The focusing and informational effects of norms on pro-social behavior

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ABSTRACT

This paper reports an experiment examining the effect of social norms on pro-social behavior. We test two predictions derived from work in psychology regarding the influence of norms. The first is a "focusing" influence, whereby norms only impact behavior when an individual's attention is drawn to them; and the second is an "informational" influence, whereby a norm exerts a stronger impact on an individual's behavior the more others he observes behaving consistently with that norm. We find support for both effects. Either thinking about or observing the behavior of others produces increased pro-social behavior – even when one expects or observes little pro-social behavior on the part of others – and the degree of pro-social behavior is increasing in the actual and expected pro-social behavior of others. This experiment eliminates strategic influences and thus demonstrates a direct effect of norms on behavior.

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This paper addresses the influence of social norms on behavior. Social norms can be thought of as jointly-recognized agreements regarding appropriate or inappropriate behavior (Bettenhausen & Murnighan, 1991; Elster, 1989; Fehr & Schmidt, 1999; Lindbeck, Nyberg, & Weibull, 1999). Social scientists in economics, psychology, and sociology all recognize the importance of social norms in decision making,[1] and this importance is also recognized by policymakers in many important social and economic domains.[2]

A deeper examination of how and when social norms affect behavior can add to our understanding of a number of important phenomena. It can shed light on when people are likely to punish the behavior of others (Fehr & Gaechter, 2000) and on when conformity and reciprocity might play a strong role in determining behavior (Bardsley & Sausgruber, 2005; Fehr,

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[1] See, for instance, Arrow (1971), Yaari and Bar-Hillel (1984), Fehr and Schmidt (1999), Kahneman, Knetsch, and Thaler (1986), Andreoni (1990), Cialdini, Reno, and Kallgren (1990), Sunstein (1996), Kallgren, Reno, and Cialdini (2000), Chekroun and Brauer (2002), Conlin, Lynn, and O'Donoghue (2003), Camerer and Fehr (2004), Bicchieri (2005) and Kreps (1997).

[2] For instance, in 2004 the Chicago Port Authority instituted a loudspeaker system on its buses prompting patrons to be courteous (Chicago Tribune, January 27, 2004). Also, throughout the 1990's police forces shifted from squad car to foot patrols because it was thought that increased contact between civilians and officers would enhance norm-compliant behavior (Wilson & Kelling 1982). This intervention was, in part, informed by a study by Zimbardo (1969) arguing that cues in the environment could increase the prevalence of certain norm-compliant behaviors. See also Akerlof (1982), Levine (1993), Fehr, Gaechter, and Kirchsteiger (1997), Fehr, Kirchler, Weichbold, and Gachter (1998), and Maxwell, Nye, and Maxwell (1999).

Kirchler, Weichbold, & Gachter, 1998). It may also provide a basis for endogenous social interaction effects (Falk, Fischbacher, & Gaechter, 2003; Manski, 1993; Manski, 2000; Moffitt, 2001).

In the current investigation we explore how cues in the environment concerning pro-social norms affect behavior. As communities, and the individuals and leaders within them, seek ways to enforce and promote pro-social behavior, social scientists have worked to determine how precisely norms affect behavior. This paper attempts to bring new insights from psychology into how economists think about and understand social norms. In particular, we manipulate the influence and strength of norms and test whether the resulting behavior changes in the directions predicted by this previous psychological research. Unlike similar previous work in economics, we eliminate strategic considerations or extrinsic financial incentives as motives for behaving consistently with a norm, and thus explore how social norms directly influence behavior.

Recent work in psychology suggests that drawing attention to a norm, or "focusing," is a crucial component of producing norm-compliant behavior. A norm's influence is critically related to the degree to which individuals' attention is focused on the norm.[3] Individuals do not always have norms in mind, and when they don't have them in mind norms exert no effect on behavior. As one set of experiments in psychology demonstrates, this means that the influence of environmental cues on norm-compliant behavior can sometimes produce counter-intuitive patterns (Cialdini et al., 1990). For instance, observing anti-social behavior might actually produce *less* anti-social behavior (if it draws an individual's attention to the pro-social norm).

This paper describes an experiment that manipulates the influence of a norm by focusing subjects on pro-social behavior in an economic context. We find that thinking about what others will do or observing others' behavior both have a direct and positive effect on pro-social behavior even when most subjects don't think others are generous or when they observe most others behaving selfishly. We present these somewhat counter-intuitive findings as evidence of the focusing influence of norms.[4]

We also explore the more intuitive "informational" influence of norms, whereby the appropriate or norm-compliant behavior is learned by observing the actions of others. This influence predicts a positive relationship between one's action and what one observes others doing (see, for instance, Bardsley & Sausgruber, 2005; Cialdini et al., 1990; Jones, 1984). We find support for this influence: subjects generally behave more pro-socially when they observe more pro-social behavior on the part of others.

While previous economics experiments examine similar treatment variables as ours (see Section 2), all of this previous work explores behavior in multi-player games in which the direct effect of norms on behavior cannot be separated from indirect effects due to strategic considerations. We eliminate these kinds of strategic considerations by using a one-shot decision in which only one subject in each pair makes a payoff-relevant choice. This removes the possibility that our manipulations indirectly influence behavior by affecting expectations of what other players are likely to do or by leading subjects to think more strategically. In addition, unlike previous laboratory research exploring the effect of punishment or rewards on norm compliant behavior,[5] we examine factors that produce norm compliance absent concerns of reprisal or desire for extrinsic reward.

The following section reviews work on norms and, in particular, the theoretical and experimental work in psychology on focusing and spreading activation. Section 2 describes the experiment and presents the results. Section 3 discusses implications of our work and concludes.

1. Related work on norms and focusing

This section provides background on related research on norms. We focus our attention on work in psychology that directly motivates our experiment in particular, that of Cialdini et al. (1990) and Harvey and Enzle (1981).

Numerous studies in psychology demonstrate an influence of norms on behavior and that thinking about what others are going to do or observing others' actions can evoke norm-compliance.[6] Based on this body of research, Harvey and Enzle (1981), and later Cialdini and colleagues (e.g. Cialdini et al., 1990; Kallgren et al., 2000), developed a theory in which norms are influential only when an individual's attention is drawn to the norm. This theory draws on the concepts of focus and spreading activation.

In psychology, "focus" is defined as a state of heightened awareness, in which an individual finds himself after observing cues relevant to a particular concept or behavior. When someone is focused by cues he is more likely and/or faster to recall ideas, words or behaviors related to those cues even if he is consciously unaware that he has been focused. "Spreading activation theory" describes how cues in the environment can produce focusing and how focusing on one set of concepts or ideas can produce focusing on others that are closely-related (Collins & Loftus, 1975; Collins & Quillian, 1972).

Harvey and Enzle (1981) applied spreading activation to norms as a way to understand helping behavior. They posited that representations of norms are stored in memory as nodes in a network (and linked to other nodes). Access to those representations is triggered by environmental cues to which the norm applies, such as thinking about or seeing what others do.

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[3] Frohlich et al. (2004) and Conlin et al. (2003) explore how contextual features of an environment influence norm-compliant behavior. However, they do not discuss this influence in the same way as when psychologists refer to focusing (or priming), and as we do here.

[4] Moreover, our results are inconsistent with models that assert a direct and unconditional preference for pro-social outcomes (Bolton & Ockenfels, 2000; Fehr & Schmidt, 1999; Engelmann and Stobel, 2004), as opposed to a conditional preference for norm compliance or for doing as others do (Becker & Murphy, 2000; Lindbeck et al., 1999).

[5] For example, see Fehr et al. (1998), Fehr and Gaechter (2000) and Gneezy (2004).

[6] See Sherif (1935), Asch (1956), Milgram, Bickman, and Berkowitz (1969), Zimbardo (1969), Berkowitz (1972), Krauss, Freedman, and Whitcup (1978), and LaTour and Manrai (1989).

Based on spreading activation theory, Cialdini et al. (1990) tested the influence of norms on behavior in several field experiments on littering. In one experiment, the number of pieces of litter in the environment acted as the experimentally varied cue and was used as a signal of what others had previously done. Cialdini et al. predicted a "check mark" function in which the likelihood that a subject litters generally increases with the number of pieces of litter in the environment (as subjects infer the strength with which the "no littering" norm applies to the environment) but in which the frequency of litter is *higher when there is no litter in the environment than when there is one piece of litter*. They dubbed this reversal the focusing effect. The rationale behind this counter-intuitive prediction is that the absence of litter results in a lack of focus on the anti-littering norm, while the presence of even only one piece of litter acts as a cue that focuses subjects on the norm that littering is bad and therefore reduces littering. They find evidence of this predicted effect in several experiments.[7]

Several studies in psychology and economics also predict and find a positive relationship between what others do and an individual's own actions, or an informational influence. In psychology, the classic experiments showing this type of influence involve observing how an individual's judgment of the length of a line segment varies depending on the responses of others (Asch, 1956; Deutsch & Gerard, 1955). Recent work in economics has predominantly demonstrated this relationship in public goods games (Bardsley & Sausgruber, 2005; Croson & Shang, 2005; Gaechter & Renner, 2003; Fischbacher, Gaechter, & Fehr, 2001; Falk et al., 2003), and social learning games (Celen, Kariv, & Schotter, 2007).[8]

Our experiment explores both the focusing and informational influences of norms in a non-repeated and non-strategic environment. To explore the focusing influence, we get subjects to think about what others are doing or about what others think one should do. To explore the informational influence, we allow subjects to observe the actions of strategically-unrelated other subjects.[9]

It is important to discuss precisely how our treatments provide evidence of the two kinds of effects. In our *focusing* treatments, which get subjects to think about what others do or what others think one should do, we explore the effects on behavior of focusing attention on norms, without any information about others' behavior. In our informational treatment, which provides subjects with information about what other people facing the same decision did, we explore the joint effects of focusing *and* the observation of others' behavior. That is, we compare subjects' behavior when they are unfocused and have no descriptive signal regarding others' behavior (the control and baseline conditions), to a situation where they are focused but do not observe others' behavior (pure focusing), and to a situation where they are focused and observe others' behavior (informational treatment).

Our results suggest that both influences operate on norm compliance. The *focusing* effect of norms, novel to economic research, leads subjects to exhibit greater norm compliance when their attention has been drawn to the norm. We find that subjects generally behave more pro-socially when asked to think about what others do, when asked to think about what others say one should do, and when shown what others actually do. The *informational* effect leads individuals to exhibit greater compliance with a norm when they observe greater numbers of others doing so. We find that the frequency of pro-social behavior is positively correlated with the observed pro-social behavior on the part of others. While this effect has been explored before in economics, we do so in a non-strategic and non-repeated environment that eliminates other possible motives for norm-compliance.

We employ a very simple non-strategic decision environment – a "binary dictator" game – in which subjects face a choice between a selfish action and a pro-social action (one that increases both equality and total payoffs). By eliminating strategic considerations, such as reciprocity, we test the direct effect of norms on behavior.[10]

2. Our experiment

We explore whether individual pro-social behavior is influenced by social norms, both through an informational influence and also through a focusing influence. It is important to separate these two effects since previous research suggests that they can influence behavior independently, and can even counteract one another. To this end we conduct an experiment in which subjects are faced with a binary choice in which they can either behave selfishly or pro-socially, in the latter case producing equity and maximizing social welfare.

To separately test the above two potential influences of norms, we conduct two kinds of treatments: *focusing* and *informational*. In the focusing treatments we ask subjects to think about what others do or what others say one should do in this decision, while in the informational treatment we show subjects what four others did when faced with the same decision.

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[7] They also predict and find that more unsightly or prominent litter-cues are more likely to produce focusing. Bateson, Nettle, and Roberts (2006) demonstrate a similar effect of cues (in this case they used pictures of eyes as the focusing cue) on contributions to an honesty box used to collect money in an office kitchen. They find that the presence of pictures with eyes on them increases the amount of money collected relative to a baseline.

[8] See also Banerjee (1992), Bernheim (1994), Knez and Camerer (1995), Cason and Mui (1998), and Celen and Kariv (2004).

[9] Of course, seeing what others do will likely also act as a cue that draws attention to the social norm, as in our focusing treatments. As a reviewer helpfully pointed out, our "informational" treatment really produces both focusing and information. An alternative name for our informational treatment might be "informational and focusing." However, given that we only provide subjects with information in this treatment, and no other focusing manipulation as in the other treatments, we decided to use the shorter label for this treatment in our experiment.

[10] Our experiment also eliminates an important confound in Cialdini et al.'s (1990) littering experiments, in which observing more litter in the environment means that one's litter is less harmful for the environment. In other words, it is possible that in Cialdini et al.'s experiments subjects may litter more when there is more litter simply because it is perceived as less socially costly and not because there is an informational influence.

We find evidence of both effects. Relative to a control, asking subjects what they think others do, what they believe others say one should do, or showing subjects what others actually do all produce more pro-social behavior, *even when subjects observe mostly selfish behavior or when most subjects believe that others behave selfishly*. We also find evidence of the informational effect: observing more people behaving pro-socially generally produces more pro-social behavior.

Previous experimental studies have used similar treatments to ours in which subjects are shown or are asked to think about what others have done. While the results of some of these studies are consistent with the informational and focusing effects we study – though none of these studies intends to explore the concept of focusing – they all confound a possible direct effect of norms with strategic considerations, resulting from the use of multi-player games. For instance, a few studies explore the effect of pre-play belief-elicitation on the behavior of subjects (e.g. Croson 2000; Dawes, McTavish, & Shaklee 1977).[11] However, these studies use games (such as a public goods game) in which any direct effect of norms on behavior is difficult to distinguish from indirect effects (for instance, through changed expectations of others' behavior, improved strategic thinking resulting from being asked about opponents' likely behavior, or expecting opponents to behave differently because they have been asked to think of one's own behavior).[12] Other studies have shown subjects about to play a game the behavior of previous players and find this to influence behavior (Berg, Dickhaut, & McCabe, 1995; Bohnet & Zeckhauser, 2004; Duffy & Feltovich, 1999; Moxnes & Van Der Heijden, 2003; Rege & Telle, 2004).[13] However, the fact that subjects play strategic games (public goods or ultimatum games), with opponents receiving similar information, makes it difficult to distinguish any direct effect of norms on behavior from possible effects due to changed expectations or strategic reasoning. In addition, several of these studies involve repeated play, which makes it even harder to infer the direct effect of observation on behavior, beyond any strategic influences.

Indeed, no previous economics experiment manipulates focusing and information regarding others' behavior in a one-shot non-strategic decision context. Our experiment, in which outcomes for a pair are determined only by one player and in which there is no repetition, allows us to evaluate the pure effect of our manipulations and therefore to address more precisely whether the change in behavior is the direct result of greater norm-compliance. Put differently, the use of a non-strategic experimental design, such as the binary dictator game we employ, allows us to test the direct effect of norms on behavior in the simplest possible environment in which a subject chooses between pro-social and selfish behavior.

2.1. Experimental design

We use a binary dictator game in which subjects choose between two options, each of which allocates money to the chooser and to a randomly assigned recipient. Table 1 presents the game as it was shown to subjects. The "pro-social" choice (X) gives $5 to both players, while the "selfish" choice (Y) gives $7 to the chooser and $1 to the recipient.[14]

Groups of 16–20 Carnegie Mellon and University of Pittsburgh students recruited from an e-mail list arrived at the experiment and received instructions (see Appendix 2). The instructions described the game and informed subjects that every participant would specify a choice. Subjects were told that, after they made their choices, they would be randomly matched with one other participant and assigned to the role of either player A (dictator) or player B (recipient) and that their choice would only count if they were player A.[15]

We conducted four treatments, with a total of 210 subjects. The treatments are described in Table 2. In each treatment, subjects made a choice between X (pro-social) and Y (self-interest) in the game in Table 1.

2.1.1. Baseline/control treatment

In the *baseline* and *control* conditions, subjects made a choice without any prior informational or focusing intervention. Subjects in the baseline condition (1 session, $n = 18$) were simply asked to choose between X and Y for the game depicted in Table 1. After making their choices they drew envelopes to determine roles and pairings. We then paid subjects privately one at a time.

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[11] Gaechter and Renner (2006) elicit beliefs and contribution decisions simultaneously from subjects playing a public goods game. They find that eliciting incentivised beliefs increases accuracy of the guess, does not affect the level and distribution of guesses (relative to a non-incentivized belief elicitation treatment) and that beliefs and contributions to the public good are significantly and positively correlated.

[12] A few studies in psychology use something like a focusing treatment in public good and prisoner's dilemma games (Liberman, Samuels, & Ross 2004; Pillutla & Chen 1999). Instead of using belief elicitation to focus social norms, these papers describe the game as either a non-economic ("social event") or economic ("investing fund") context. They find greater contributions in non-economic contexts and argue that this is because different contextual cues prime different norms. However, the strategic nature of the game makes it possible that the contextual influence on behavior is due to expectations about others' behavior (Rege & Telle 2004).

[13] Frey and Meier (2004), Shang and Croson (2006), Martin and Randal (2005) and Soetevent (2005) find similar results in field settings. A number of papers examine the effect of false feedback about what counterparts are doing in strategic contexts (Fleishman 1988; Messick et al. 1983; Poppe & Utens 1986; Schroeder, Jensen, Reed, Sullivan, & Schwab 1983).

[14] This asymmetry in the payoffs was introduced to make the "pro-social" choice (X) both fair (payoffs are equal) and efficient (the sum of payoffs is maximized). As such, fairness and efficiency norms select the same action.

[15] This was done by having each participant select a card that contained a number (1–10), specifying a match, and a letter (A or B), specifying a role within the match. It is possible that having subjects make choices prior to determining roles and matches might have influenced behavior. However, such an influence is constant between all our treatments. Since we are interested in changes in behavior based on – and between – our treatments, we chose this design to collect significantly more data.

Table 1
Payoffs in binary dictator game.

		Player A's earnings	Player B's earnings
Player A's choice	X	$5	$5
	Y	$7	$1

The control condition (1 session, $n = 20$) proceeded identically to the baseline condition, except that *after* making a choice between X and Y and finding out their role, subjects were asked to guess what percentages of previous subjects had chosen X and Y.[16] After making a choice, subjects were instructed to guess the percentages of subjects in previous sessions who chose X and Y. Prior to making their guess, subjects each received an envelope that contained the true percentages. They were told that after everyone made a guess and all sheets were collected, they could open the envelope and the experimenter would also read the true percentages aloud. Subjects were rewarded with a $5 bonus for making guesses within 3% points of the correct answer. Because the only difference between the baseline and control conditions is that control subjects made a guess *after* making a choice, we pool choices in the two conditions.

2.1.2. Focusing treatments

We conducted two focusing conditions, intended to test whether the focusing influence is the same when subjects think about the behavior of others as when they think directly about the norm.[17] The first treatment, *descriptive focus*, tests the effect that we discussed earlier in the paper: that thinking about the behavior of others focuses a subject on the norm of behaving pro-socially. Recall that, based on research on focusing and spreading activation, we predict that thinking about the actions of others will lead subjects to consider how appropriate such actions are, thus focusing them on the pro-social norm. Therefore, we expect pro-social behavior to increase when subjects are asked to consider the behavior of others. The second focusing treatment, *injunctive focus*, explores whether behavior differs from the descriptive focus condition if subjects are instead focused directly on the pro-social norm. This was done by asking subjects what they thought other people said one *should* do in such a decision context.

Subjects in the descriptive focus condition (2 sessions, $n = 34$) made the same choice and guess as subjects in the control, except that the order was reversed. *Prior* to making a choice of X or Y, subjects in the descriptive focus condition each received an envelope, which they were instructed not to open. They were told that this envelope contained the percentages of subjects in previous sessions that had chosen X and Y. They were told that these subjects had not made a guess prior to making a choice. Subjects then guessed the percentages of previous subjects who chose X and Y. After these guesses were recorded, they made their own choice between X and Y. Roles and matching were then determined in an identical manner to the control and baseline. At the end of the session, subjects were told to open the envelope that contained the correct percentages and these numbers were also read aloud by the experimenter. Subjects received $5 for guessing within 3% points of the correct values.

Subjects in the injunctive focus condition (1 session, $n = 18$) faced the same decision as above but, prior to making their own decision, guessed what percentages of subjects said that X and Y *should* be chosen. That is, prior to making a choice subjects guessed the percentages of subjects in a previous session that had stated X and Y should be chosen.[18] In all other respects (including the envelope and bonus for accuracy) the order and procedures were identical to the descriptive focus condition.

2.1.3. Informational treatment

In the informational condition subjects played the same game as in the other treatments. However, prior to playing the game each subject observed the choices made by four previous participants. Our discussion of previous work produced the main prediction of a positive relationship between the frequency of observed pro-social behavior and subjects' own pro-social behavior. However, since subjects' attention is being drawn to the behavior of others, as in the descriptive focusing treatment, we also anticipate an increased level of pro-social behavior (X) relative to the baseline, due to focusing on the pro-social norm.

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[16] These guesses were subsequently used in comparisons with the guesses in the Focus (descriptive) condition to determine whether guesses differ based on when they are elicited (either before or after subjects make choices).

[17] Spreading activation theory posits that norms that are more closely related to the norm of interest will increase the likelihood of norm compliance. Cialdini et al. (1990, Study 5) provide experimental evidence that compliance with a particular norm can be produced by focusing subjects on related norms, and that this effects is stronger for other norms that are more closely related to the social norm of interest. In our experiment, the injunctive focusing treatment focuses subjects directly on the pro-social norm of sharing, while the descriptive focusing treatment is likely to produce a similar effect on behavior only to the extent that thinking about what others do leads one to think about what they *should* do.

[18] At the end of one of the informational treatment sessions, we collected this information by asking subjects "What should one do in this situation?"

Table 2
Our treatments.

Treatment	Number of subjects	Step 1	Step 2
Baseline/control	38	Choice	(Guess)
Focus (descriptive)	34	Guess (*do*)	Choice
Focus (injunctive)	18	Guess (*should*)	Choice
Informational	120	Observe 4 choices	Choice

Before conducting the informational treatment, we photocopied the actual choice sheets completed by participants in the control condition and placed them inside envelopes, with the participant numbers written outside. We made eight such envelopes for each participant and placed them all inside a box.[19]

After receiving instructions regarding the game (see Appendix 2), subjects were told that prior to making a choice they would be able to observe the choices made by four participants in a previous session and that these participants had not observed the choices of previous subjects. Each subject then drew four envelopes (with different participant numbers) from the box and wrote down the four participant numbers and corresponding choices. Thus each subject observed a history of actual choices made by four different participants in the control treatment prior to making his or her own choice. After subjects recorded the observed choices, they proceeded to make their own choice of X or Y. They were then assigned to roles and matched in the same way as in the other treatments, and were paid privately before leaving the experiment.

2.2. Results

Table 3 and Fig. 1 present the main results. Table 3 presents, by condition, the average frequency with which subjects chose X, the pro-social action (third column).[20] The fourth column of Table 3 shows the average guessed frequency of X choices (control, baseline, and descriptive focusing treatments), the average guessed frequency of subjects stating X should be chosen (injunctive focusing), and the average observed frequency of X choices (informational). As the first two rows of Table 3 reveal, the difference in frequencies of X choices between the baseline and control treatments is negligible so we pool the two conditions in the third row.

Note first that the average guesses (of what percentage of others choose X) are very similar in both the control (41.5%) and descriptive focus (39.6%) conditions. These mean guesses do not differ significantly ($t_{51} = 0.21$), meaning that the guesses appear not to be influenced by whether they are elicited before or after subjects make a choice.[21] The average guesses are also close to the actual frequency of X choices in the baseline and control treatments (34%).[22] A comparison of the mean guesses with this actual frequency finds no statistically significant differences either for the control ($t_{19} = 0.92$) or descriptive focus ($t_{32} = 1.01$) treatments.[23]

In the baseline/control treatments, in which there is no focusing manipulation, a minority of subjects (34%) choose the pro-social action X. However, in all the other treatments, in which subjects' attention is drawn either to the actual or expected behavior of others or directly to the pro-social norm, the frequency of pro-social behavior is considerably higher. It is greatest in the two focus conditions (injunctive = 72%, descriptive = 67%), which do not differ significantly from each other ($\chi^2(1) = 0.17$), but do differ significantly from the baseline/control (descriptive focus: $\chi^2(1) = 7.44$, $p < 0.01$; injunctive focus: $\chi^2(1) = 7.10$, $p < 0.01$).[24] Thus, drawing subjects' attention to either the likely behavior of others or directly to the pro-social norm both appear to have very similar effects, supporting the prediction that having subjects think about the behavior of others focuses them on the pro-social norm.[25]

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[19] We varied the composition of envelopes inside the box slightly between sessions (by removing some participant numbers) to obtain variance in observation. For the first 3 sessions, we did not manipulate the number of X and Y choices. However, since this produced very few observations at the extremes, we decided to manipulate the weighting. In one session we did this by using two differently weighted boxes, which together contained the whole sample. In other sessions we did this by removing the choices of a few participants but using only one box. The instructions did not state that the box included all of the choices in a previous session, just that subjects would observe the actual choices of four previous participants.

[20] We mistakenly allowed one subject who had previously participated in the control condition to participate again in a descriptive focus session. We therefore exclude this subject from the analysis. Since subjects did not receive any feedback on what others in their session had done until the end of the experiment, we do not worry about this subject's choices contaminating the behavior of other participants.

[21] The cumulative frequencies of guesses for the control and focus treatments (depicted in Appendix 1) also indicate that the distributions of guesses were unaffected by treatment.

[22] Carpenter and Matthews (2005) also find that subjects are well calibrated about the behavior of others.

[23] The correlations between guesses and choices are positive in all conditions (ranging from 0.42 to 0.67).

[24] One implication of focusing is that even subjects who expect a low frequency of pro-social behavior are more likely to behave pro-socially when focused. This is indeed what we observe: in the descriptive focus treatment, even among those people that thought that less than 50% would choose X, 50% of subjects chose X themselves. This is higher than the overall frequency in the control/baseline (34%).

[25] Croson (2000) finds that belief elicitation leads to lower contribution rates in a linear public goods game and a prisoner's dilemma, while Gaechter and Renner (2006) find that (incentivised) belief elicitation increases contributions in a public goods game. As Gaechter and Renner discuss in their paper, the strategic decision setting with belief elicitation may lead to a decrease in contributions but it may also trigger reciprocal inclinations and lead to an increase in contributions. The main difference between these studies and the present study is that we use a non-strategic choice setting which does not confound a possible direct effect of norms with strategic considerations. We demonstrate that belief elicitation in the absence of strategic considerations leads to more pro-social behavior, and thus help shed light on how best to interpret these previous results.

Table 3
Comparison of behavior across treatments.

Treatment	N	Number choosing X (pro-social)	Mean guess/observation (std. dev.)
Baseline	18	6 (33%)	
Control	20	7 (35%)	Guess(do) = 41.5% (35.8)
Baseline/control combined	38	13 (34%)	Guess(do) = 41.5% (35.8)
Focus (descriptive)	33	22 (67%)	Guess(do) = 39.6% (30.4)
Focus (injunctive)	18	13 (72%)	Guess(should) = 57.8% (26.0)
Informational	120	65 (54%)	Observ. (actual) = 40.0% (28.1)
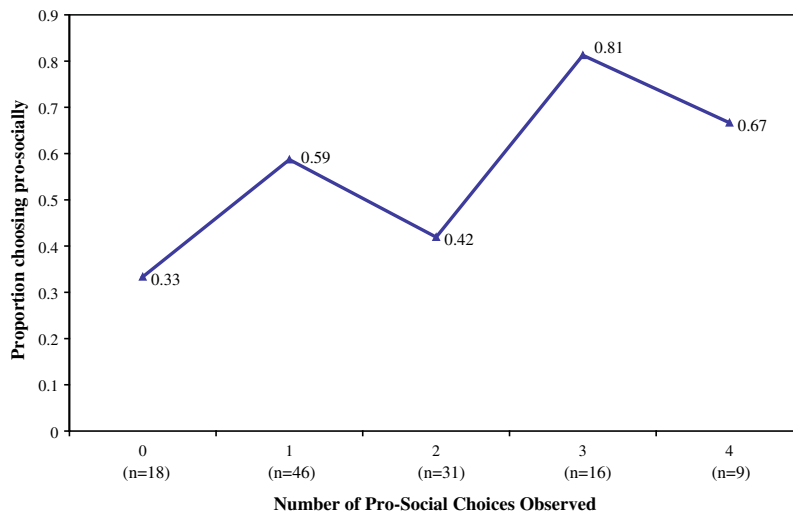
Fig. 1. Proportion of pro-social choices in informational treatment by observed behavior.

The overall proportion of X choices in the informational treatment (54%) is also higher than in the baseline/control treatments, and this difference is statistically significant ($\chi^2(1) = 4.60, p < 0.05$). This is in spite of the fact that, on average, subjects observed more Y choices (60%) than X choices (40%).

Fig. 1 presents the frequencies of X choices made by subjects in the informational treatment, by the proportion of previous X choices observed. For example, 18 subjects observed all selfish choices (zero pro-social choices), and of these 33% chose the pro-social action (X).

Generally, pro-social choices increase as subjects observe more pro-social behavior on the part of others. When subjects observed a majority of pro-social behavior on the part of others (either 3 or 4 X's), which occurred 25 times, they acted pro-socially 76% of the time (19 of 25), but when they observed mostly selfish behavior (0 or 1 X's) they acted pro-socially only 52% of the time (33 of 64).[26] Overall, there is generally a positive (or complementary) relationship between the behavior a subject observes and what that subject does.[27] A probit regression of subjects' choices on the proportion of X choices observed yields a positive, statistically-significant relationship (see Table 4).

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[26] One might expect the focusing influence to predict a difference between the proportions of pro-social choices made by baseline/control subjects (34%) and by subjects who observe zero pro-social choices in the informational treatment (33%). Note, however, that when subjects in the informational treatment observe zero pro-social choices they likely experience both a focusing influence (towards behaving more pro-socially) and an informational influence (towards behaving less pro-socially). We cannot predict *ex ante* which of the two opposing influences will be stronger. However, the results suggest that the effects of the two influences in the case of observing zero pro-social choices are comparable. A similar result appears in Cialdini et al's (1990) Study 2, in which both people who observed no litter (no focus and therefore implicitly no information) littered with almost the same frequency as those who observed two pieces of litter (focus with information that weakens the pro-social norm).

[27] It is worth noting that the relationship between what subjects observe others doing and what they themselves choose to do is not monotonic. To address this concern, we also estimated probit models that included binary variables for each of the possible proportions of X choices observed in the informational treatment. Observing either 1, 3, or 4 X choices results in statistically significantly more pro-social behavior than observing zero X choices or than in the baseline/control treatment. However, subjects who observed 50% X and Y choices by others do not behave significantly differently from subjects in the control/baseline or from those who observed zero X choices. One interpretation of this finding is that information that can be construed as "ambiguous" (where the proportion of X and Y choices are equal, thus providing a mixed signal about the norm's strength) produces a self-serving interpretation of others' behavior that reduces any effect of focusing on the pro-social response probability (see Babcock & Loewenstein 1997, Haisley and Weber, 2006). We also find that observing all X choices produces a slightly lower frequency of pro-social behavior than observing 3 X choices, but this difference is not statistically significant and can most likely be attributed to the low number of instances (9) in which subjects observed all X choices.

Table 4
Probit Regressions of choice by treatments and observed behavior.

Dependent variable: Choice ($X = 1$)	(1)	(2)
Descriptive focus (=1)	0.837 (0.308)***	0.837 (0.308)***
Injunctive focus (=1)	0.996 (0.378)***	0.996 (0.378)***
Informational (=1)	0.511 (0.239)**	0.184 (0.291)
Proportion of X Choices Observed		0.827 (0.422)**
Constant	−0.407 (0.210)*	−0.407 (0.210)*
Log-likelihood	−138.81	−136.85
N	209	209

Standard errors in parentheses.
* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

Note that subjects who observed more selfish than pro-social behavior still shared more frequently than subjects in the control/baseline treatment (52% vs. 34%, $\chi^2(1) = 2.9, p < 0.1$). That is, even subjects who observe most others acting selfishly behave more pro-socially than subjects who are unfocused on the behavior of others. This counters the intuitive notion that observing selfish behavior increases selfish behavior. However, this is consistent with the idea that observing even selfish behavior focuses subjects on the pro-social norm.

We can summarize our results as follows. First, focusing subjects on the behavior of others, by having them think about what others are likely to do, increases the frequency of pro-social behavior. Second, this change in behavior is comparable to the effect of focusing subjects directly on the pro-social norm (by asking them what they think others state one should do). Third, there is a complementary relationship between subjects' pro-social behavior and the amount of pro-social behavior observed from others. Finally, when people observe the behavior of others, this, on average, produces more pro-social behavior, even when the majority of others are behaving selfishly.

These results are demonstrated directly in Table 4, which presents probit regressions in which the dependent variable is whether a subject chose pro-socially ($X = 1$) or selfishly ($Y = 0$). The first regression demonstrates that all three treatments produce, on average, significantly higher proportions of X choices than the baseline/control, which is the omitted treatment. The second regression demonstrates the significant positive relationship, in the informational treatment, between what a subject observes others doing and a subjects' own behavior.

3. Conclusion

We report the results of an experiment testing the direct influence of social norms on behavior. Based on prior work in psychology, we test for two possible kinds of such influence.

First, we explore whether norm compliance exhibits a "focusing" effect, by which norms exert an influence on behavior only when they are primed with cues from the environment. In two focusing treatments, we find evidence of such an effect. Drawing subjects' attention to the likely behavior of others or to others' prescriptions for appropriate behavior both increase the frequency of pro-social behavior to very similar extents. Moreover, showing subjects the actual behavior of others, as in our informational treatment, produces an increase in pro-social behavior, even though most of these observed others behaved selfishly. Thus, all of our interventions appear to produce the focusing effect of norms, leading to increased pro-social behavior on average.

Second, we test for an "informational" influence of norms, whereby individuals are more likely to engage in pro-social behavior when they observe others doing so. Our informational treatment generally demonstrates such a complementary relationship, though it appears to be non-monotonic. While previous experiments suggest such a relationship, ours is the first to demonstrate it using a non-strategic one-shot decision context. This is important for carefully demonstrating that observation of others' behavior exerts a direct influence on behavior, absent strategic and payoff considerations.

Our experiment is also valuable in that it builds on recent work in social psychology, testing the precise ways in which norms influence behavior. We find that these influences appear to operate in an economic context involving personal vs. social tradeoffs that is familiar and of interest to economic researchers (see Camerer & Fehr, 2004).

Of course, our experiment is just a starting point for understanding how norms influence behavior. For instance, it is possible that other kinds of norms might operate in different ways – there may be norms upon which individuals are always focused or there may be norm-related behaviors that are uninfluenced by the behavior of others. Moreover, it might be interesting to explore the possibility that norm-compliance may "snowball" through iterated observation.[28]

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[28] For example, suppose that we observe people across several "informational" generations ($G_0, G_1, \ldots$) whereby every individual in generation G_t ($t > 0$) observes the behavior of four randomly-selected individuals from the previous generation G_{t-1}. If we assume that people in each generation respond to their observations in the same manner as subjects in our informational treatment (see Figure ure1), then a baseline (G_0) frequency of pro-social behavior of 34.2% (as in our baseline/control treatment) should be followed by 51.3% pro-social behavior in G_1 (which is close to the realized proportion of 54% in our experiment – they differ because of the imperfect sampling). We can further extrapolate to subsequent generations, who each observe a slightly more pro-social previous generation, producing higher rates of (expected) pro-social behavior (G_2: 57.5%; G_3: 60.0%).

It is also worth nothing that this research represents a first step with the ultimate goal of developing a theoretical model of norms that includes both the informational and focusing influences. Previous models account for behavior similar to the mimicry produced by the informational influence (Jones, 1984; Bernheim, 1994). However, one might also account for the focusing influence by introducing a state-dependent variable (influenced by environmental cues) that mediates the complementary relationship between one's action and what one observes others doing.

As our experiment reveals, there are ways in which norms influence behavior – often significantly and counter-intuitively – that merit further attention in economics.

Acknowledgements

Appendix 1

See Fig. A1.

Appendix 2A. Instructions to the experiments (control treatment)

This is an experiment in decision-making. Several research institutions have provided funds for this research. In addition to a $5 participation bonus, you will be paid the amount you accumulate during the experiment privately, in cash, at the conclusion of the experiment. The exact amount you receive will be determined during the experiment and will depend on your decisions and the decisions of others. If you have any questions during the experiment, please raise your hand and wait for an experimenter to come to you. Please do not talk, exclaim, or try to communicate with other participants during the experiment. Participants intentionally violating the rules may be asked to leave the experiment and will not be paid.

Please take an envelope from the experimenter.

Please open the envelope now. Each envelope contains a card with your participant number. Your participant number is private and should not be shared with anyone. Please do not lose the participant number as it will be used to determine how much money to give you at the end of the experiment and will be used throughout the experiment. This participant number will not be known to any other participant in the experiment.

This experiment will consist of a game between two people. For the game, each of you will be matched with one other anonymous person and one of you will be labeled Player A and the other will be labeled Player B.

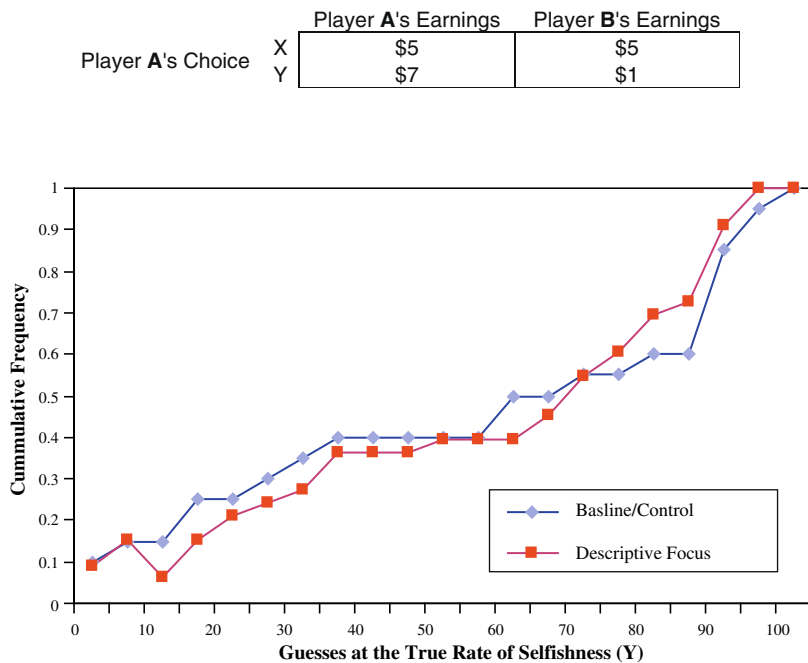The game is pictured below.

		Player **A**'s Earnings	Player **B**'s Earnings
Player **A**'s Choice	X	$5	$5
	Y	$7	$1

Fig. A1. Cumulative frequency of guesses for the control and focus treatments.

In this game, Player A will choose one of two options: *X* or *Y*. Both players will receive payments based on the choice of Player A. If Player A chooses *X* then Player A receives \$5 and Player B receives \$5. If Player A chooses *Y*, then Player A receives \$7 and Player B receives \$1.

Are there any questions about the game? If you have a question, please raise your hand and wait for an experimenter to come to you.

You should play this game as if you are person A. Once everyone has made a decision, half of you will be randomly picked to be Player A and the other half will be randomly picked to be Player B. Every Player A will be matched with one Player B, and that Player A's decision will determine the payoffs received by both people in the pair. This means that everyone is equally like to be a Player A, and if you are randomly picked to be a Player A your decisions will determine yours and one other person's payoffs. Therefore, you should make decisions as if you knew you were going to be a Player A.

Your role will be decided by a second set of envelopes that the experimenter will distribute later. These envelopes will contain a card with a letter (either A or B) and a number. The letter will determine whether you are person B or person A. The number will determine the person you are matched with. The matching is anonymous, so no one will every find out whom they played the game with.

Are there any questions before we proceed? If you have a question, please raise your hand and wait for an experimenter to come to you.

Choice sheet

Please indicate what choice you would like to make as Player A
Please indicate your choice (circle one):   X   Y

Matching sheet

Now the experimenter will come around with white envelopes for you to choose from. Please select **one** and record the information below. This will determine whether you are person A or person B in the game that you just played.

In the first space below, please first write the letter/number combination that was on the envelope you selected (e.g., A1, B2, etc.). Below that, please write your participant number (e.g., 1, 2, 3, etc.) in the space provided.

This will allow us to match you with another participant to determine everyone's earnings. Note that both your participant number and the letter/number combination that you drew are anonymous. No other subject will find out which numbers correspond to you.

Letter/number combination (e.g., A1, B2, etc.): _____
Participant number (e.g., 1, 2, 3, etc.) _____

What do you think others in a previous session of this experiment did?

The experimenter will now place a yellow envelope in front of each of you. Please do not open the yellow envelope until you are told to do so.

In previous experiments, different participants played exactly the same game that you have just played. In a moment, you will find out how many of those participants selected each of the two options. That is, you will find out precisely what percentage of previous participants selected *X* and what percentage selected *Y*. These percentages are written inside the yellow envelope you have in your possession. When you are done making your choices, and the experimenter has collected everyone's materials, you will be asked to open your envelope. The experimenter will also read the contents of the envelope out loud.

Before opening the yellow envelope we would like all of you to estimate what percentage of subjects chose each of the two options. In the space below, you should write what percentage of subjects you think chose *X* and what percentage you think chose *Y*. Please make sure your percentages add up to 100%. If your guesses are within 3% of the correct answer, then you will receive an additional \$5.

Percentage of subjects who chose: *X*: _____% *Y*: _____%

Appendix 2B. Instructions to the experiments (descriptive focus treatment)

This is an experiment in decision-making. Several research institutions have provided funds for this research. In addition to a \$5 participation bonus, you will be paid the amount you accumulate during the experiment privately, in cash, at the conclusion of the experiment. The exact amount you receive will be determined during the experiment and will depend on your decisions and the decisions of others. If you have any questions during the experiment, please raise your hand and wait for an experimenter to come to you. Please do not talk, exclaim, or try to communicate with other participants during the experiment. Participants intentionally violating the rules may be asked to leave the experiment and will not be paid.

Please take a white envelope from the experimenter.

Please also take a yellow envelope from the experimenter, <u>but do not open it until you are told to do so</u>.

Please open the **<u>white</u>** envelope now. Each envelope contains a card with your participant number. Your participant number is private and should not be shared with anyone. Please do not lose the participant number as it will be used to determine how much money to give you at the end of the experiment and will be used throughout the experiment. This participant number will not be known to any other participant in the experiment.

This experiment will consist of a game between two people. For the game, each of you will be matched with one other anonymous person and one of you will be labeled Player A and the other will be labeled Player B.

In previous experiments, different participants played exactly the same game that you are about to play. At the end of the experiment today, you will find out how many of those participants selected each of the two options. That is, at the end of the experiment, you will find out precisely what percentage of previous participants selected X and what percentage selected Y. These percentages are written inside the yellow envelope you have received and are holding. Before opening that yellow envelope, we will ask you to make a guess as to what percentage of people in previous experiments choose X and Y. If you are within 3% points, you will receive an additional $5 to whatever you make during the course of this experiment. At the end of the experiment, you will be able to open the envelope and see the percentage of people who choose X and Y.

The game pictured below is the one that you will play and the one about which you will be asked to guess the percentage of people who choose X and Y.

		Player **A**'s Earnings	Player **B**'s Earnings
Player **A**'s Choice	X	$5	$5
	Y	$7	$1

In this game, Player A will choose one of two options: X or Y. Both players will receive payments based on the choice of Player A. If Player A chooses X then Player A receives $5 and Player B receives $5. If Player A chooses Y, then Player A receives $7 and Player B receives $1.

Are there any questions about the game? If you have a question, please raise your hand and wait for an experimenter to come to you.

You should play this game as if you are person A. Once everyone has made a decision, half of you will be randomly picked to be Player A and the other half will be randomly picked to be Player B. Every Player A will be matched with one Player B, and that Player A's decision will determine the payoffs received by both people in the pair. This means that everyone is equally likely to be a Player A, and if you are randomly picked to be a Player A your decisions will determine yours and one other person's payoffs. Therefore, you should make decisions as if you knew you were going to be a Player A.

Your role will be decided by a second set of envelopes that the experimenter will distribute later. These envelopes will contain a card with a letter (either A or B) and a number. The letter will determine whether you are person B or person A. The number will determine the person you are matched with. The matching is anonymous, so no one will ever find out whom they played the game with.

What do you think others in a previous session of this experiment did?

In previous experiments, different participants played exactly the same game that you are about to play. In a moment, you will be able to find out how many of those participants selected each of the two options. That is, you will find out precisely what percentage of previous participants selected X and what percentage selected Y. These percentages are written inside the yellow envelope you have in your possession. Once all materials have been collected you may open the yellow envelope to see what others in previous experiments did. The experimenter will also read the proportion who choose X and Y out loud.

Before opening the yellow envelope, however, we would like all of you to estimate what percentage of subjects chose each of the two options. In the space below, you should write what percentage of subjects you think chose X and what percentage you think chose Y. Please make sure your percentages add up to 100%. If your guesses are within 3% of the correct answer, then you will receive an additional $5.

Percentage of subjects who chose: X: _____% Y: _____%

Appendix 2C. Instructions to the experiments (informational treatment)

This is an experiment in decision-making. Several research institutions have provided funds for this research. In addition to a $5 participation bonus, you will be paid the amount you accumulate during the experiment privately, in cash, at the conclusion of the experiment. The exact amount you receive will be determined during the experiment and will depend on your decisions and the decisions of others. If you have any questions during the experiment, please raise your hand and wait for an experimenter to come to you. Please do not talk, exclaim, or try to communicate with other participants during the experiment. Participants intentionally violating the rules may be asked to leave the experiment and will not be paid.

Please take an envelope from the experimenter.

Please open the envelope now. Each envelope contains a card with your participant number. Your participant number is private and should not be shared with anyone. Please do not lose the participant number as it will be used to determine how

much money to give you at the end of the experiment and will be used throughout the experiment. This participant number will not be known to any other participant in the experiment.

This experiment will consist of a game between two people. You will only play this game once. For the game, each of you will be matched with one other anonymous person and one of you will be labeled Player A and the other will be labeled Player B.

In previous experiments, different participants played exactly the same game that you are about to play. Before playing the game today, you will find out what four of those participants chose. That is, in a moment you will found out the precise choices made by four participants who were in the same position as you, but in a previous experiment. However, these four participants were not shown what anyone else had done. The experimenter is going to come around with a box from which you can select 4 yellow envelopes. Inside each envelope is the choice made by an actual participant in a previous session. When selecting, please make sure you only select 4 envelopes and be sure that they have different numbers on the outside labels.

The game that you will play, and the game that subjects in a previous experiment played, is pictured below.

		Player **A**'s Earnings	Player **B**'s Earnings
Player **A**'s Choice	X	$5	$5
	Y	$7	$1

In this game, Player A will choose one of two options: X or Y. Both players will receive payments based on the choice of Player A. If Player A chooses X then Player A receives $5 and Player B receives $5. If Player A chooses Y, then Player A receives $7 and Player B receives $1.

Are there any questions about the game? If you have a question, please raise your hand and wait for an experimenter to come to you.

You should play this game as if you are person A. Once everyone has made a decision, half of you will be randomly picked to be Player A and the other half will be randomly picked to be Player B. Every Player A will be matched with one Player B, and that Player A's decision will determine the payoffs received by both people in the pair. This means that everyone is equally likely to be a Player A, and if you are randomly picked to be a Player A your decisions will determine how much you, and one other person, will earn in this game. You should make decisions as if you knew you were going to be a Player A.

Your role will be decided by a second set of envelopes that the experimenter will distribute later. These envelopes will contain a card with a letter (either A or B) and a number. The letter will determine whether you are person A or person B. The number will determine the person you are matched with. The matching is anonymous, so no one will ever find out whom they played the game with.

Now that you have your 4 yellow envelopes, please open them and take a minute to read the 4 choices. Please record the numbers on the outside of the envelopes.

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