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## Social Capital: Experimental validation of survey measures

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2023 / 03

# **Social Capital: Experimental validation of survey measures**

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## **Abstract**

The social fabric, generally recognized as essential for economic and social transactions, is often referred to as Social Capital (SC). In this paper, we explore to what extent inexpensive survey data can be a substitute for more expensive experimental data as a metric of SC, using a cross-country design. We use data from two standard subject pools (located in Spain and France) and a mixed-method approach in the sense of presenting validated survey questions from the SC section of the latest wave of World Values Survey (WVS) to our participants, in addition to games for eliciting SC through actions and beliefs. Our data can be compared to publicly available WVS data at the relevant regional level as well as the national level. The main takeaway from our study is that SC measured by survey items consistently is higher in Spain than in France regardless of item and spatial resolution (nation, region, lab), whereas SC measured by choices and beliefs in incentivised games consistently is higher in France. This may confirm that there is reason for scepticism concerning the validity of survey measures in the context of social capital, not least since we, as opposed to in earlier studies, have data on group specific items used in the latest wave of WVS pertaining to trust in personal relations as well as more distant relations, all consistently pointing in the same direction regardless of spatial resolution. In this version of the paper we are concentrating on aggregates. Work remain to be done on the individual level.

**Keywords:** social capital; mixed-method; cross-cultural; lab experiments.

**JEL classification:** Q12; C22; D81.

# Social Capital: Experimental validation of survey measures \*

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## Abstract

The social fabric, generally recognized as essential for economic and social transactions, is often referred to as Social Capital (SC). In this paper, we explore to what extent inexpensive survey data can be a substitute for more expensive experimental data as a metric of SC, using a cross-country design. We use data from two standard subject pools (located in Spain and France) and a mixed-method approach in the sense of presenting validated survey questions from the SC section of the latest wave of World Values Survey (WVS) to our participants, in addition to games for eliciting SC through actions and beliefs. Our data can be compared to publicly available WVS data at the relevant regional level as well as the national level. The main takeaway from our study is that SC measured by survey items consistently is higher in Spain than in France regardless of item and spatial resolution (nation, region, lab), whereas SC measured by choices and beliefs in incentivised games consistently is higher in France. This may confirm that there is reason for scepticism concerning the validity of survey measures in the context of social capital, not least since we, as opposed to in earlier studies, have data on group specific items used in the latest wave of WVS pertaining to trust in personal relations as well as more distant relations, all consistently pointing in the same direction regardless of spatial resolution. In this version of the paper we are concentrating on aggregates. Work remain to be done on the individual level.

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## 1 Introduction

The social fabric, generally recognised as essential for economic and social transactions, is often referred to as Social Capital (SC), loosely defined as shared values and social beliefs that help groups to coordinate and cooperate (see Farr, 2004, for a conceptual history). High SC in a place is associated with mostly favorable outcomes in a long range of domains. Admittedly, this is partly tautological, since SC in some traditions is defined functionally (see Durlauf, 2002, for a critical review).

In this paper we empirically explore the relationship between Place and SC. To make this more precise we define two places as different if they differ in the degree of *parochialism*. It has been suggested that parochial communities tend to enhance pro-social behaviours related to mechanisms due to restricted mobility (Bowles & Gintis, 1998). Hence, different places should tend to differ in the level of SC. It therefore makes sense to employ a spatial comparative approach (Fischer & Poortinga, 2018), often referred to as a cross-cultural approach in the experimental literature. Consequently, we have chosen to gather

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data from two student populations (rather than one) from two specific places believed to be different. Using the proportion of individuals in the two samples reporting having lived in the place all their lives as a measure of parochialism, we validate that the two are indeed different according to our measure.

SC is a multifaceted elusive concept as discussed by, e.g., Glaeser, Laibson, Scheinkman, and Soutter (2000), and Durlauf (2002c). To clarify, Carpenter, Danieri, and Takahashi (2004) introduced a distinction between what they called Behavioural Social Capital (BSC) (the propensities of individuals to trust and cooperate, and punish those who fail to do this), and Associational Social Capital (ASC) (the community level networks among individuals that lead to efficient outcomes when contracts are hard to enforce). ASC is clearly related to SC as conceptualized in the Putnam tradition focusing on connections rather than individuals (Putnam 1993; Putnam 2000), whereas BSC, focusing on individual actions and beliefs, has often been favored by economists. A less noticed, equally interesting, dichotomy is based on the meaning of the social relations embedding SC: personal relations and relations with strangers (Torche & Valenzuela, 2011). We will return to this particular distinction later.

Acknowledging the multifaceted nature of SC, we consider separately both types of SC suggested by Carpenter et al. (2004), but also by speaking to the distinction between SC embedded within personal relations vs within relations with strangers. We have data on all levels of spatial resolution for relevant survey items (as opposed to ASC where WVS does not provide data for either Spain or France). The different facets of SC is elicited through the externally validated survey questions as well as by playing multiple games in the laboratory that make it possible to distinguish between different pro-social mechanisms. In short, we take advantage of methodological triangulation (sometimes called a mixed-method approach).

The rest of the paper is organised in 6 sections. Section 2 presents the overall methodology, and Section 3 offers details on the games being played. Section 4 contains details on design of the survey part and the experimental part. Results are presented in Section 5, followed by some concluding remarks in Section 6. In addition, there is an extensive appendix containing experimental instructions and a complete set of screenshots walking the reader through the experiment as seen from the subject perspective.

## **2 Methodology**

Empirical SC studies have mostly been based on aggregate survey data. Survey data are in general relatively inexpensive and fast to collect which may be one reason for the popularity. On the other hand, there is concern about validity since data are non-incentivised answers to hypothetical questions (see, e.g., Falk, Becker, Dohmen, Huffman, & Sunde, 2023, for a recent discussion). SC studies have therefore also been based on other data collected through lab and field experiments generating incentivised choices and beliefs. Following Carpenter et al. (2004), Thöni, Tyran, and Wengström (2012), and Bigoni, Bortolotti, Casari,

Gambetta, and Pancotto (2016), we use both types of data.

Let us start by discussing the specific survey approach that is used before turning attention to the experimental approach. We use the exact same survey questions as used in the World Values Survey (WVS) in the section on SC (the most recent Wave 7). Hence, our survey items are externally validated and can be compared to relevant aggregate data from the WVS. These are based on representative samples on the national level but are also broken down on the regional level (the European NUTS2 level). Although we are not particularly interested in the places we have chosen for the cross-country design per se, the validation against WVS data requires that they are geo-referenced. We are using samples from Castellon (Spain) and Nice (France). We will return to details on the cross-country approach in the section on design.

Data from WVS are readily available online. We have selected items that seem particularly relevant for BSC. Details on the specific items will be elaborated upon in the section on design. Here, we only offer some more general remarks. The items on BSC can be classified into two categories reflecting the personal-stranger dichotomy discussed by Torche and Valenzuela (2011), building on Mauss (1967) and Simmel (1950) The use of experimental data complements survey data by providing incentivised choices and beliefs eliciting preferences. To the extent that comparable survey answers and experimental behaviour is in agreement, we may consider the survey item validated. See the call for further research on this topic in Falk et al. (2023).

Furthermore, using (in part) repeated measurement by allowing the same individual to play different games in our experiments, we obtain several measures for pro-social behaviour. As emphasized by Yamagishi et al. (2013), we should expect some level of consistency to the extent that pro-social behaviours are driven by internal traits such as social preferences or Social Value Orientation. Repeated measurement makes it in principle possible to assess the level of consistency. On a related note, it has also been suggested that using a single measure (choices in a single game) may explain why psychological research has only found modestly relatedness to pro-social personality traits and that aggregation over multiple game behaviours indicate a stronger relationship (Haesevoets, Reinders Folmer, & van Hiel, 2022).

All our games represent social dilemmas in the sense that they involve costly actions that confer benefits on other players. This may be seen as a consequentialist (as opposed to an intentionalist) definition of pro-sociality (as opposed to pro-selfishness). More specifically, we let all subjects play 3 different two-players one-shot games with a stranger-matching design: the Prisoner's Dilemma (PD), the Trust Game (TG), and the Ultimatum Game (UG). The PD and the TG that we use share the property of simple binary choices. The UG on the other hand allows the player in the first position to offer any integer amount between 0 and 20 euros to the player in the second position, whereas the second position player can accept or reject (again binary). The PD is simultaneous so both players will have to base their choice on beliefs about what the opponent will do. The TG and UG are both sequential so the second position player will know what the first player has actually

chosen. This distinction has important implications for identification of pro-social mechanisms: altruism, direct positive reciprocity, or strong positive and negative reciprocity.

Altruism can be broadly defined as a mechanism where people help others without expecting anything back in material terms (elicited in the PD and by first position (trustor) pro-social behaviour in the TG, conditional on believing the opponent to defect or abuse the trust). Direct positive reciprocity is a mechanism where people help those who have helped them in the past (elicited by second position (trustee) behaviour in the TG). Strong negative reciprocity is a mechanism where people punish unkind behaviour at a personal cost in material terms (elicited by second position (responder) behaviour in the UG). Strong positive reciprocity is a mechanism similar to altruism but conditional on believing to be reciprocated (elicited in the PD and by trustor behaviour in the TG).

Torche and Valenzuela (2011) have a somewhat different understanding of reciprocity. They define reciprocity as the social capital embedded in personal relations and trust as SC embedded in relations with strangers. Although we have an anonymous one-shot stranger-matching design that is a framework particularly geared towards what they call trust, the trustee behaviour in the sequential TG may be interpreted as rather speaking to what they call reciprocity since the trustee has received something and therefore does not qualify as a stranger: 'We define the stranger as the opposite of the personal relation. If personal relations are defined by presence, reciprocity and memory; the stranger is one who is not present; one from whom I have received nothing, and therefore to whom I owe nothing; and one with whom I do not share a common memory. In contrast to the Simmelian definition of the stranger as 'that who has not belonged to the group from the beginning and therefore imports qualities into it' (Simmel, 1950, p.402), we define the stranger as that who I have not personal obligations with because I have not received anything from him' (Torche & Valenzuela, 2011, p.189).

Strong positive reciprocity may be particularly relevant for explaining pro-social behaviour in modern societies. Direct reciprocity as a pro-social mechanism is often associated with a social context typical for small traditional societies where kinship and personal ties are strong and reputational concerns through repeated interaction are important. Explaining pro-social behaviour in an anonymous context, typical in modern urbanised societies where the role of kinship and personal ties are presumably weaker, has proved to be more challenging (Gächter and Herrmann 2009; Rand and Nowak 2013). Our one-shot stranger-matching design is aimed at addressing this challenge.

Gächter and Herrmann (2009) review experimental evidence on (direct, indirect, and strong) reciprocity as a determinant of cooperation and punishment. Beside reviewing the literature, they also add to the empirical literature on strong reciprocity using an experimental design with a cross-cultural within-subject design similar to ours in some respects (but different in others). We will return to this in the section on design. Rand and Nowak (2013) review more broadly theory and evidence on reciprocity and other mechanisms (selection mechanisms) for explaining human cooperation, foremost in an evolutionary perspective. Recently, an entire special issue of the journal *Current Opinion in Psychology*

was devoted to pro-sociality, with contributions ranging from conceptual discussions to reviews of empirical work (Thielmann & Pfattheicher, 2022). Examples of topics of particular interest for this paper include direct and indirect reciprocity (Romano, Seyhun Saral, & Wu, 2022), altruism (Pfattheicher, Nielsen, & Thielmann, 2022), reward and punishment (Wu, Luan, & Raihani, 2022), measurement through aggregation of game behaviour (Hae-sevoets et al., 2022), and cooperation in the cross-national context (Dorrrough, Froehlich, & Eriksson, 2022).

### 3 Playing Games

Among cooperative social dilemmas, the one most challenging for cooperation, according to Rand and Nowak (2013), is the prisoner’s dilemma (PD). Let us explain in what sense this claim is warranted. It is useful to consider the generic payoff matrix presented in Table 1.

Table 1: Payoff matrix: Social dilemmas

		<b>Player 2</b>	
		<i>Cooperate</i>	<i>Defect</i>
<b>Player 1</b>	<i>Cooperate</i>	$(R, R)$	$(S, T)$
	<i>Defect</i>	$(T, S)$	$(P, P)$

We have a social dilemma if  $R > P$  and there is an incentive to defect which is fulfilled if a)  $T > R$  (better to defect when playing against a cooperator), or b)  $P > S$  (better to defect when playing against a defector), or c)  $T > S$  (better to defect when playing against a cooperator than cooperating when playing against a defector). If none of these conditions are fulfilled, there is no dilemma: cooperating is always better than defecting. If all conditions are fulfilled, then  $T > R > P > S$  and we have a PD. With the specific payoffs we use:  $28 > 20 > 10 > 0$ .

Pro-social behaviour is revealed by choosing cooperation in the PD. If you choose to cooperate conditional on stating that you believe the opponent will also cooperate, then you will be counted as a strong positive reciprocator. If you state you believe the opponent will defect, you will not be a reciprocator but an altruist according to our definition.

It may be argued that stated beliefs are not observables and cannot be trusted in the same way as observable choices (see, e.g., Clark & Sefton, 2001). The Trust Game (TG) is sequential and second position behaviour is based on observables: as a trustee, you observe the trustor’s choice to trust or not and can honour the trust (positive direct reciprocity reflecting pro-social behaviour) or abuse the trust (Nash play or pro-self behaviour). Our Trust Game is close to the original TG proposed by Krebs (1990), that has been studied experimentally by, e.g., Bohnet and Huck (2004). Essentially, we have the same binary game as Krebs, but we have rescaled payoffs to mimic the pro-social outcome and the pro-self outcome in the PD. The TG on extensive form is illustrated in Figure 1.



We may investigate how consistent individual pro-social play is across the two games and thereby validate the strength of pro-social traits. To further validate that the PD and the TG are indeed comparable in terms of eliciting the same underlying disposition for pro-sociality, we may also look at first position behaviour in the TG. In this case, subjects act in the role as trustor and are first stating their beliefs about the opponent's choice (just as in the PD) and then choosing trust or not. Choosing trust conditional on a stated belief about the opponent reciprocating, is again a measure of strong positive reciprocity as much as that obtained in the PD. This is not surprising: the first part of the TG has been described as "a one-sided version of the well-known prisoner's dilemma game" (Krebs, 1990, p.101). And, incidentally, the second part is similar to a dictator game (Berg, Dickhaut, & McCabe, 1995, p.127).

It is not only possible to compare the within-subject consistency across games, but also the between-subject consistency of pro-social play at the aggregate level in the TG since half of the subjects play the role of being in the first position and the other half in the second position (strong positive reciprocation vs direct positive reciprocation). We may also possibly tease out something about a potential link between positive direct reciprocity in one game (second position role in the TG) and strong positive reciprocity in another (the PD). This may be related to the idea that direct reciprocity is sometimes overgeneralized, spilling over into situations where direct reciprocity is not feasible (Rand & Nowak, 2013).

Table 2: Payoff matrix: Prisoner's Dilemma

		Player 2	
		<i>Cooperate</i>	<i>Defect</i>
Player 1	<i>Cooperate</i>	(20, 20)	(0, 28)
	<i>Defect</i>	(28, 0)	(10, 10)

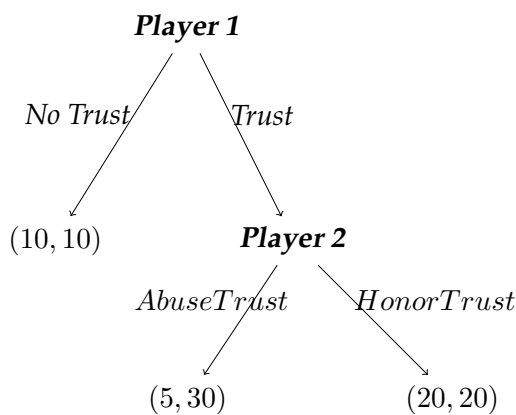


Figure 1: Decision tree: Trust Game

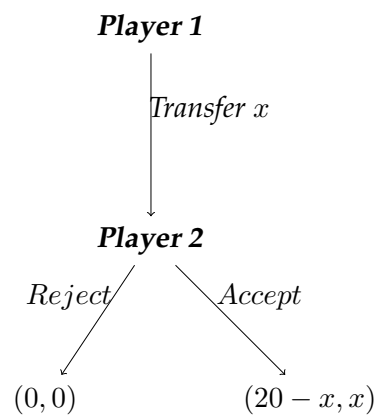


Figure 2: Decision tree: Ultimatum Game

The last game is the Ultimatum Game (UG) illustrated in Figure 2. An early description of the UG was given by Harsanyi in 1961. The game was experimentally investigated for the first time by Güth, Schmittberger, and Schwarze (1982). Player 1 in the role of proposer

is endowed with a positive amount of money (20 in our case) and may offer some of it ( $x$ ) to Player 2 (the responder) who accepts or rejects. If acceptance, the responder gets what has been offered and the proposer the rest. If rejection, both gets nothing. The strict Nash prediction is that the first player offers the smallest possible transferable value which the second player then accepts. Rejecting a positive offer is reflecting strong negative reciprocity. On the other hand, it is not evident how we should evaluate a positive offer. Is any positive offer a sign of pro-sociality or should it be close to the fair share (fifty-fifty)?

The motivation for including the UG in our study is to have a simple game for studying negative reciprocity. Falk et al. (2023) also use the UG to elicit negative reciprocity, but they rely on self-reported minimum acceptable offers by the responders and not real choices. Hence, the same criticism as we raised comparing the PD and the TG in terms of positive reciprocity (based on choices conditional on stated beliefs vs observables) would also apply for negative reciprocity as measured by Falk et al. We therefore use real choices.

By rejecting a positive (unacceptable) offer  $x$ , the responder punishes the proposer by denying him a payoff of  $20 - x$ . At the same time, rejection inflicts a cost on the responder equal to  $x$  (the payoff foregone). Hence, strong negative reciprocation (see Guala, 2012, for an extensive discussion of strong versus weak negative reciprocity).

Again, we may aggregate to get a measure of pro-sociality that might be more robust than the measure obtained from the PD. Moreover, we may compare the aggregate measure across the PD and the TG, and also

If you state that you believe the opponent will defect, you will not be a reciprocator but an altruist according to our definition. At an aggregate level, we may have a high proportion of strong positive reciprocators in one sample and a low proportion in another and use this as a measure of different levels of pro-sociality or social capital. Other combinations may also have interest. We could for example count defectors stating believing that the opponent will cooperate and use the aggregate as a measure of low social capital.

## 4 Design and Implementation

We conducted two experimental studies. One at LEE (Laboratorio de Economía Experimental) at Jaume I University (Castellón, Spain) and one at LEEN (Laboratoire d'Économie Expérimentale de Nice) at the University Côte d'Azur (Nice, France).

The experiments was pre-registered in early October 2022 (AsPredicted #108643, October 5th, 2022). In total, 4 sessions with 24 subjects each were run in both locations. First in Spain in October 2022 and then in France in November. Apart from the language, the exact same protocol, instructions, and incentives were used. The authors actively took part in running the experiments in both locations.

Subjects were recruited using ORSEE Greiner (2015) in both places. The subjects had given their explicit informed consent to being included in the local databases of LEE and LEEN prior to being called to the experiments. The recruitment processes were approved by the Ethical Committee of University Côte d'Azur and the Deontology Commission of

Jaume I University, respectively. Subject data were stored following the data protection recommendations of the European Commission (GDPR, 2016).

The experiments were computerized using the same standard z-Tree software Fischbacher (2007) in both locations (first coded in Spanish and then in French). Each session lasted about 1h30 and the average payment was 16€ (ranging from 2 to 33€).

Instructions to the subjects and a complete series of screenshots describing the experiment as seen on screen from the subject perspective are presented in the appendix. All subjects in a session were randomly seated in the laboratory. When seated, instructions were read aloud as well as available in print on a sheet of paper beside the computer. A computerised comprehension test was run and had to be correctly completed by all before continuing. The rest of the computerised session consisted of two parts: first an experimental part and then a survey part. We will now briefly describe the two parts.

Similar to Thöni et al. (2012), we take advantage of existing survey items externally validated through the World Values Survey (WVS). This makes it possible to compare the answers obtained from our two samples with publicly available data collected in connection with the latest wave of WVS (Wave 7). We may also compare our survey data to our experimental data. If agreement between the two types of measures, we may say that the survey items are validated in the SC context, or vice versa ?

The relevant WVS data are available both at the national level (Spain and France) and the regional level (Comunidad Valenciana and Provence-Alpes-Cote d'Azur). We used the same general binary question about trust as Thoni et al. (Q57): Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?

In our study we also used more specific questions from WVS related to groups. On a 4-point Likert scale from "trust completely" to "do no trust at all", subjects were asked to rate: family members (Q58), people you know (Q60), neighbors (Q59), people of another nationality (Q63), people of another religion (Q62), and people you meet for the first time (Q61). The relevance of adding the group measures is motivated by the distinction between personal relations (Q58-Q60) and relations with the strangers (Q61-Q63) discussed in the methodology section (Torche & Valenzuela, 2011) and our one-shot stranger-matching design in the experimental part (more below).

We also included questions from WVS related to memberships in organizations. As opposed to BSC that is measured by both survey items and experimental data, the only data we have on ASC is the answers to these WVS questions. Subjects were asked to indicate whether they were an active member, an inactive member, or not a member of 11 specific alternatives plus a residual category (other organizations). We decided to keep the exact same questions as in the WVS, despite the fact that for France and Spain the WVS has no information on these items. As of now, we have therefore not paid much attention to ASC as opposed to BSC, but we may return to the data we have collected for our samples in later versions, for example as controls in regressions on the individual level. More details on the survey part in general is available through the screenshots from the experiment in

the appendix.

The experimental part is, in addition to incentivised choices taken in the games described in Section 3 *Playing Games*, including incentivised stated beliefs related to the games, plus an incentivised cognitive test. In short, the experimental part includes all items that are incentivised, whereas the survey part includes all non-incentivised items (hypothetical questions from WVS and a short exit survey asking general background questions). The games as presented chronologically to the subjects are called Game 1, Game 2, and Game 3. But Game 1 may be PD for one subject and TG or UG for another, since order of play is randomized to allow testing for order effects since we have a between-subject design. On the same note, for the subjects the binary choices in PD and TG are not referred to as described in Section 3 but with more neutral labels. Cooperate, Trust and Honor Trust are all called A, and Defect and Abuse Trust are called B.

Let us briefly describe the cognitive test and the questions related to beliefs, before turning to choices in the experiments. The cognitive test we are using is the Cognitive Reflection Test (CRT). Note that in this study and in order to avoid floor effects due to relatively poor performance of students in the original three-items version of Frederick (2005), we use the seven-items CRT that has been developed by Toplak, West, and Stanovich (2014). The motivation for including the CRT is that previous studies have strongly suggested that cognitive abilities are associated with pro-social behaviour in the laboratory. Corgnet, Espín, Hernán-González, Kujal, and Rassenti (2016) show that CRT scores predicts trusting behavior, and Rand, Greene, and Nowak (2012) report increased cooperation in social dilemma after having forced individuals to decide under time pressure and hence to rely more on intuition than on deliberate thinking. For details on the specific CRT items used in our experimental part, please see Appendix.

We distinguish between private and social beliefs related to the games. By private we mean beliefs about the choices to be made by the other player in the two-player game in question. By social beliefs we mean beliefs about average play in the session.

Just as the order of games were randomized and order effects tested for, so were the roles as first position and second position player in the sequential games (the TG and the UG). But we also wanted to make sure that all players would play in both positions. Hence, the roles in the first sequential game being played were randomly assigned. In the second sequential game, the role assigned in the first was reversed. Hence, if you played in second position first, then you would play in first position in the second.

## 5 Results

Before we turn our attention to the results related to answers to the WVS items on BSC and game behaviour, let us pause for a moment and briefly comment on the content of Table 3 (Sample descriptives). We did briefly mention parochialism as a distinctive dimension separating the two samples. This is reflected in the number of subjects reporting to have lived all their life in the region (87 percent of subjects in Spain vs 55 percent in France). Cogni-

tive ability seems slightly higher on average in Spain with about 2.9 problems solved out of 7 vs 2.6 in France. We have also included the average of active memberships based on WVS items: about 1.2 memberships per person in Spain vs 1.7 in France. Both samples are almost perfectly balanced in terms of gender. Average age is 20.6 in Spain and slightly higher in France (22.2). Subjects in Spain has on average less prior experience as experimental subjects than the French subjects and their financial situation is self reported as better. The subjects with an economics related major is clearly higher in France.

These data give an idea about differences on average between the two samples for some variables that may a priori have some effect on SC differences. Foremost, some of them may have a role to play as control variables in regressions eliciting individual data relationships. For this version of the paper we have not prioritised individual data analysis, but we will return to this in later versions.

Table 3: Sample descriptives

	<b>Spain</b>	<b>France</b>
Parochialism: Lived all life in the region (%)	87	55
Cognitive ability (CRT 7): Avg. number of correct answers	2.865	2.604
Avg. number of active memberships	1.208	1.656
Female (%)	48	49
Age	20.6	22.2
Lab experience (1 = 1-3 times)	0.583	1.229
Economics related major (%)	24	56
Financial situation (0 = "well off", 1 = "reasonably good", 2 = "can hardly make ends meet")	0.823	1.240
N	96	96

Let us now turn to the survey part related to BSC. Results are reported in Table 4 (Aggregate answers survey questions). The general message reported in Table 4 is that on average all items show the same pattern across all 3 levels of spatial resolution from the national to the local level. Take the general trust item (Q57) as an example: 42 percent of 1210 respondents say they in general trust other people in Spain whereas in France it is 27 percent out of 1880. The corresponding numbers at the relevant regional level is 39 percent out of 129 respondents in CV and 28 percent out of 137 in PAC. At the lab in Spain (LEE) 30 percent out of 96 subjects and at the lab in France (LEEN) the number is 22 percent out of 96. For the group related trust items a number closer to 1 means higher trust and a quick look is sufficient to verify that numbers are indeed closer to 1 for Spain than for France across the board. Hence, same pattern as for the general trust question.

Next we turn to game behaviour, and start with choices and individual beliefs in the PD and for Trustors (first movers) in TG, presented in Table 5 (Two-sided and one-sided PD: Choices and beliefs). Recall that David Kreps likened the first position behaviour in his TG with the PD, referring to it as a one-sided PD. As for the pattern presented in Table 5, it is again completely consistent without exception across the board but in the opposite direction. Both choices (unconditional or conditional on pro-social or pro-self beliefs) and beliefs suggest that SC is higher in France than in Spain. In Table 5, A choice refers to pro-social play (cooperation in PD and trusting by the Trustor in the TG). A belief refers

Table 4: Aggregate answers survey questions

	Spain		France		Pooled
	LEE	WVS(7): ES/CV	LEEN	WVS(7): FR/PAC	LEE & LEEN
<b>Most people can be trusted – binary(Q57)</b>	<b>0.302</b>	<b>0.415/0.386</b>	<b>0.219</b>	<b>0.266/0.284</b>	<b>0.260</b>
<b>Groups (Likert scale 1-4: 1=trust completely) Averages</b>					
family(Q58)	1.135	1.152/1.085	1.531	1.377/1.401	1.333
neighborhood(Q59)	<b>2.635</b>	<b>2.014/2.155</b>	<b>2.177</b>	<b>2.071/2.139</b>	2.406
p-y-know in person(Q60)	1.521	1.626/1.767	2.250	1.736/1.730	1.885
<b>Close (personal)</b>	<b>1.764</b>	<b>1.597/1.669</b>	<b>1.986</b>	<b>1.728/1.757</b>	<b>1.875</b>
p-y-meet first time(Q61)	2.927	2.611/2.977	3.260	2.761/2.737	3.094
p-a-religion(Q62)	2.333	2.160/2.364	2.677	2.048/2.015	2.505
p-a-nationality(Q63)	2.219	2.136/2.341	2.667	2.148/2.036	2.443
<b>Distant (strangers)</b>	<b>2.493</b>	<b>2.302/2.561</b>	<b>2.868</b>	<b>2.319/2.263</b>	<b>2.681</b>
N	96	1210/129	96	1880/137	192

to individual pro-social beliefs (A play by the opponent in the PD or the Trustee in the TG). The labels A and B are the same as presented on screen to the subjects. Again, let us take an example. In the first row, for PD we have that 38 (out of 96) subjects choose A in Spain as opposed to 50 (out of 96) in France. By implication, a majority choose B (58) in Spain as reported in the second row, as opposed to France where a minority (46) choose B. From the third and fourth row we observe that a majority in both locations state believes that the opponent/Trustee will choose A, slightly higher in France (63) than in Spain (59). Out of the 59 with A beliefs in Spain, 32 choose A (about 54 percent). Out of the 63 with A beliefs in France, 42 choose A (about 67 percent). Hence, the proportion of strong positive reciprocators is higher in France than in Spain. We also observe that a non-negligible number in both locations choose A despite believing not to be reciprocated (6 in Spain and 8 in France), what we defined as altruists. In the lower part of Table 5, we find the corresponding data for the Trustor in the TG (TG 1st mover) and we observe the same pattern without exception as for the PD.

An interesting feature of the within-subject design in terms of the games being played, is elicitation of consistent pro-social play across games as alluded to earlier, with reference to Yamagishi et al. (2013). In Table 6, we observe that for France 17 out of the 48 subjects playing the role as Trustors in the TG, choose A in both the PD and TG. The number for Spain is only 10. Hence, more consistent pro-social play across games in France than in Spain. In Spain on the other hand, 22 choose B in both games as opposed to only 13 in France. Hence, more consistent pro-self play in Spain than in France.

So far we have not presented choices and beliefs for the Trustee (2nd mover in the TG). Observe that for Spain only 20 subjects out of the 48 were given the possibility to make a choice, being trusted by the Trustor. The number for France is 29. In Table 7 we present unconditional A choices in both PD and TG sorted by role as Trustor or Trustee in the TG. Concentrating on the Trustees (right side of the table), we observe that for PD about

Table 5: Two-sided and one-sided PD: Choices and beliefs

	Spain	France	Pooled
PD			
A choice	38 (0.396)	50 (0.521)	88 (0.458)
B choice	58 (0.604)	46 (0.479)	104 (0.542)
A belief	59 (0.615)	63 (0.656)	122 (0.635)
B belief	37 (0.385)	33 (0.344)	70 (0.365)
N	96	96	192
A choice conditional on A belief	32 (32/59=0.542)	42 (42/63=0.667)	74 (74/122=0.607)
A choice conditional on B belief	6 (6/37=0.162)	8 (8/33=0.242)	14 (14/70=0.200)
TG 1 <sup>st</sup> mover			
A choice	20 (0.417)	29 (0.604)	49 (0.510)
B choice	28 (0.583)	19 (0.396)	47 (0.490)
A belief	25	32	57
B belief	23	16	39
N	48	48	96
A choice conditional on A belief	15 (15/25=0.600)	23 (23/32=0.719)	38 (38/57=0.667)
A choice conditional on B belief	5 (5/23=0.217)	6 (6/16=0.375)	11 (11/39=0.282)

Note: Frequencies (proportions in parentheses).

Table 6: Two-sided and one-sided PD: Consistent pro-social play

	Spain	France	Pooled
AA	10	17	27
BB	22	13	35
AB	6	6	12
BA	10	12	22
N	48	48	96

Note: First letter is the choice in PD and second letter is the choice in TG

46 percent choose A in Spain as opposed to 56 percent in France (first row). For TG, 55 percent choose A in Spain as opposed to 69 percent in France. In short, the same pattern as seen in Table 5.

In Table 8, we also present A choices conditional on A beliefs (strong positive reciprocation) sorted by role in the TG. The most interesting in Table 8 is the within-subject comparisons for the Trustees on the right side of the table. The first row gives the number of strong reciprocators in the PD based on beliefs. The second row gives the number of reciprocators in the TG based on observables. As argued by Clark and Sefton (2001), decisions based on observables is a stronger exhibit of evidence for reciprocation than declared beliefs. Table 8 suggests that despite this, the proportion of reciprocators in either case seems remarkable similar. In particular for France (about 70 percent in either case). For Spain, the percentage is slightly lower when decision is based on observables (55 percent) than based on beliefs (about 66 percent).

We round off this result section, by presenting some results pertaining to statistical testing in Table 9. For the survey items in our samples the data suggests that SC is consistently higher in Spain than in France. Indeed, using ordinary chi(2) tests, we reject the null hy-

Table 7: Pro-social play in PD and TG by role in TG

	1 <sup>st</sup> mover TG			2 <sup>nd</sup> mover TG		
	Spain	France	Pooled	Spain	France	Pooled
PD A choices	16 (16/48=0.333)	23 (23/48=0.479)	39 (39/96=0.406)	22 (22/48=0.458)	27 (27/48=0.563)	49 (49/96=0.510)
TG A choices	20 (20/48=0.417)	29 (29/48=0.604)	49 (49/96=0.510)	11 (11/20=0.550)	20 (20/29=0.690)	31 (31/49=0.633)

Note: The PD players are sorted according to role in the TG. Hence, the same subjects are compared vertically (within-subject) and different subjects horizontally (between-subjects). Observe that 2<sup>nd</sup> movers TG only choose A or B if they are trusted (1<sup>st</sup> mover play A).

Table 8: Strong positive reciprocators: beliefs vs choices

	1 <sup>st</sup> mover TG			2 <sup>nd</sup> mover TG		
	Spain	France	Pooled	Spain	France	Pooled
PD A choices conditional on A beliefs	13 (13/30=0.433)	19 (19/30=0.633)	32 (32/60=0.533)	19 (19/29=0.656)	23 (23/33=0.697)	42 (42/62=0.677)
TG A choices conditional on A beliefs by 1 <sup>st</sup> movers	15 (15/25=0.600)	23 (23/32=0.719)	38 (38/57=0.667)	11 (11/20=0.550)	20 (20/29=0.690)	31 (31/49=0.633)

Note: The PD players are sorted according to role in the TG. Hence, the same subjects are compared vertically (within-subject) and different subjects horizontally (between-subjects). Observe that 2<sup>nd</sup> movers TG only choose A or B if they are trusted (1<sup>st</sup> mover play A).

pothesis that SC is the same in Spain and France in favor of the alternative hypothesis that it is higher in Spain than in France for the group based items Q58-Q63. For the general trust item Q57, we cannot reject the null at conventional significance levels. A one sided test would give rejection, but only at the 10 percent level. The difference between the test results for the general item and the more specific group items may reflect that the general item could be perceived as more imprecise by the subjects and interpreted in different ways leading to a more poorly identified estimate than for the group measures (see also the discussion in Glaeser et al. (2000)).

The experimental data on the other hand suggest that SC is higher in France than in Spain. For the experimental data, we safeguard against possible dependence between individual observations by using group averages for the groups involving multiple (anonymous) interactions between participants. Recall that we have a stranger-matching design, but not a perfect stranger-matching design. This leads to a much lower number of observations. Using two-sided proportion tests for pro-social play, we reject the null of equal proportions in Spain and France in favour of the alternative that it is higher in France across PD and TG regardless of role.



Table 9: Is SC statistically different between Spain and France?

	Spain	France	<i>p</i> -value	N Spain	N France
WVS national/regional				1210/129	1880/13
Q57	More	Less			
Q58	More	Less			
Q59	More	Less			
Q60	More	Less			
Q61	More	Less			
Q62	More	Less			
Q63	More	Less			
Our sample survey items (chi2-tests)					
				96	96
Q57	More	Less	0.188		
Q58	More	Less	0.000		
Q59	More	Less	0.000		
Q60	More	Less	0.000		
Q61	More	Less	0.000		
Q62	More	Less	0.005		
Q63	More	Less	0.000		
Our experiments (two-sided proportion tests)					
PD A	Less	More	0.385	24	24
TG Trustor A	Less	More	0.194	24	24
TG Trustee A	Less	More	0.432	20	15

## 6 Concluding remarks

In this paper, we have explored to what extent inexpensive survey data can be a substitute for more expensive experimental data as a metric of Social Capital (SC), using a cross-country design. We use data from two standard subject pools (located in Spain and France) and a mixed-method approach in the sense of presenting validated survey questions from the SC section of the latest wave of World Values Survey (WVS) to our participants, in addition to games for eliciting SC through preferences and beliefs. Our data can be compared to existing WVS data at the relevant regional level as well as the national level. The main takeaway from our study is that SC measured by survey items consistently is higher in Spain than in France regardless of item and spatial resolution (nation, region, lab), whereas SC measured by choices and beliefs in incentivised games consistently is higher in France. This may confirm that there is reason for scepticism concerning the validity of survey measures in the context of social capital, not least since we, as opposed to in earlier studies, have data on group specific items used in the latest wave of WVS pertaining to trust in personal relations as well as more distant relations, all consistently pointing in the same direction regardless of spatial resolution. In this version of the paper we have been concentrating on aggregates. Work remain to be done on the individual level. We will return to this in later versions of the paper.

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## A Instructions

### GENERAL

Thank you for accepting to participate in this experiment and welcome to Laboratorio de Economía Experimental (LEE). We are carrying out a research project on decision making. If you carefully follow the instructions and make good decisions, you can earn a considerable amount of money. Your data will be confidentially treated, and they will not be used for any purpose alien to this project. Your name will never be associated to your decisions when the results are published. Communication with other participants in the session are strictly forbidden and will lead to immediate experiment termination for those participants breaching the rule. We also ask you to turn off your mobile phones and not use them for the duration of the experience. If you encounter a technical problem, all we ask is that you raise your hand silently and wait for the experimenter to come to you. Everyone in this room has access to the same instructions and will participate in the same experiment. Finally, this experiment should last no longer than an hour and a half.

The session consists of an experimental part and a survey part. At the beginning of the experimental part, you will be asked to answer a comprehension test about the instructions on your computer. After the test, you will be randomly matched with a participant with whom you will interact during the first period. At the beginning of the second and the third period you will be randomly rematched with a participant. You will never discover the identity of the participants you are matched with, as they will also never discover yours. The experimental part consists of a sequence of 3 games and is ended by some questions that you are asked to answer. At the end of the experimental part a volunteer will throw a dice to determine which of the 3 periods will be considered for the payment to all participants. Your answers to the questions after the games will also be considered for your payment. In the survey part you will be asked some standard questions commonly used in international surveys. At the end of the session, you will be asked to provide some background information by filling out a short questionnaire. On leaving the session, your earnings will be personally communicated to you and paid in cash.

### THE EXPERIMENTAL PART

The experimental part consists of a sequence of three games plus some questions that you are asked to answer. The order of the games in the sequence will be determined randomly by the computer for each participant. A summary of instructions for each game is given below. More specific instructions are presented on screen as we move along.

Before each game you will be asked about your expectations regarding the behaviour of the other participants in the game. You will earn a maximum of 1€ for each answer depending on how close it is to the real outcome.

**GAME 1** You are randomly matched with a participant and the two of you are randomly assigned the role of Player 1 or Player 2. Player 1 will decide first and Player 2 will decide second, knowing what Player 1 has decided. You have to decide whether you

choose option A or B. If you are Player 1, you make your decision based on the information on payments provided in a Table like the one below:

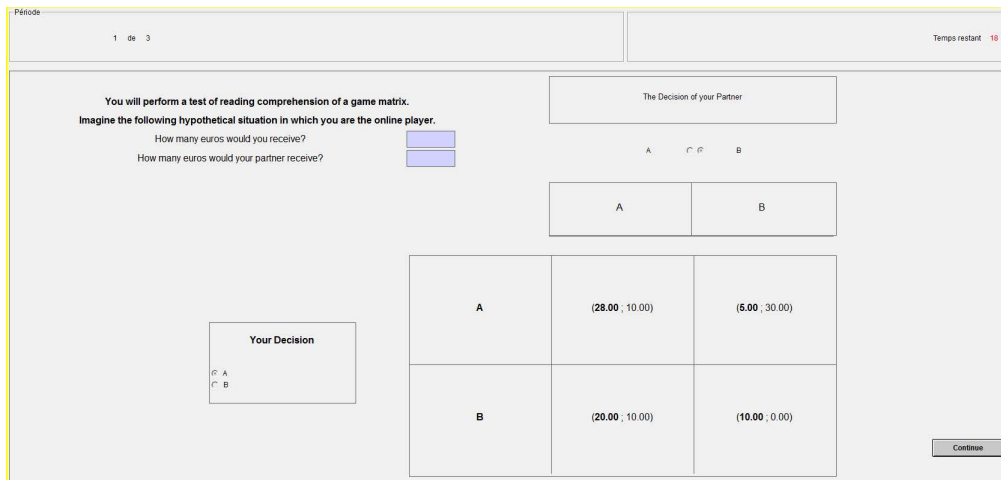


Figure 3: Screenshot of the Comprehension Test

If you are Player 2, you also choose between option A or B but now, you will be presented with a rearranged matrix (from the vantage point of Player 2) as below and you will know what Player 1 has chosen.

## GAME 2

You are randomly assigned the role of Player 1 or Player 2. If you are Player 1 you have to decide how much out of 20€ you are willing to offer to Player 2. Player 2 can either accept or reject your offer. If Player 2 accepts, you will keep the difference between the 20€ and the amount you offered to Player 2. If Player 2 rejects the offer then both Player 1 and Player 2 get zero.

## GAME 3

Player 1 and Player 2 make their decision at the same time based on the information about the payments given in the table below:

You will be shown a screen with the summary of your decisions and outcomes in each period and in the questions task from the experimental immediately after completing the questions task. Then a volunteer will randomly determine the paid period for every participant.

## B Screenshots

Période 1 de 3 Temps restant 18

You will perform a test of reading comprehension of a game matrix.  
Imagine the following hypothetical situation in which you are the online player.

How many euros would you receive?

How many euros would your partner receive?

Your Decision

A

B

The Decision of your Partner

A  B

	A	B
A	(28.00 ; 10.00)	(5.00 ; 30.00)
B	(20.00 ; 10.00)	(10.00 ; 0.00)

Figure 4: Screenshot: Comprehension test

Période 1 de 3 Temps restant 49

You will now play Game 1. You have been randomly assigned the role of 1b Player 1 in this game. ? ? ? ? ? ?  
Please refer to the instructions to understand what are the possible choices of each player.

We would like to ask you a few questions before we continue the experiment. You will earn up to 3€ in this task depending on how accurate your predictions are. For each period, you will receive 1€ if you answer the first question correctly and 1€ minus the absolute value of the difference between your estimated percentage and the actual percentage for the second and third questions. For example, if your prediction for the second question is 50%, you will receive 1€ - 0.5€ = 0.5€ for that question. ? ? ? ? ? ?

Do you think your partner will choose A or B in this period?  I think A is more likely  I think B is more likely

According to you, what is the percentage of type 1 players in this room who have played A in this period? ? ? ? ? ? ?  
(Please enter an INTEGER comprised between 0 and 100)

According to you, what is the percentage of type 2 players in this room who have played A in this period? ? ? ? ? ? ?  
(please enter an INTEGER comprised between 0 and 100)

Figure 5: Screenshot: Trust Game - Player 1's beliefs

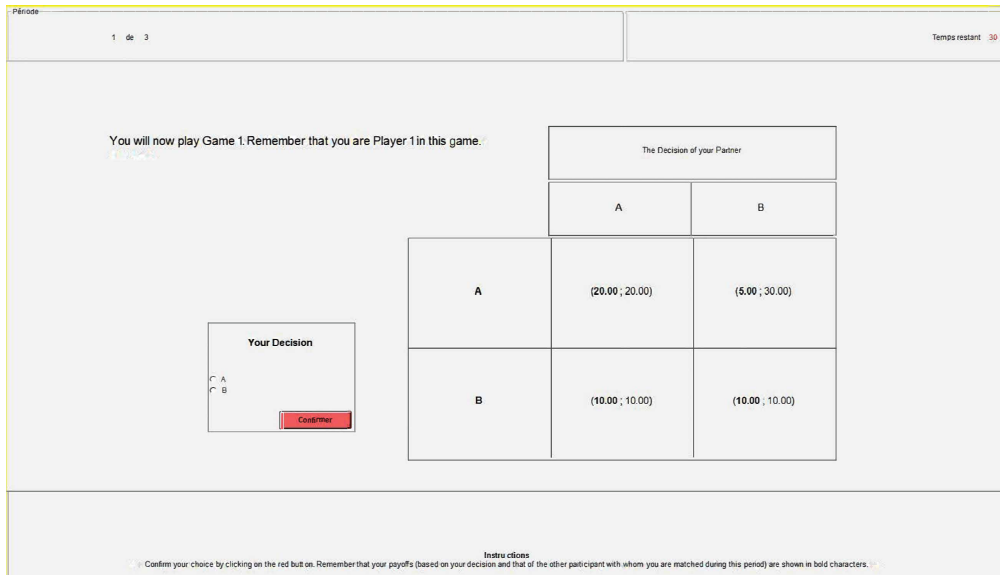


Figure 6: Screenshot: Trust Game - Player 1's choice

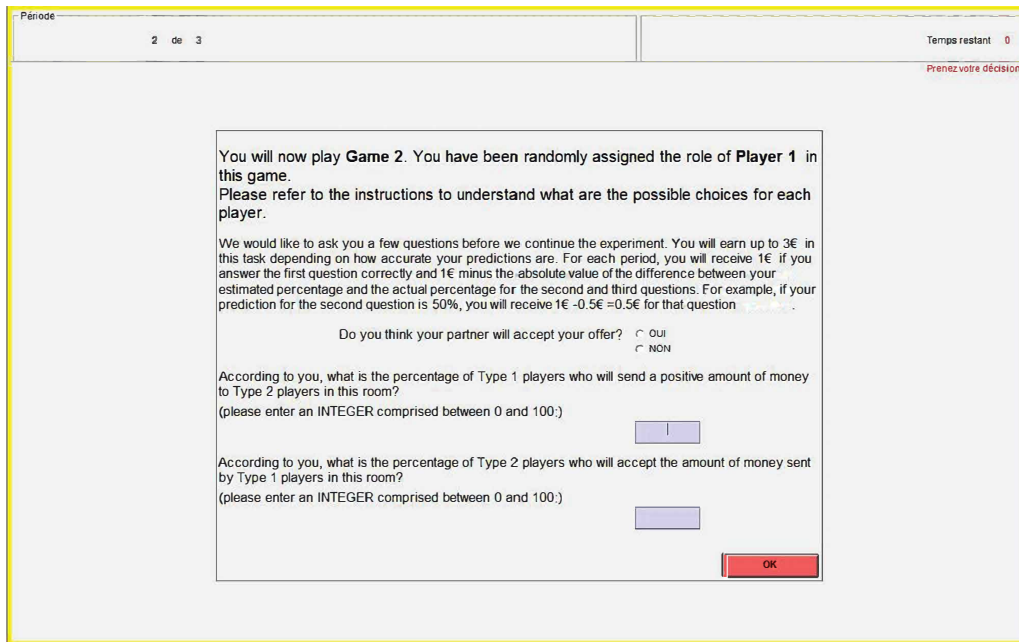


Figure 7: Screenshot: Ultimatum Game - Player 1's beliefs

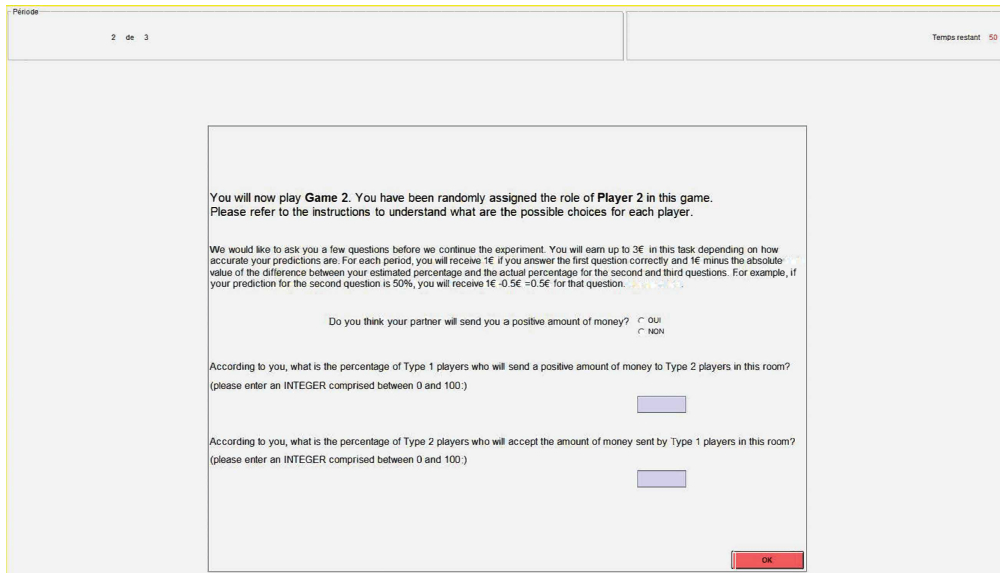


Figure 8: Screenshot: Ultimatum Game - Player 2's beliefs

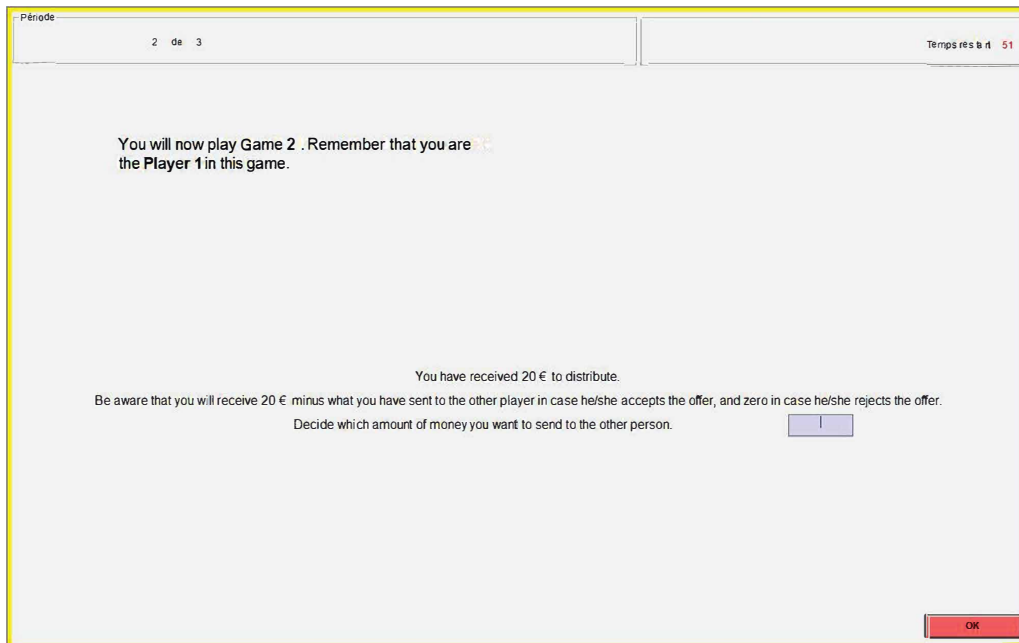


Figure 9: Screenshot: Ultimatum Game - Player 1's decision



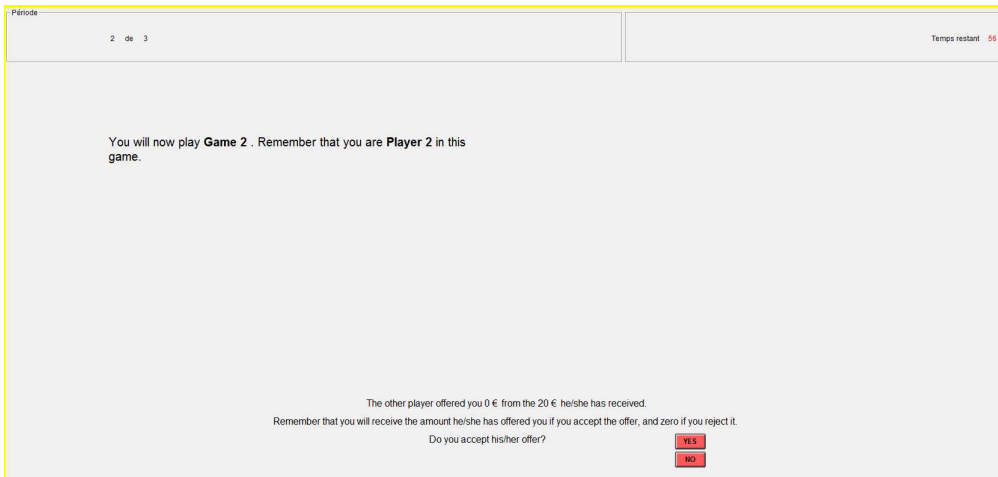


Figure 10: Screenshot: Ultimatum Game - Player 2's decision

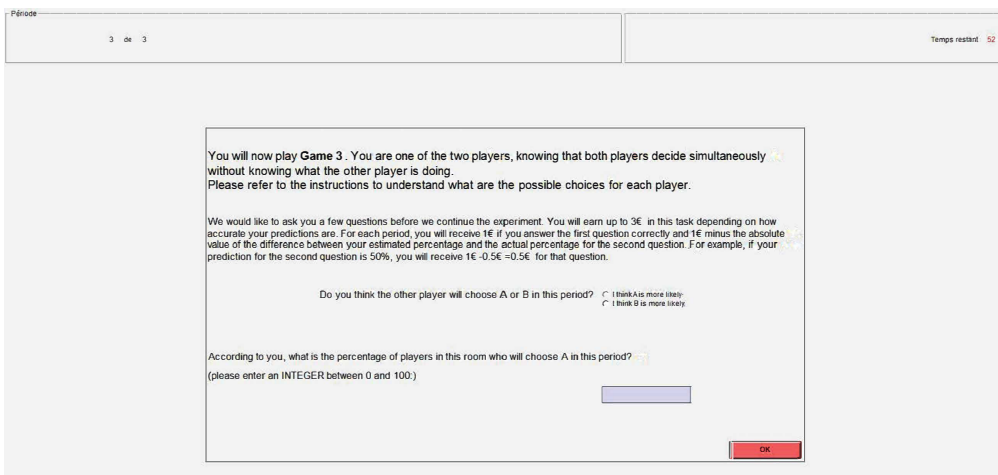


Figure 11: Screenshot: Prisoner's Dilemma - Beliefs

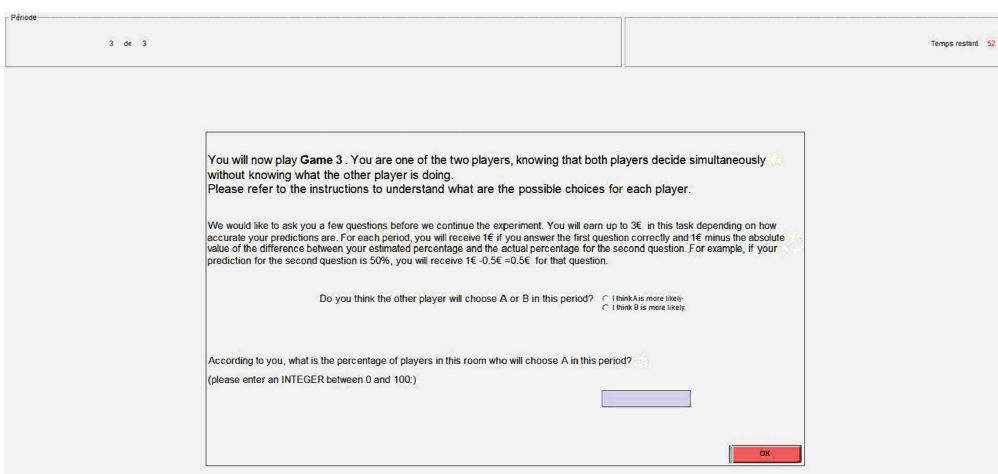


Figure 12: Screenshot: Prisoner's Dilemma - Choice

Période 3 de 3 Temps restant 21

Your final win in Euros during this session will be calculated after a roll of the dice by a volunteer to determine the PERIOD to be considered.  
Your cumulated payoffs for the period which has been selected by the dice and for the 7 questions are summarized in the table below.

**N'APPUYEZ PAS SUR CE BOUTON TANT QUE LE DÉ N'A PAS ÉTÉ LANCÉ ET QUE VOUS N'AVEZ PAS PU VÉRIFIER LE CALCUL DE VOS GAINS.**

Game played	Period	My Decision in G1	The Decision of my Partner in G1	My gains in the game	Prediction of my Partner in the Game	Prediction 2: Percentage of A among Type 1 Players	Effective % of Prediction 2	Prediction 3: Percentage of A among Type 2 Players	Effective % of Prediction 3	Gains for Prediction 1	Gains for Prediction 2	Gains for Prediction 3	Cumulated gains in the Period
1	1	A	B	5.00	A	2	200	2	-nan(ind)	0.0	-0.880	nan	-nan(ind)
Game played	Period	The Offer of my Partner in G2	My Decision in G2	My Gains in the game	Prediction of an Offer of a positive amount from your Partner	Prediction 2: Percentage of positive Offers	Effective % of Prediction 2	Prediction 3: Percentage of accepted Offers among Type 2 Players	Effective % of Prediction 3	Gains for Prediction 1	Gains for Prediction 2	Gains for Prediction 3	Cumulated gains in the Period
2	2	0	Accepter	0.00	Si	0	0	0	200	0.0	1.000	-1.000	0.0
Game played	Period	My Decision in G3	The Decision of my Partner in G3	My Gains in the Game	Prediction of my Partner in the game	Prediction 2: Percentage of A	Effective % of Prediction 2	Gains for Prediction 1	Gains for Prediction 2	Cumulated gains in the Period			
3	3	B	B	10.00	A	25	0	0.0	0.740	10.9			
7-questions quiz				Number of saved answers	Number of correct answers	Gains in the task							
				3	0	0.0							

Figure 13: Screenshot: Synthesis of decisions

Période 3 de 3 Temps restant 09

You will now answer 7 questions in succession. You have a maximum of 2 minutes to answer each question.  
You will earn 0,5€ for each correct answer. Wrong answers and non-response are not penalized.

Question 1 : A bat and a ball cost 1,10€ in total. The bat costs a euro more than the ball. How much does the ball cost in cents?

**Note Bene: don't forget to click on this button to save your answer and move on to the next question.**

Figure 14: Screenshot: CRT Q1

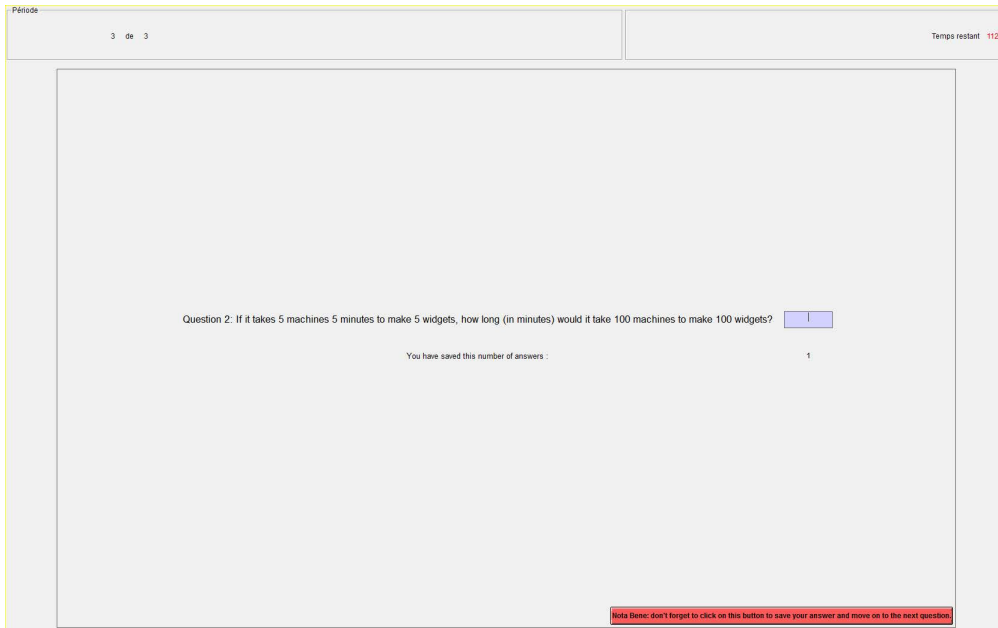


Figure 15: Screenshot: CRT Q2

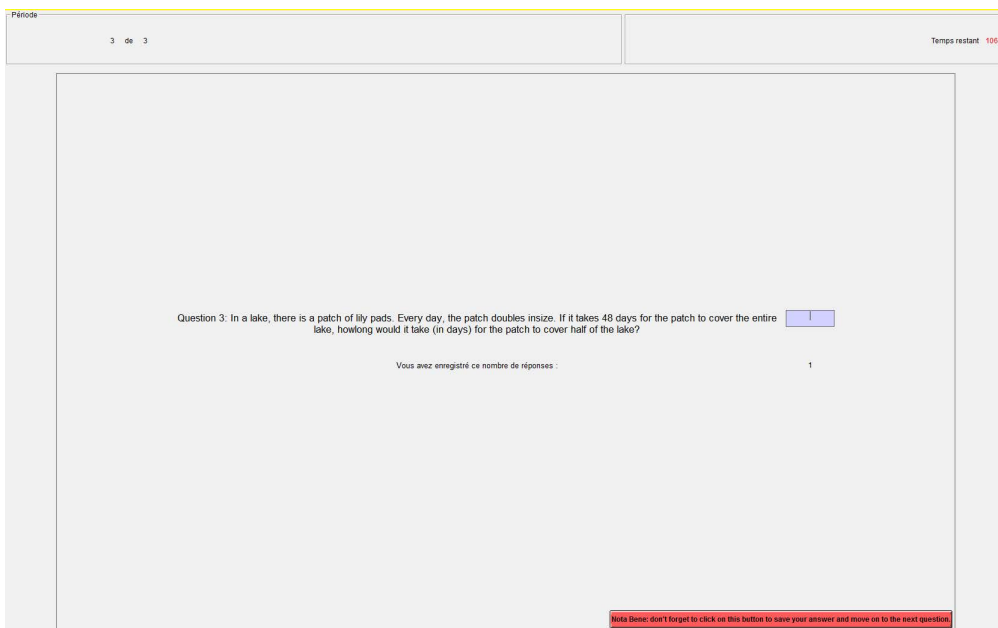


Figure 16: Screenshot: CRT Q3

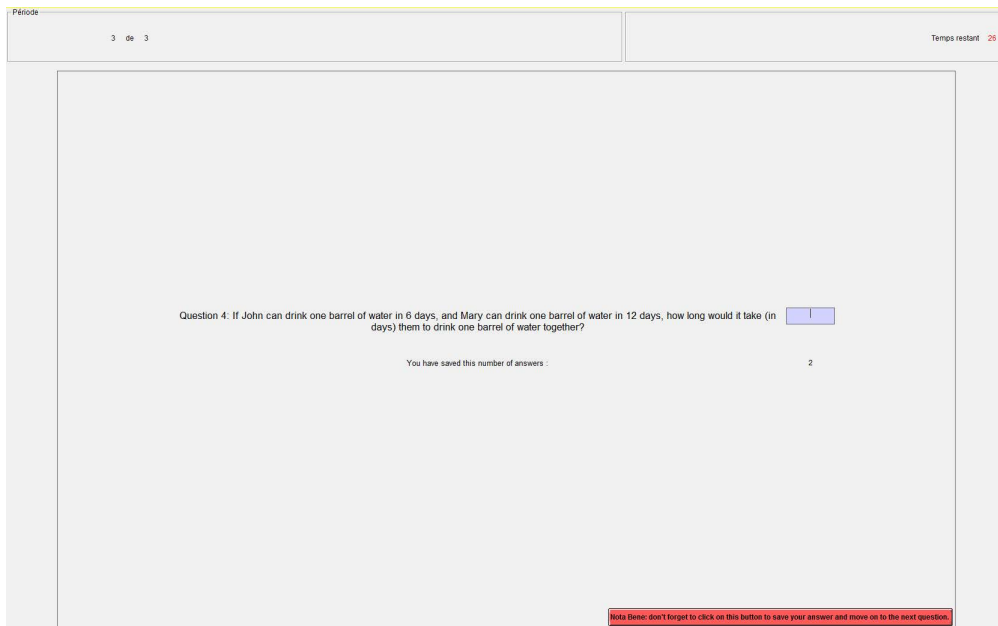


Figure 17: Screenshot: CRT Q4

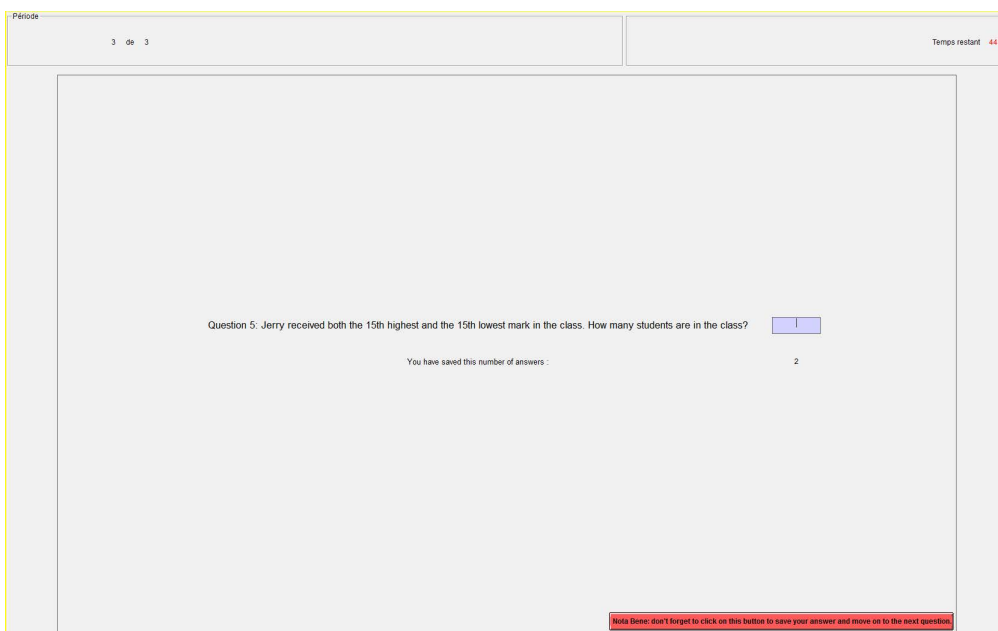


Figure 18: Screenshot: CRT Q5

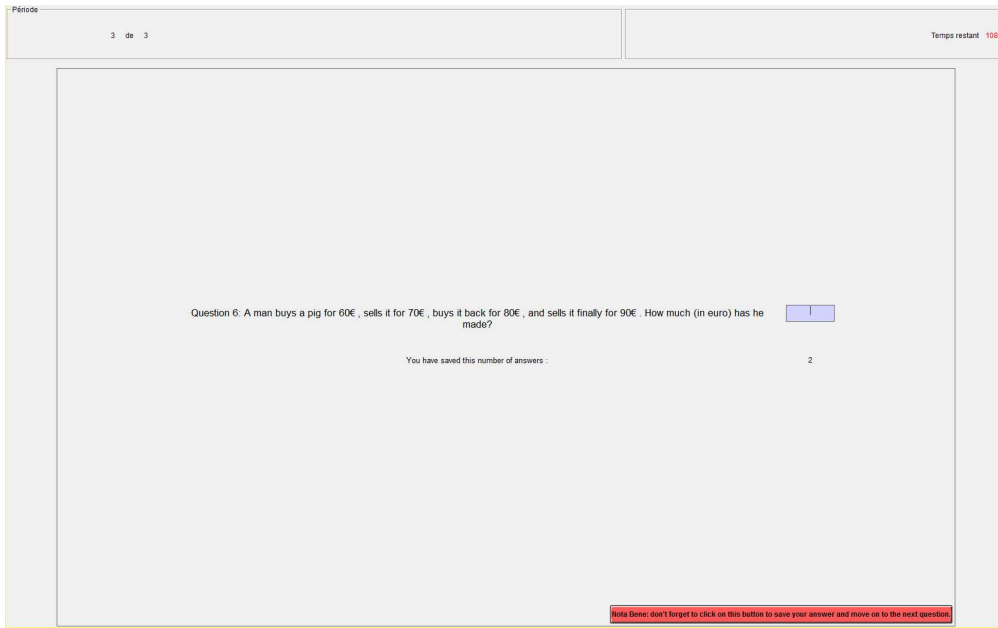


Figure 19: Screenshot: CRT Q6

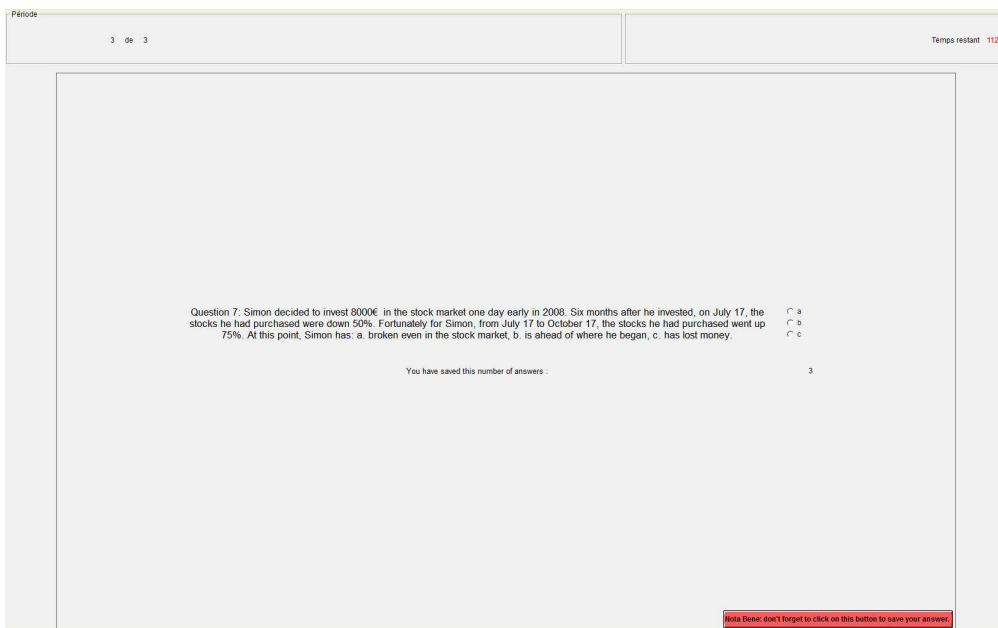


Figure 20: Screenshot: CRT Q7

Période 3 de 3 Temps restant 50

Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?  Most people can be trusted  
 Need to be very careful

I'd like to ask you how much you trust people from various groups. Could you tell me for each whether you trust people from this group completely, somewhat, not very much or not at all?

Your family	<input type="radio"/> Trust completely <input type="radio"/> Trust somewhat <input type="radio"/> Do not trust very much <input type="radio"/> Do not trust at all
Your neighborhood	<input type="radio"/> Trust completely <input type="radio"/> Trust somewhat <input type="radio"/> Do not trust very much <input type="radio"/> Do not trust at all
People you know personally	<input type="radio"/> Trust completely <input type="radio"/> Trust somewhat <input type="radio"/> Do not trust very much <input type="radio"/> Do not trust at all
People you meet for the first time	<input type="radio"/> Trust completely <input type="radio"/> Trust somewhat <input type="radio"/> Do not trust very much <input type="radio"/> Do not trust at all
People of another religion	<input type="radio"/> Trust completely <input type="radio"/> Trust somewhat <input type="radio"/> Do not trust very much <input type="radio"/> Do not trust at all
People of another nationality	<input type="radio"/> Trust completely <input type="radio"/> Trust somewhat <input type="radio"/> Do not trust very much <input type="radio"/> Do not trust at all

OK

Figure 21: Screenshot: WVS Q57-Q63

Période 3 de 3 Temps restant 54

Now I am going to read off a list of voluntary organizations. For each organization, could you tell me whether you are an active member, an inactive member or not a member of that type of organization?

Church or religious organization	<input type="radio"/> Active member <input type="radio"/> Inactive member <input type="radio"/> Don't belong	Sport or recreational organization, football/baseball/rugby team	<input type="radio"/> Active member <input type="radio"/> Inactive member <input type="radio"/> Don't belong
Art, music or educational organization	<input type="radio"/> Active member <input type="radio"/> Inactive member <input type="radio"/> Don't belong	Labor Union	<input type="radio"/> Active member <input type="radio"/> Inactive member <input type="radio"/> Don't belong
Political party	<input type="radio"/> Active member <input type="radio"/> Inactive member <input type="radio"/> Don't belong	Environmental organization	<input type="radio"/> Active member <input type="radio"/> Inactive member <input type="radio"/> Don't belong
Professional association	<input type="radio"/> Active member <input type="radio"/> Inactive member <input type="radio"/> Don't belong	Humanitarian or charitable organization	<input type="radio"/> Active member <input type="radio"/> Inactive member <input type="radio"/> Don't belong
Consumer organization	<input type="radio"/> Active member <input type="radio"/> Inactive member <input type="radio"/> Don't belong	Self-help group, mutual aid group	<input type="radio"/> Active member <input type="radio"/> Inactive member <input type="radio"/> Don't belong
Women's group	<input type="radio"/> Active member <input type="radio"/> Inactive member <input type="radio"/> Don't belong	Other organization	<input type="radio"/> Active member <input type="radio"/> Inactive member <input type="radio"/> Don't belong

OK

Figure 22: Screenshot: WVS Q94-Q105

Périsse 3 de 3 Temps restant 52

Sex  Male  
 Female

Age

Education  Economics/Management  
 Law/Political Science  
 Mathematics/Statistics/Natural Sciences  
 Computer Science  
 Psychology  
 Physiology/Sport  
 Medicine  
 History/Geography  
 Language/Literature  
 Other

If your major field is not mentioned in the list, please specify

How many times in the past have you participated in similar experimental sessions?  
 It is the first time  
 Between 1 and 3 times  
 Between 4 and 6 times  
 Between 6 and 9 times  
 More than 9 times

For how long have you been living in the Provence Alpes Côte d'Azur area??

How would you rate your family's current financial situation? Would you say it is:  
 comfortable  
 acceptable  
 tight  
 difficult

OK

Figure 23: Screenshot: Demographic Questionnaire

## C World Values Survey Questions

**Q57. Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people? (Code one answer):**

- 1 Most people can be trusted
- 2 Need to be very careful

**I'd like to ask you how much you trust people from various groups. Could you tell me for each whether you trust people from this group completely, somewhat, not very much or not at all? (Read out and code one answer for each):**

	Trust completely	Trust somewhat	Do not trust very much	Do not trust at all
Q58 Your family	1	2	3	4
Q59 Your neighborhood	1	2	3	4
Q60 People you know personally	1	2	3	4
Q61 People you meet for the first time	1	2	3	4
Q62 People of another religion	1	2	3	4
Q63 People of another nationality	1	2	3	4

Figure 24: WVS Wave 7: Q57-Q62

Now I am going to read off a list of voluntary organizations. For each organization, could you tell me whether you are an active member, an inactive member or not a member of that type of organization? (Read out and code one answer for each organization):

		Active member	Inactive member	Don't belong
Q94	Church or religious organization	2	1	0
Q95	Sport or recreational organization, football/baseball/rugby team	2	1	0
Q96	Art, music or educational organization	2	1	0
Q97	Labor Union	2	1	0
Q98	Political party	2	1	0
Q99	Environmental organization	2	1	0
Q100	Professional association	2	1	0
Q101	Humanitarian or charitable organization	2	1	0
Q102	Consumer organization	2	1	0
Q103	Self-help group, mutual aid group	2	1	0
Q104	Women's group	2	1	0
Q105	Other organization	2	1	0

Figure 25: WVS Wave 7: Q94-Q105

## D 7-items CRT

The questions task consists in a 7-items Cognitive Reflection Test.

The first 3 questions are original three items of Frederick (2005): (1) A bat and a ball cost 1.10€ in total. The bat costs a dollar more than the ball. How much (in cents) does the ball cost (in cents)? [Correct answer: 5; intuitive answer: 10] (2) If it takes 5 machines 5 minutes to make 5 widgets, how long (in minutes) would it take 100 machines to make 100 widgets? [Correct answer: 5; intuitive answer: 100] (3) In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long (in days) would it take for the patch to cover half of the lake? [Correct answer: 47; intuitive answer: 24] The following four-items are identical to Toplak

et al. (2014) but for the currency unit: (4) If John can drink one barrel of water in 6 days, and Mary can drink one barrel of water in 12 days, how long (in days) would it take them to drink one barrel of water together? [correct answer: 4; intuitive answer: 9] (5) Jerry received both the 15th highest and the 15th lowest mark in the class. How many students are in the class? [correct answer: 29; intuitive answer: 30] (6) A man buys a pig for 60€, sells it for 70€, buys it back for 80€, and sells it finally for 90€. How much (in euros) has he made? [correct answer: 20; intuitive answer: 10] (7) Simon decided to invest 8000€ in the stock market one day early in 2008. Six months after he invested, on July 17, the stocks he had purchased were down 50%. Fortunately for Simon, from July 17 to October 17, the stocks he had purchased went up 75%. At this point, Simon has: a. broken even in the stock market, b. is ahead of where he began, c. has lost money [correct answer: c, because the value at this point is 7000€; intuitive response: b].

## E The survey part

The WVS Questions of the second part of the are taken from the WVS 2017-2018 Wave 7 Section on SOCIAL CAPITAL, TRUST & ORGANIZATIONAL MEMBERSHIP



The first list of questions (Q57-Q63) relate to trust in general and trust conditional on social distance.

**Q57. Generally speaking, would you say that most people can be trusted or that you need to be very careful dealing with people? (Code one answer):**

- 1 Most people can be trusted
- 2 Need to be very careful

**I'd like to ask you how much you trust people from various groups. Could you tell me for each whether you trust people from this group completely, somewhat, not very much or not at all? (Read out and code one answer for each group):**

		Trust completely	Trust somewhat	Do not trust very much	Do not trust at all
Q58	Your family	1	2	3	4
Q59	Your neighborhood	1	2	3	4
Q60	People you know personally	1	2	3	4
Q61	People you meet for the first time	1	2	3	4
Q62	People of another religion	1	2	3	4
Q63	People of another nationality	1	2	3	4

Figure 26: WVS Wave 7: Q57-Q62

The second list of questions

**Now I am going to read off a list of voluntary organizations. For each organization, could you tell me whether you are an active member, an inactive member or not a member of that type of organization? (Read out and code one answer for each organization):**

		Active member	Inactive member	Don't know
Q94	Church or religious organization	2	1	3
Q95	Sport or recreational organization, football/baseball/rugby team	2	1	3
Q96	Art, music or educational organization	2	1	3
Q97	Labor Union	2	1	3
Q98	Political party	2	1	3
Q99	Environmental organization	2	1	3
Q100	Professional association	2	1	3
Q101	Humanitarian or charitable organization	2	1	3
Q102	Consumer organization	2	1	3
Q103	Self-help group, mutual aid group	2	1	3
Q104	Women's group	2	1	3
Q105	Other organization	2	1	3

Figure 27: WVS Wave 7: Q94-Q105