Social and Moral Norms in Allocation Choices in the Laboratory

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Abstract: Social norms involve observation by others and external sanctions for violations, while moral norms involve introspection and internal sanctions. To study such norms and their effects, we design a laboratory experiment. We examine dictator choices, where we create a shared understanding by providing advice from peers with no financial payoff at stake. We vary whether advice is given, as well as whether choices are made public. This design allows us to explicitly separate the effects of moral and social norms. We find that choices are in fact affected by a combination of observability and the shared understanding.

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1. Introduction

Economic theory typically presumes that people know their own preferences and make decisions on the basis of these preferences. Yet in many situations people rely on norms to guide their behavior, so that one's utility appears to depend on the degree of one's adherence to the perceived norms. In this study, we develop and apply a tool to distinguish between different types of norms. We consider an allocation decision (featuring six possible alternative choices) to be made amongst three people, after advice from other people who have no financial payoff at stake. We also vary whether the chosen action (but not the advice given) is observable to the other people in the experiment.

Elster (2009) offers a categorization of types of norms that makes explicit the importance of sociality. He defines a social norm to be a "non-outcome-oriented injunction to act or to abstain from acting, sustained by the sanctions that others apply to norm violators." Sanctions need not be monetary, but could instead involve shame. Thus, *observation* is a critical element of social norms. Social norms are powerful due to the common desire for approval from one's peers or colleagues, and observation brings this issue to the fore. One's identity (see Akerlof and Kranton, 2000) is shaped in part by this desire, and one acts in accord with the social norm in order to be a respected group member.[1]

Elster distinguished between such social norms and moral norms. In his view the latter have been internalized, so that 'punishment' comes from within and is manifested by a negative view of one's self, perhaps involving emotions such as guilt or remorse.[2] Moral norms require introspection rather than external observation. Both require a shared understanding about what

[1] See Charness, Rigotti, and Rustichini (2007) and Andreoni and Bernheim (2009) for some experimental evidence concerning the effect of observation.
[2] Note that 'internalized social norms' may be seen as a special case of moral norms.

one ought to do. While moral norms involve a decision maker internalizing this shared understanding through an emotional mechanism like guilt, social norms involve an emotional mechanism (like shame) that induces a decision maker to adhere to the shared understanding when others observe her decision. Traditionally, much focus has been on social norms. Note however, that an increasing number of decisions are being made behind a computer screen. This means that decisions are increasingly often being made privately, hence moral norms are becoming more important. Elster's definition of social and moral norms provides a useful and intuitive distinction that allows one to isolate the two characteristics of norms that are arguably most salient. On the one hand, this is the prescription of what one 'ought to do'. On the other, it is the shared belief with others about what this prescription is. The distinction Elster makes is central to our analysis and experimental design.[3]

Elster's definitions focus directly on the role that norms play in the individual decision-making process. Others have attempted to define norms based on the strategic interaction between individuals and to derive norms indirectly from observed behavior (see Reuben and Riedl 2011 for a discussion).[4] The advantage of Elster's definition over these is that it focuses directly on individual decision rules, without any need for assumptions about the strategic interaction between individuals.

In this regard, a major contribution of our study is that we use a simple design that allows us to focus directly on such decision rules. Not only does it allow us to measure the norm that is

[3] Note that we are not claiming that the distinction between moral and social norms is clearly black-and-white. Social norms are likely to have a moral basis, while moral norms often have a social or practical underpinning. Nevertheless, there is a real difference in the flavor of these norms.

[4] For example, Young (2008) sees norms (which he calls 'conventions') as the equilibria of an underlying game and applies the term only to games with multiple equilibria; norms cannot enforce non-equilibrium behavior (other authors that see norms as equilibria to games include Binmore and Samuelson 1994, Gintis 2009, and Ellingson et al. 2011). On the other hand, Bicchieri (2006) sees conventions as a coordination device, followed out of individual self-interest. Like Elster (2009), Bicchieri contrasts conventions with social norms, which in her view enforce out-of-equilibrium behavior in situations where individual optimization is inefficient.

applicable in a specific situation, it is also informative of the specific behavior that the norm prescribes. One may think of decision rules as expressions of the prescriptions that arise from the norm. Studying the decision rules directly measures the imperative associated with the norm. As an example, while Krupka and Weber (2010) use a technique to try to identify which action is most appropriate, they are not able to explain how this is translated into a decision rule.[5]

Of course, we are not the first in economics to consider norms and attempt to measure them. It has become fairly common practice to refer to "social norms" or "internalized social norms" when discussing experimental (or field) data that appear unexplainable by existing economic theories of behavior. Essentially, much of this literature has used 'social norms' as a black box meant to capture some of the influence of the social environment on individuals' decisions. Only a few attempts have been made to obtain direct evidence about what the norm involves and whether the decision-makers involved perceive the norm to be at work.[6] We are perhaps the first to be able to differentiate clearly and in a conceptually-clean manner between social and moral norms in the laboratory. In this respect, a second major contribution of our paper is that our design allows us to observe both social and moral norms in the laboratory and to disentangle their effects.[7] Finally, while there is existing evidence that social observability induces less selfish behavior, we show that advice anchors the direction in which social observability affects behavior.

Ours is an attempt to open the black box and to provide experimental tools that allow researchers to better understand the content and consequences of social norms and to distinguish

[5] We thank Erin Krupka for pointing this out to us.
[6] Some attempts that have been made will be discussed below.
[7] There are also other norm variants. For example, observing behavior of others (as in the case of conditional cooperation) can trigger quasi-moral norms; legal norms indicate explicit punishments for violations, while conventions require no sanctioning of violators. We exclude such norms by design.

these from moral norms. In our experiments we use two tools to do so. First, we facilitate a shared understanding about the action that is deemed to be appropriate, by providing impartial advice by the decision-maker's peers. Second, we manipulate the social salience of a decision by varying the extent to which others can observe it. Note that this sets up a third characteristic of our design: because we know what advice is given, we can measure the shared understanding concerning appropriate action. Measuring this shared understanding is a necessary condition for knowing the norm and, hence, for a proper analysis of its effects. Of course, whether impartial peer advice actually creates a shared understanding in this respect is an empirical matter, and we will provide evidence that the advice given does indeed do so. Given the results in the previous literature, we hypothesized that norms would work against purely selfish behavior.

One might therefore expect that choices are less selfish when advice is given and also when choices are public rather than private; the effect seems likely to be largest when these forces are combined. We do in fact find a very significant effect of advice (i.e., the shared understanding), but only when the action taken will be made public. This suggests that we do not observe an effect from advice on one's moral norms *per se*, since such an effect should affect decisions even without observability. The combined effect is substantial, however, with considerably less self-interested behavior when there is both a shared understanding and behavior is observable. In addition, the results indicate that women are somewhat more sensitive to the advice received. These results are not consistent with the leading social-preference models, since these prescribe that one's own preferences should be unaffected by the desires of others who can observe the choice made, but who are not financially affected by it.[8]

[8] They may, however, be affected by one's *expectations* about another party's expectations, as with guilt aversion in Charness and Dufwenberg (2006).

The remainder of the paper is organized as follows. Section 2 presents the experimental literature on social norms, followed in section 3 by a presentation of our experimental design. We describe our experimental results in section 4 and offer some discussion and conclude in section 5.

2. Previous Literature

Although the study of (social) norms and their effects has been much more common in sociology,[9] economists have increasingly acknowledged the important role they can play in economic decision-making.[10] Early attempts to theoretically capture this role include Akerlof (1980) and Lindbeck, Nyberg and Weibull (1999). Both show how social norms can affect behavior in the labor market in a way that contradicts traditional economic intuition. Akerlof (referring to "social customs") sees such norms as an explanation for the persistence of fair (as opposed to market-clearing) wages. Lindbeck *et al*. argue that social norms such as that one should "live off one's own work" help explain why modern welfare states need not collapse under the weight of excessive welfare claims.

Social norms and their enforcement are often cited in work in experimental economics. For example, Ostrom (2000) argues that laboratory data show how norms can evolve to support cooperative behavior in common pool dilemmas. The literature on punishment in public goods games regenerated by Fehr and Gächter (2000a, 2000b) is based on the premise that punishment

[9] For an example and references, see Coleman (1988), which is a classic and widely-cited study that systematically analyzes social norms and their role in social capital. For a classic example in psychology, see Schwartz (1973).
[10] Bendor and Swistak (2001) investigate the issue of why there are norms, and show how social norms can be derived from principles of boundedly-rational choice as mechanisms that are needed to stabilize behaviors in many evolutionary games.

of low contributors serves to enforce a norm of social behavior.[11] Some noteworthy attempts in the experimental-economics literature to carefully define social norms implicitly make Elster's (2009) distinction between moral and social norms by stressing the 'social' part. Ostrom (2000) stresses: "social norms are *shared* understandings about actions that are obligatory, permitted, or forbidden" (pp. 143-144; italics are ours). Fehr and Gächter's (2000b) definition includes the notion that social norms involve a "shared belief" and are enforced by "informal social sanctions". Finally, in their classic study on giving in dictator games, Hoffman, McCabe and Smith (1996) manipulate the effects of (social) norms in a design that varies the social distance between the dictator and the experimenter. This implicitly focuses on the 'social' aspect of these norms.

As mentioned above, norms remain a black box in much of the literature. More specifically, we distinguish three problems. First, it often happens that the introduction of a norm as an explanation for observed behavior is made without a discussion of (i) why a norm might develop; (ii) what the norm involves; and (iii) why it should apply to the experimental environment under investigation. Second, authors rarely define what they mean by a (social or other) norm; notable exceptions are discussed below. The relationship between a norm and behavior then remains at an intuitive level. Third, because the experimenter does not have direct information about the norm that an individual decision-maker feels is applicable to an experimental environment, this norm then becomes a 'homegrown restriction' on the values induced in the

[11] An example of this line of literature is Fehr and Fischbacher (2004). They provide a major contribution to understanding the role of enforcement mechanisms in maintaining social norms, but rely on the "idea that social norms apply" (p. 65). Though such studies on enforcement are crucial for understanding why norms persist, they do not allow us to study the characteristics of norms *per se*. While the notion of social norms is frequently mentioned in the paper, the main analysis is not informative about the social norms themselves.

experiment. This implies a loss of experimental control and may therefore harm the internal validity of the experimental design. Our experiment is designed to avoid these three problems.

Whereas ours is an attempt to directly measure norms in a laboratory environment, the typical approach in previous attempts has been to indirectly derive the norms that are at work from subjects' choices (cf. the Fischbacher and Fehr 2004 example in fn. 11). An exception to this practice is recent work by Erin Krupka and her co-authors (e.g., Krupka and Weber 2010; Burks and Krupka 2011).[12] They attempt to derive independent information about norms by having a group of subjects participate in set of coordination games. The basic idea is as follows. They measure the extent to which actions are socially appropriate or inappropriate by presenting respondents with a description of a choice environment, including a set of possible available actions. Then everyone is asked to evaluate the (in)appropriateness of this action. If one's appropriateness rating for a given action is the same as the modal response in the experiment, then one obtains a monetary prize.

The authors assume that a social norm provides a focal point to make the choice most in line with this norm the expected equilibrium in the coordination game. Note, however, that this assumption cannot be directly corroborated. Coordination on any response category is in fact an equilibrium of this game. Moreover, information about the norm is dependent on the cases selected by the researcher in the first place.[13] Nevertheless, this method provides an interesting attempt to incentivize the elicitation of information on the content of social norms. Note that our elicitation of this information is much more direct, i.e., through peer advice. To discover the

[12] In particular, Burks and Krupka (2012) is closely related to ethical (moral) norms and discusses differences between social and moral norms. Krupka and Weber (2010) use their approach to explain dictator game behavior in several different studies.

[13] In most of the cited papers, researchers select only some elements of the full action space. However, Krupka and Weber (2010) are able to offer the entire action space for rating by the participants.

norm, we simply ask advisors to tell others what the norm is. Later in the paper we provide evidence that suggests that this advice represents a norm.

Reuben and Riedl (2011) is an example of a study that combines independent (direct) elicitation of norms with indirect derivation from subjects' choices. They investigate contribution norms in a laboratory public-goods game and use a (non-incentivized) survey of individuals from the same subject pool to collect independent information about the norms that apply. They use their laboratory data on punishment to determine which of the norms elicited in the survey play a role. Their definition of a social norm is adjusted to this interactive setting, with a social norm defined as a behavioral rule that is known to exist and that motivates those involved to follow the rule under the condition that (a) it is believed that sufficiently many others also do so, and either (b) it is believed that sufficiently many others expect one to follow the rule, or (b') it is believed that sufficiently many others are willing to sanction deviations from the rule.[14] Note that it remains unclear in this setup whether the punisher and person being punished share an understanding about what one ought to do. For example, a participant in these experiments may well disagree that a contribution norm exists, but adhere to it to avoid the costs of being punished.

The literature also shows studies where either of our tools (advice or observed choices) is used in a different context. For example, there have been previous experiments involving an agent (or agents) offering advice or expressing preferences. These have involved self-interested agents, however, whose material payoffs depend on the choice made by the person receiving ad-

[14] This definition allows for the possibility that a norm exists without adherence. Some argue that one should distinguish between 'descriptive norms' and 'injunctive norms' (e.g., Bicchieri 2006, Cialdini et al. 1990, Deutsch and Gerard 1955). The latter prescribe behavior, while descriptive norms basically describe what people do. It is not clear to us that this distinction is useful. In Elster's definition all norms are injunctive. This does not mean that people adhere to them in all situations, however. For example, in a standard model of preferences and restrictions, selfish behavior may be chosen even if one acknowledges that the norm is to act unselfishly.

vice.[15] However, it is not obvious that a decision-maker would or should consider advice by an interested party to constitute a shared understanding about what one ought to do in a specific situation.[16] There are also experiments involving a third (or even fourth) party who observes (but is not directly affected by) the choice by an agent and can choose to punish perceived malfeasance; note that these do not include a shared understanding. These studies show that impartial observers are willing to punish, presumably when they feel that a norm has been violated.[17] They do not, however, create a shared understanding about what the norm is, nor do they provide the experimenter with information about this norm.

We are aware of one interesting and early study that considers the effect of having one's choice become public to a large group. Dufwenberg and Muren (2006) consider how a person's generosity depends on the degree of anonymity between giver and recipient, as well as on the parties' sexes. They conduct a dictator game in a large class in Sweden, drawing only some of the responses at random for actual payment. Interestingly, they find that *less* is given when the dictator is paid on stage rather than in private; men receive less than women; fewer men than women give non-zero amounts. Given this result and the Eckel and Grossman (1998) finding

[15] Schotter and Sopher (2003, 2006, 2007) and Chaudhuri, Schotter, and Sopher (2009) investigate the effect of advice in 'intergenerational' games in which the advisor has a financial interest in the strategic decision made by the advisee. In Charness and Rabin (2005), recipients in dictator games and responders in sequential games can express their preferences over the binary choices available to the other player.

[16] Konow (2000, 2003) provides extensive discussions about distributive justice. One related point is that being overly self-interested can result in a form of cognitive dissonance. One would expect this dissonance to be greater when norms are made more salient and the action taken is nevertheless self-interested.

[17] Observer (or audience) effects that did not involve direct punishment have been observed in Charness, Rigotti, and Rustichini (2007) and Andreoni and Bernheim (2009); an early experiment on observability without punishment is Rege and Telle (2006). Fehr and Fischbacher (2004) allow third-party observers of a Prisoner's dilemma to punish (at a cost) either player, with about half punishing a defector when the other player has cooperated. Charness, Cobo-Reyes, and Jiménez (2008) investigate costly third-party punishment and reward in a 'trust' game, finding that responders return a higher proportion of the amount sent to them when there is the possibility of punishment. In Coffman (2011), a fourth party can punish (at no cost) a dictator who has either chosen an allocation or chosen to unilaterally 'sell' the game to a second party; in either case, a third person receives the eventual allocation made. There is less punishment when the dictator delegates.

that females give more in dictator games, we anticipated possible gender differences across conditions.[18]

So while there are experiments in which self-interested parties make recommendations, experiments in which non-self-interested observers can choose monetary punishments, and experiments that consider public observation of a choice, we are unaware of any study in which a shared understanding is induced through public and impartial advice and people are subject to only social or moral sanctions.[19]

3. Experimental Design Issues and Implementation

Our experiments were conducted at the University of Amsterdam, using a 2x2 design that varied whether advice was given and whether the dictator action taken was made public. There were 345 participants in total; 255 of these were in choice groups, while 90 only gave advice. Each participant received an initial endowment of €16. The experiment took approximately 25 minutes and the average earnings were €14.66.

People were formed into groups of three.[20] There were 16 sessions in all. Table 1 summarizes the numbers of observations per treatment. Each 'advice group' gave advice to one or two other groups (depending on the number of participants in a session), with the advice necessarily the same in both cases when there were two. Specifically, with 3N participants, the groups were randomly numbered 1, 2, ….N. Group 1 gave advice to groups 2 and 3, group 4

[18] For a review of the large experimental literature on gender differences see Croson and Gneezy (2009).
[19] The closest is a study by Masclet, Noussair, Tucker, and Villeval (2003) that involve non-monetary sanctions (costless 'punishment points') in a public-goods game; these sanctions are related to violations of social norms. However, no shared understandings are induced.
[20] We chose to use groups of three to diminish the chance that 'homegrown' norms are dominant in our experiment. By 'homegrown' we mean a norm concerning this situation that an individual brought into the laboratory. With groups of two, for example, many subject may consider it 'the right thing to do' to split a pie evenly. This would add substantial noise to the inducement of norms at which our design aims. As we will argue below, the chance of homegrown norms playing a role in our design is low.

gave advice to groups 5 and 6, etc. If there were 15 participants, group 4 only gave advice to group 5. With 21 participants, group 7 formulated a recommendation but this was not passed on to any other group. The members of an advice group could communicate via chat box for 300 seconds and then make a selection (if each person made a different choice, another 60 seconds of chat would follow; in practice, this was never necessary). The advice came in the form of a recommendation to choose one of the six feasible options concerning how to allocate payoffs amongst the affected groups. The members of a choice group did not communicate; instead, one of the three members was randomly appointed to be a dictator and made a choice unilaterally.

Table 1: Treatments

	Private Payoff	Public Payoff
No Advice	**NPR** 17 dictators	**NPU** 20 dictators
Advice	**APR** 25 dictators, 17 advice groups	**APU** 23 dictators, 13 advice groups

*Because of subject turnout, some groups' advice was not passed on to any choice group (see the main text). Two advice groups were not used in APR and one advice group was not used in APU.

The comparative statics in this design will allow us to isolate the effects of moral and social norms. This is explained in more detail, after discussing the procedures.

Table 2: Choices available to the dictator

Choice	A	B	C	D	E	F
Own payoff	8	4	0	-4	-8	-12
Payoff to player 2	0	4	8	8	4	0
Payoff to player 3	-16	-12	-8	-4	0	4

Each dictator made a choice from six possible alternatives, which varied in terms of own payoff consequences and the payoff consequences for the other two people in her choice group. These feasible choices are shown in Table 2. The numbers follow directly from a model where each player has an optimal choice in terms of own monetary payoffs (A for the dictator, C or D

for player 2 and F for player 3) and deviations from the optimum by one step diminish these payoffs by 4. A dictator only interested in the own earnings will choose A. If she attributes positive weight to the well-being of others, it is unclear what choice is optimal. A consequence is that the role of homegrown norms that the dictators apply to this situation is expected to be small. If such homegrown norms do play a role, they are likely to differ across dictators. This shows up directly if we apply various models of social preferences.

First, we briefly mention what various models of distributional preferences indicate would be chosen by a non-self-interested party (like a member of an advice group).[21] A (hypothetical) non-self-interested central planner with Fehr and Schmidt (1999) preferences would minimize the sum of the pairwise differences between payoffs, so that option D or E is best.[22] If this person had Charness and Rabin (2002) quasi-maximin (social-welfare) preferences, both the sum of the payoffs and the minimum payoff would come into play.[23] Both C and D provide a total payoff of 0, higher than any of the other choices; D also provides the highest minimum payoff (-4) of any of the choices. Thus, a non-self-interested party who has Charness-Rabin distributional social preferences should choose D.

Predictions for the dictators in the choice groups will vary according to the parameter values of the social preferences under consideration. For example, the choice by a dictator with standard Fehr-Schmidt preferences depends on the extent of inequity aversion. With an

[21] Previous work on this issue includes Frohlich and Oppenheimer (1984, 1992), who examine the allocations made to a group of individuals by decision-makers who do not know which payoff would be theirs, and Charness and Rabin (2002), who consider allocations made by an individual who does not know his or her own payoff, but chooses for two anonymous others (see games Barc10 and Barc12). These studies find that people reach agreements that tend to maximize total payoffs, while observing an income floor for individuals in the group.

[22] If this person instead had Bolton and Ockenfels (2000) preferences, he or she would consider the ratio of one person's payoff to the total, seeking to keep these as close to 1/3 as possible. However, this is less easy to analyze. For example, the total payoff is the case of options C or D is 0, so that ratios are somewhat arbitrary. Thus, we do not discuss this model further.

[23] See the appendix to Charness and Rabin (2002), where the real model is presented.

advantageous inequity-aversion parameter equal to 0.6 and advantageous inequity parameter equal to 1 or 4 (40% of the subjects categorized in Fehr and Schmidt 1999) would choose B. Lower inequity aversion would lead to A being chosen.

All in all, it is not clear what a non-self-interested dictator should do, because various models differ in their assessment of what is the right thing to do.[24] This means that, *a priori*, there is uncertainty about the norm. In our design, advice serves to reduce this uncertainty. Since a dictator is quite likely to be more concerned with her own earnings than anyone else is, advice will tend to allocate less to the dictator than she would choose herself, even if she has pro-social preferences. If this advice indeed creates a shared understanding, then the corresponding social norm will tend to make the dictator's choice less selfish (later letters in the alphabet).

The experimental procedures were as follows. After being randomly seated, players received computerized instructions (see Appendix A for a translation). These stated that they would be allocated to groups of three participants (each group consisting of a Red, a Blue, and a Green player). They were informed that Blue and Green would not make any decision in the experiment and that Red would decide on a column of the payoff matrix given above (Table 2). They knew that this was a one-shot decision only. In the treatments with advice, each person also received these instructions:

> "We imagine that it may be difficult for Red [the dictator] to decide what one ought to do in this situation. We will therefore randomly select a few groups and have them formulate advice. The groups that give advice will not subsequently choose from the options. Each member of an advice group will therefore earn exactly €16 in this experiment. The advice by every group may be passed on to more than one group. The advice reads: 'The group that was asked to advise informs you that red ought to choose … in this situation [where we substitute the advised option (A, B, C, D, E, F) for the dots]'".

[24] Before running the experiment, we asked 15-20 colleagues to indicate what they thought was the right thing to do for a dictator faced with these options. Similar to what is observed in our advice groups (see below), responses varied between A and E.

It is central to our analysis that the advice given through these procedures indicates to the receiver what the norm is for the decision at hand. This is based on three key aspects of our design. First, as argued above, there is *a priori* uncertainty about what the norm is for the decision at hand. Second, advice groups are explicitly instructed to advise what the dictator "ought to do". Third, as we will show below, the advice creates a shared understanding about what one ought to do, which is at the core of our (and Elster's) conceptualization of norms.[25] Note that the advice provides a very minimum measure of the norm, however, because no information is provided to the dictator about *why* the advised option is the right thing to do. Thus, we measure an effect of norms that most likely underestimates the effect norms could have under full communication between the advice group and the dictator. Further, note that it was common information that the advice was generated through discussion by a group of three people, so that this strengthens the case for the advice constituting a norm.

In the case of public payoffs, further instructions read:

> "Today's payoffs are organized differently than you may be used to at CREED. At the end of the experiment, you will be called forward one by one. We will then publicly announce your role today, what you decided, and how much you earned. Payoffs today are therefore not private and anonymous."

When a participant came forward, all monitors showed the role and decision. Participants had to return to their seats and wait until everyone had been paid.[26]

[25] We do not claim that advice will reduce to zero the uncertainty about what one ought to do. Because some noise will remain, some advice groups will provide a different assessment of the norm than others. Our claim, however, is that for any individual dictator, the advice received from three peers who have discussed the problem will provide a strong signal about the norm that is in place. Our results support this claim.

[26] Note that we did not make advice public. Hence, in the public payoff case, others could only observe the decision made, not the advice that the dictator had received. We chose this private information case to avoid confusing the norm of what to do with the more general norm of following advice *per se*.

In each of the treatment cells depicted in Table 1, the dictator faces a complex decision where many aspects could affect her choice (e.g., diverse homegrown norms, notions of equity, etc.). Our conclusions about moral and social norms are based on comparisons between cells. The experimental design provides four such comparative statics. First, comparing NPR to APR provides information about induced moral norms (i.e., a norm that was created in the laboratory), since the only difference between these treatments is that the advice groups communicate norms only in APR. These can only reflect moral norms, because actions are not observable in these treatments. Similarly, any difference between NPU and APU could also reflect induced moral norms, but in this case it could also be a consequence of induced social norms because decisions are observable in these treatments.

Differences between NPR and NPU reflect homegrown social norms, because dictators are not provided with information about the norm and so have to decide based on their prior ideas. If these prior ideas are different when actions are observable than when they are not, homegrown social norms are in play. Finally, a comparison between APR and APU offers insight about homegrown or induced social norms (holding advice constant), as now differences might be due to prior ideas or to ideas generated by the advice. Using these comparisons, difference-in-difference analysis allows us to isolate the effects of moral and social norms. For example, comparing differences between NPR and APU and between NPU and APU will allow us to isolate the additional effect of social norms from the effect of moral norms on behavior.[27]

[27] Our design will not allow us to distinguish between induced moral norms and some other effect of (private) advice. It is difficult to imagine ways to make this distinction, however.

4. Results

We find substantial differences in the allocation choice selected, depending on whether advice was given and whether payoffs were public or private. Table 3 presents the percentage of choices in each category for each treatment.

Table 3: Distribution of choices, by treatment

	A	B	C	D	E	F
No advice, private	.706	.294	.000	.000	.000	.000
No advice, public	.550	.350	.100	.000	.000	.000
Advice, private	.640	.320	.040	.000	.000	.000
Advice, public	.391	.217	.261	.131	.000	.000

We see that no choice of E or F was ever made. Furthermore, the only instances in which a dictator chose a negative own payoff (option D) was when advice was given and the choice was public. When there was no advice and payoffs were private, more than 70% of all choices were entirely selfish, with the remainder in the next-most-selfish category. Across the four treatments, the differences are significantly different (Kruskal Wallis, $\chi^2 = 9.179$, two-tailed $p = 0.027$.[28] Pairwise Wilcoxon rank-sum tests across treatments show significant differences between the choices made in the advice/public treatment and each of the other three treatments. None of the other pairwise comparisons are significant.[29]

If we compare all choices with public payoffs to all choices with private payoffs, the rank-sum test gives $Z = 2.457$, $p = 0.007$ (one-tailed test). If we compare all choices with advice to all choices with no advice, the rank-sum test gives $Z = 1.388$, $p = 0.083$ (one-tailed test). So at

[28] For numerical analysis we convert the options to numeric form such that A=1, B=2, etc. The underlying assumption is that the dictator choices are ordinal: moving from A to B, etc., the dictator gives up more of her own monetary earnings in favor of others'.

[29] We find $Z = 2.513$, $p = 0.006$, for APU versus NPR, $Z = 1.722$, $p = 0.043$, for APU versus NPU, and $Z = 2.404$, $p = 0.008$, for APU versus APR (all tests are one-tailed, in keeping with our directional hypotheses). For the comparisons between NPU and NPR, APR and NPR, and APR and NPU, we have Z = 1.127, Z = 0.515, and Z = -0.714, respectively).

first glance it seems that observability has a stronger effect than advice. Nevertheless, advice is important and it is instructive to see its effects and to test whether the advice given is independent of whether payoffs are public or private.

In fact, taking the last question first, advice is quite sensitive to the exposure of the choices made.[30] When the payoffs were private, two groups, seven groups, four groups, and one group recommended A, B, C, and D, respectively; when the payoffs were public, two groups, one group, seven groups, and three groups recommended A, B, C, and D, respectively. A Chi-square test (grouping A with B and C with D, so as to have a sufficient number of observations in each cell) gives $\chi_1^2 = 4.638$, $p = 0.031$, so that advice is significantly more in the direction of non-selfishness when the payoffs are public. Thus, the advice given depends on whether the subsequent choice will be made public.[31]

We find this result to be interesting and revealing. It seems that advisors themselves distinguish between moral and social norms. The difference in advice across conditions of observability means that advisors are sensitive to the social circumstance of having one's dictator choice made public to everyone in the room. While there may (or may not) be a moral background to the advice given, advisors seem to be recommending against some form of social embarrassment.[32] In fact, it shows that there is actually a shared understanding of the social aspect of one's peers knowing one's choice. And we see no obvious reason why moral norms

[30] In the following analysis we disregard advice groups whose advice was not passed on to any choice group (see table 1).

[31] Interestingly, the degree of consensus on the norm also appears to be less clear in the public case (note that those receiving advice did not know whether it was unanimous). There were 12 advice groups with private payoff. Three of these had a split decision (2-1). There were 17 advice groups with public payoff and 8 of these had a split decision. The difference in rates is large, at 47% versus 25% (however, this difference is not statistically significant, Z = 1.21, as the number of observations is rather small).

[32] A conjecture is that they don't want their advisee to look bad because it reflects on them; however, note that knowing the identity of the dictator did not pin down the identity of the advisors.

would depend on exposure of one's choice, so the observed difference would appear to unequivocally reflect social norms.

How do choosers react to advice? Table 4 shows the responses to specific advice in the treatments with public and private payoffs. As indicated above, the advice given depends on the treatment. Eighteen of 23 groups (78.3%) received recommendations (from 13 distinct advice groups) to choose C or D with public payoffs, compared to eight of 25 groups (32.0%) receiving recommendations (from 14 advice groups) with private payoffs.[33] This difference in proportions is statistically significantly ($Z = 3.213$, $p = 0.001$, one-tailed test), a matter that we must take into account when interpreting advice as inducing norms.

Table 4: Advice and responses

	Number of responses			
Advice given, Public payoffs	A	B	C	D
A	2		1	
B	1	1		
C	4	4	4	
D	2		1	3
	Number of responses			
Advice given, Private payoffs	A	B	C	D
A	3		1	
B	7	6		
C	5	1		
D	1		1	

Many people (10 of 23, or 43.5%, with public payoffs; nine of 25, or 36.0%, with Private payoffs) respond to the advice by choosing it.[34,35] Of the remaining choice groups, in only one case in each treatment does any group choose to be less self-interested, with the remaining

[33] Note that the numbers concerning advice received are different than the numbers given in the previous paragraph on advice given because advice was often given to two groups.

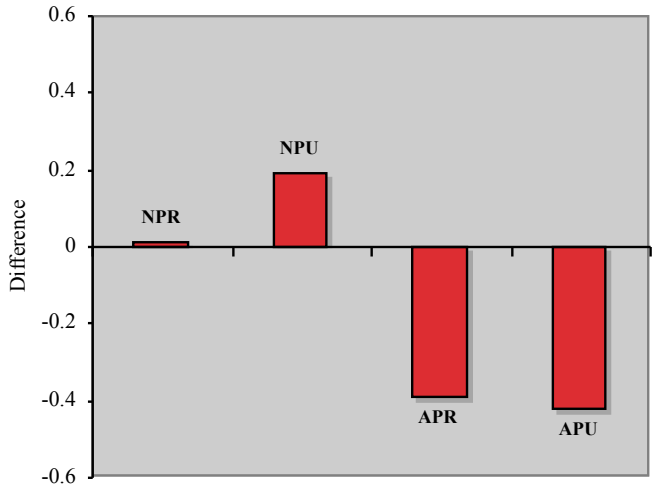
[34] To the extent that stakeholders such as these dictators are self-deceptive (see for example Konow, 2000), having an impartial third party increases the 'cost' of self-deception, resulting in less selfish behavior.

[35] It is unlikely that differences across treatments could be caused by an experimenter demand effect. This experiment did not use double blind procedures; in all treatments, the experimenter could know the dictator's decision when paying her.

groups choosing to be more self-interested than the recommendation; the binomial test finds that this deviation pattern far from random ($Z = 5.014$, $p < 0.001$). The difference between the advice given and the choice is 0.783 categories on average (standard error = 0.243) with public payoffs. With private payoffs the average difference is 0.840 categories (standard error = 0.189). Thus, there is no difference across treatments in the deviation from the advice given.

Let us now examine differences in behavior across gender. First, there is no overall difference in the choices made by males and females – the average choice made by males was 1.583 and the average choice made by females was 1.649. A rank-sum test gives $Z = 0.328$, $p = 0.743$. However, we see differences across advice conditions in the difference between male and female choices, as can be seen in Figure 1.

Figure 1: Male-female difference across treatments



When there is no advice, the average choice by males was 1.476 and the average choice by females was 1.375, so males are less self-regarding by 0.101; on the other hand, when there is advice, the average choice by males was 1.667 and the average choice by females was 1.857, so males are more self-regarding by 0.190. Thus, the difference-in-difference is 0.291, so we see

that female participants are much more affected by the advice given.[36] Instead of being slightly more self-regarding in the treatments without advice, they are considerably less self-regarding after receiving advice. It appears that females in our experiment are substantially more sensitive to the norms expressed by their peers, whether these are moral or social.

With respect to the deviations from the advice given (mentioned in the preceding paragraph), we also find that female choices differ less than do male choices from the advice received. On average, males deviate from the advice over 50% more than females (0.963 versus 0.619 categories).[37]

To interpret our results in terms of moral versus social norms, we return to our design table and enter the average numerical values of dictators' choices (Table 6). As discussed, the difference between the condition with advice with public payoffs (APU) and each and every other condition is statistically significant, while no other pairwise comparison comes close to being statistically significant.[38]

Table 6: Average Choices

	Private Payoff	Public Payoff
No Advice	**NPR**: 1.29 (0.114)	**NPU**: 1.55 (0.153)
Advice	**APR**: 1.40 (0.115)	**APU**: 2.13 (0.229)

The number in each cell is the average numerical value of the choice made.
Standard errors are in parentheses

As argued above, the significant difference between NPU and APU indicates that advice induces either a moral norm or a social norm. From the significant effect of public exposure

[36] Regressing the deviation from the advice given on a public payoff dummy, the advice received and gender (using ordered probit) gives a coefficient of –0.604, with $p = 0.040$ (one-sided test).
[37] Although this difference is not statistically significant (Mann-Whitney, $p = 0.278$) when using a non-parametric test, it is significant when controlling for other variables in a regression (cf. fn. 36).
[38] Note that the difference between the average choices between the treatments with no advice and advice is much larger (0.5 versus 0.1) with public payoffs than with private payoffs, further illustrating that advice matters primarily when payoffs are public.

when advice has been given (APR versus APU), we conclude that (holding advice constant) there are either homegrown social norms at work, or we have induced a social norm. On the other hand, the lack of difference between NPR and APR implies that there are no induced moral norms/effect of advice and the lack of difference between NPR and NPU suggests that there is no homegrown social norm at work. Thus, the explanation that is most consistent with the data is that the combination of advice (shared understanding) and public payoff (observability) has induced a social norm to which participants adhere.

To further investigate the extent to which we have created a social norm in the laboratory, we need to corroborate whether we have created both observability and a shared understanding about what one ought to do. The former seems trivial in our public-payoff treatment. As for a shared understanding, first note that we purposefully used a game where the social norm is *a priori* unclear, hence a shared norm does not seem to exist (though individual subjects may believe that it does). This is apparent, for example, from the diversity in advice given (e.g., between the public- and private-payoff treatments). This does not mean that the advice fails to create shared understanding, however. The issue is not whether all subjects agree *ex post* about what is the right thing to do. As argued above, this decision environment is uncommon and only noisy information about the norm at hand can be generated. The issue is, whether the advice constitutes a shared understanding between an advice group and the decision groups to which it is linked. Our results show that dictators steer their decisions towards the advice received. This in itself provides strong evidence that such shared understandings have indeed been created.

To further investigate whether we created a shared understanding, we use responses to a post-experimental questionnaire. One of the questions asked was: “What do you think red should choose in this experiment?”. This question does not directly ask about a perceived norm but

combines the effect of a (social) norm governing red's choice with any perceived tradeoff for red between this norm and selfish considerations. If the advice creates a shared understanding about the norm, then a response to this question should be positively related to the advice received. All participants responded to this. A Spearman test finds a significant correlation between the response given and the advice received ($p < 0.001$) and an ordered probit regression of the response on the advice received yields a positive coefficient of 0.642 with $p < 0.001$. Hence, the advice appears to strongly affect what participants believe red should do.

We can delve a bit more deeply into the data and also look at the variance in the choices made with and without advice. To the extent that advice has created a shared understanding, we should expect the spread of the data to be reduced by advice. To investigate this, we consider the standard deviation of the response to the survey question about what red ought to do. Table 7 shows for each of the four treatments the mean and the standard deviation of the response to the question of what red ought to do in this experiment. We also normalize the standard deviation by dividing the standard deviation by the mean.[39]

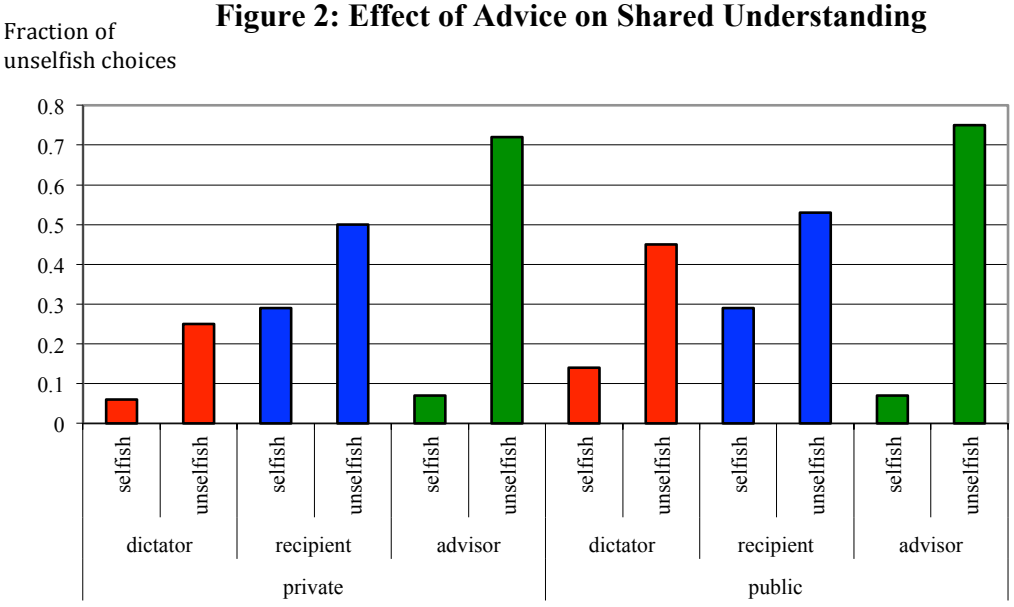
Table 7: Questionnaire responses for prescriptive choice

Treatment (obs.)	Average choice	Standard deviation	Normalized Standard dev.
NPR	1.490	0.809	0.543
APR	2.016	1.008	0.500
NPU	1.733	0.972	0.561
APU	2.364	1.121	0.474

[39] As an illustration, consider a variable with a mean of 50 and a standard deviation of two and another variable with a mean of five and a standard deviation of one. The data are relatively more concentrated in the first case, even though the absolute standard deviation is higher.

We see that the normalized standard error is lower when there is advice. With private choice, this is 8.6% higher without advice than with advice; with public choice, the normalized standard error is 18.4% higher without advice than with advice. This suggests that advice does reduce the variation to at least a modest extent. This is particularly true when the choice will be made public, as befits a social norm. Note that for APR and APU the normalized standard deviation underestimates the convergence to a shared understanding about what red ought to do. Because the advice differs across groups, we would measure a positive standard deviation even if everyone fully agreed that the advice they received constitutes the social norm. This underestimation does not occur for the treatments without advice. We therefore see the differences in the normalized standard deviation depicted in Table 7 as a lower bound for the extent to which advice creates a shared understanding.

Figure 2: Effect of Advice on Shared Understanding



Notes: bars show the fraction of respondents that responds with categories C or D to a post-experimental question on what the right thing is for red to do. "Selfish" ("unselfish") indicates that the advice was to choose A or B (C or D). An 'advisor' was a member of an advice-giving group. The distinction private-public (the left and right sides of the Figure) refers to the unobservability vs. observability of choices.

For a more detailed look at this effect of advice, we dichotomize the decisions (and advice) into 'selfish' (categories A or B) and 'unselfish' (C or D). We then consider whether advice to be unselfish will lead to more responses that red should choose unselfishly. Figure 2 shows the results, disaggregated by the observability of decisions and the role of the respondent in the experiment (dictator, recipient, or advisor).

For each type of respondent to the questionnaire, the difference between the height of the bars for "selfish" and for "unselfish" shows the sensitivity to the advice received. In all six cases, respondents believe that Red should choose less selfishly after receiving unselfish advice than after receiving selfish advice. Unsurprisingly, the difference is largest for advisors, since they are the ones having given advice in the first place.

Comparing across public and private conditions, there is more sensitivity for each type of respondent with public choices for all types of respondent. However, the difference is just slightly larger for recipients and advisors when the choice is public than when it is private, but it is substantial for individuals who had had the role of dictator. This would imply that dictators who have had their choices exposed to the group feel it is more important for a dictator to be sensitive to the advice received when the choice will be made public. Across all respondents, the Pearson correlation coefficient between the advice received and the perception of what is the right thing to do is 0.327, which is statistically significantly different from 0 ($p < 0.001$). All in all, from this post-experimental questionnaire it appears that the advice given does coordinate beliefs about what the dictator ought to do. In this respect it contributes to a shared understanding and, hence, a norm.[40]

[40] Of course, one should take care in interpreting responses to a hypothetical question. Nevertheless, the correlation between advice and stated understandings is remarkable. Moreover, it is supported by the fact that actual dictator choices responded to advice in a similar way.

All in all, the responses to this post-experimental questionnaire provide support for the validity of our experimental inducement of norms through impartial peer advice.

5. Conclusion

The influence of norms on behavior is an important issue in economics, with applications to areas such as labor markets, welfare economics, and common pool dilemmas. Elster (2009) defines a social norm as an injunction on behavior that is sustained by the threat of sanctions or social disapproval. He defines moral norms as internalized norms that are sustained by guilt or remorse and do not depend on observation. Since agents' behavior in the field may or may not be observed, both types of norm can potentially come into play in field settings.

We use a novel experimental design to study the influence of norms on behavior and to distinguish between social and moral norms. We have argued that a social norm requires a shared understanding about what one ought to do in a specific situation as well as observability of one's actions. Here there are degrees to which a decision-maker can sacrifice own payoffs to achieve an outcome that is more favorable to the other paired participants. *A priori*, there appears to be no clear norm to guide one's choice; here we induce a norm by providing impartial advice from one's peers. We have provided evidence that this advice does indeed create the shared understandings needed to create a norm. This is made a social norm when one knows that one's choice will face public inspection. In our design, advice is provided by a group of three people; the fact that it is three people rather than only one individual strengthens the sense of the advice being normative and helps to explain how a norm is created. Indeed, we find that when one's decision is observed, there is a tendency to choose more in line with the advice received. A moral norm is induced through advice given to the dictator if her choice is not made public. We observe no such effect of advice without observation.

We do not find overall support for the notion that females are less self-regarding than males. In fact, there is a slight tendency in the opposite direction when choices are no advice is provided. However, we do find a substantial and significant difference in choices when advice is given and in the degree to which males and females deviate from this advice. Perhaps it is the case that females are more sensitive than males to the views of others and so are more willing to accommodate them with less selfish choices. It would be interesting to see if this also held true in an environment where the advice is to be *more* selfish than one's own view.

Previous work has generally focused on social norms, without making explicit what are these norms or why they would play a role if others do not observe behavior. Studies involving advice have always involved self-interest on the part of the advisor, so that it remains unclear whether they create a shared understanding. Our design permits us to identify and disentangle the separate effects of social and moral norms by carefully creating a shared understanding and manipulating the observability of decisions; to the best of our knowledge, our study is the first to do so.

Social norms are found to affect behavior. While many previous studies have provided indirect evidence for this, our design allows us to show a direct link from the creation of a norm and the observability of choices to its effect on behavior. The combination of advice and public observation is particularly strong, in part because the advice (the norm that is created) is to be more self-sacrificing when the advisor group knows that the choice will be made public; this implies that the advisor group, while anonymous, may well feel more responsibility for the outcome in this case, despite the fact that the advice given is not made public.

We achieve our results with a rather minimal experimental design that features anonymous and unadorned advice. While we have identified substantial effects from social

norms in our data, it is clear that there is a great deal of research remaining in this important area. For one thing, the result that moral norms *per se* do not play a significant role may depend on the decision under scrutiny. There may be environments where moral norms can be induced that affect individuals' choices. We do believe that similar careful experimental research can help discover these environments.

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Appendix: Experimental Instructions

This appendix presents a translation of the (Dutch) instructions for the treatment with advice and public payoffs. Places where other treatments differ are given in brackets {…}. The instructions were presented as html-pages. These are separated by horizontal lines, below. Subjects could move from one page to the next (and back) at their own pace.

Welcome

You are about to participate in an experiment. The instructions are simple. If you follow them carefully, you may earn money. Your earnings will be paid to you in euros at the end of the experiment.

Today's payoffs are organized differently than you may be used to at CREED. At the end of the experiment, you will be called forward one by one. We will then publically announce your role today, what you decided, and how much you earned. **Payoffs today are therefore not private and anonymous**.

{In the private payoff case, the previous paragraph was replaced by "At the end of the experiment you will be privately and anonymously paid, one-by-one. Therefore, **no one will know how much you earned** today."}

All monetary amounts are in euros today.

These instructions consist of 5 {4 when there was no advice} pages like this one. While reading them, you may page back and forth by clicking 'next page' or 'previous page' at the bottom of your screen. In some cases, a page may be too large for your monitor. In that case you may use the scroll bar to read through the whole page.

next page

Groups and Roles

At the start of the experiment, we will give each participant **16 euros** as a starting capital.

Then you will be split in groups of three participants. Each group consists of one red player, one green player and one blue player. Your role will be determined completely randomly.

The composition of your group will remain anonymous. You will not know who your co-members are. Others will not know whether or not you are in their group. Similarly, no one will know which role you have. You will not know the role of others.

Only the red players will make a decision today. The green and blue players are **completely dependent** on the red player's choice for their earnings today.

The experiment consists of only one round. Each red player will therefore only be asked to make one decision.

Previous page next page

Red's decision

The **red** player in a group chooses one of six **possible options.** Each of these options gives specific amounts of money to the red, green and blue player in the group. The options are called **A, B, C, D, E, and F**. The consequences for the players are given in the following table, which will also appear on your screen during the experiment.

	ROOD	GROEN	BLAUW
A	8	0	-16
B	4	4	-12
C	0	8	-8
D	-4	8	-4
E	-8	4	0
F	-12	0	4

[Note: 'rood'=red; 'groen'=green, 'blauw'=blue]

If the **red** player chooses **option A**, **he or she will receive 8 euro**, **green will receive 0 euro and blue will lose 16 euro**.

If the **red** player chooses **option B**, **he or she will receive 4 euro**, **green will receive 4 euro and blue will lose 12 euro**.

If the **red** player chooses **option C**, **he or she will receive 0 euro**, **green will receive 8 euro and blue will lose 8 euro**.

If the **red** player chooses **option D**, **he or she will lose 4 euro**, **green will receive 8 euro and blue will lose 4 euro**.

If the **red** player chooses **option E**, **he or she will lose 8 euro**, **green will receive 4 euro and blue will receive 0 euro**.

If the **red** player chooses **option F**, **he or she will lose 12 euro**, **green will receive 0 euro and blue will receive 4 euro**.

Previous page next page

Advice {this page was skipped in the no-advice treatments]

	ROOD	GROEN	BLAUW
A	8	0	-16
B	4	4	-12
C	0	8	-8
D	-4	8	-4
E	-8	4	0
F	-12	0	4

[Note: 'rood'=red; 'groen'=green, 'blauw'=blue]

We imagine that it may be difficult for red to decide what one ought to do in this situation. We will therefore randomly select a few groups and have them **formulate advice**. The groups that give advice will **not subsequently decide from the options**. Each member of an advice group will therefore earn exactly €16 in this experiment.

The advice by every group may be passed on to **more than one group.**
The advice reads:

"**The group that was asked to advise informs you that red ought to choose … in this situation"**

where we substitute the advised option (A, B, C, D, E, F) for the dots.

Each selected groups will separate from the others arrive at an advice in the following way.

1. During **5 minutes (300 seconds)**, the members may exchange thoughts in a **chat box**.
2. Then, each of the three members must **indicate the choice** (A, B, C, D, E, or F) they would like to advise.
3. If there are **three different choices,** the process returns to step 1. There will be a new opportunity to chat. This time, the chat will be for **60 seconds**.
4. If **two or more group members make the same choice**, then that is the advice.

It is not allowed to reveal your identity during the chat.

Previous page next page

End

This brings you to the end of these instructions. After everyone has finished, we will start with the experiment.

After you have finished with these instructions, you may indicate so by clicking the 'ready' button at the bottom of your screen. After doing so, you must wait quietly until everyone has finished. This may take a little while, so we ask for your patience.

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READY