100 points (25%)
Total:	600 points (100%)	Total:	400 points (100%)

Which option do you choose?

Option 1   Option 2

The task is to choose between these options, by clicking the corresponding button. You will receive the number of points associated with the selected option. Furthermore, you will obtain points from the choices of three other participants, to whom you are either Player A, B or C.

Finally, we ask you to guess the choices of other participants on this question. Please give your answer as the **percentage** of participants choosing **option 1** (0 – 100).

What is your prediction?

The percentage of participants that choose option 1 (0-100) :

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– 2. Second phase (1 round) –

This phase consists of 1 round, in which you are randomly matched with **one** other participant. You will see two options on how to distribute points between yourself and the other players. See the example below:

Again, the task is to choose between these options, by clicking the corresponding button. You will receive the number of points associated with the selected option. Furthermore, you will obtain points from the choices of the other participant.