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Motivational Cherry Picking

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Abstract

We construct a simple three person trust game with one trustor and two trustees. The trustor has the possibility to either trust both trustees or none, while the trustees make their decisions either sequentially or simultaneously, depending on the treatment. When trustees play sequentially, follower trustees who are informed about the leader's choice are significantly more selfish than in the simultaneous move treatment, independent of the leader's choice. Leaders do not behave significantly different than in the baseline treatment. Follower trustees cherry pick the motivation that materially serves them best. When the leader trustee plays selfish, they tend to conform. When the leader makes a pro-social choice, followers seem to perceive the duty as already fulfilled by the leader. While guilt works well as a motivational force in a dyadic situation, it gets alleviated easily when the situation allows a shifting of responsibility.

JEL codes: D03, D71, C79, C92

Keywords: Team production, Trust, Choice architecture, Guilt aversion, Conformity, False consensus effect, Lab experiment, Cherry picking

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1 Introduction

Much of the economic literature on pro-social behavior evolved around the identification of different preferences and the definition of behavioral types (Englmaier and Wambach, 2010; Dur and Sol, 2010; Huck et al., 2010; Rey-Biel, 2008, for recent examples see) An important assumption over behavioral types for the design of optimal type dependent policies or contracts is their stability over a wide range of situations. This must be especially true for changes in the environment that do not alter the payoff fundamentals but only the information over the action of others. Consider the following example: A principal hires two agents who shall complete a task independently of each other and it is not verifiable by the principal whether the agents actually performed the task or not. Does knowledge of one agent over the behavior of the other agent change her behavior, and if so, why?

This paper identifies the phenomenon of cherry picking among different motivations such that the chosen motivation justifies seflish behavior. For this purpose we model a parsimonious three person trust game with one trustor who can either trust two trustees simultaneously or trust none. The two trustees subsequently and independently decide whether to reciprocate the trust. We experimentally vary the information set of the *second* trustee: in the *Baseline Treatment* the trustees decide simultaneously, while in the *Leader-Follower Treatment* the leader trustee takes the decision first and the follower trustee is informed about that decision before she makes hers. None of the trustees' decisions have a financial impact on the other trustee. In a further treatment (*Strategy Method Treatment)*, the follower took her choices conditioning on the leader's choice using the strategy method. While the simultaneous choice treatment does not allow motivational cherry picking conditional on the other's choice, the latter two treatments do. However, the Leader-Follower Treatment facilitates motivational cherry picking as it does not require the subjects to evaluate their potential choice at the subgame that was not reached, while the Strategy Method Treatment does and makes it therefore harder to behave according to two different motivations as this would create an internal inconsistency.

This design allows us to evaluate the predictive power of three theoretical approaches used to explain non-selfish behavior in similar situations and compare them to our "motivational cherry picking" argument: (a) outcome-based models as Fehr and Schmidt (1999)[1] or Bolton and Ockenfels (2000) do not predict different results in our three person trust game when the information set is varied. information about the leader trustee's choice affects the follower trustee via (b) guilt aversion in the Battigalli and Dufwenberg (2007) model of guilt aversion in two ways. *Simple guilt* is felt when one believes he disappoints someone else. *Guilt from blame* adds a psychological cost for intentionally disappointing someone. We use the latter one in order to extend guilt aversion from an individual (1 trustee) to a group (2 or more trustees) level. Knowing that the leader already returned trust may reduce responsibility

[1] In a recent paper Blanco et al. (2011) evaluate the predictive power of the Fehr and Schmidt (1999) model in a within subject design over several games.

attribution, crowding out the feeling of guilt. Less other-regarding behavior of the follower trustee may result. As a consequence the follower trustee does not return the trust, while he may well have been motivated to behave pro-socially in a dyadic setting. Hence, *collective guilt aversion* would predict an effect of the information structure, in particular less other-regarding behavior of followers when leaders already played pro-social, and more other-regarding behavior of followers when leaders already played selfish. The information structure matters as well when (c) *conformity* is considered as a motivation. Conformity models (see Akerlof (1980), Bernheim (1994), Manski (2000), or Sliwka (2007)) take social interactions into account and would predict that follower trustees use the choice of their leader trustee as a guideline for appropriate behavior. That is, followers would tend to play pro-social (selfish) when their leader also played pro-social (selfish).

The (d) motivational cherry picking argument now assumes selfishly myopic agents who evaluate their choice only on the part of the game that has been reached and do not evaluate their strategy before the game. In the case the leader chooses the selfish agent the use a conformity argument in order to play selfish while when the leader chooses the non-selfish action they argue in a collective guilt sense. This results in less pro-social behavior of the follower than in the case when decisions are taken simultaneously.

This game is important in various economic interactions. For example, working together in teams often implies that actions to complete a task are taken sequentially. One person takes – or is assigned – the role of the leader, while another person is following, knowing about the action of the leader. When a principal contracts a team, the information flow within the team is of importance especially when the information facilitates subjects to justify selfish behavior. Early contributions on the organization of teams by Radner and Marschak (1972) and Hermalin (1998) were concerned about information structures and incentives within teams. Hermalin (1998) showed that when a leader has more information about the effectiveness of the contribution to a project, the leader can credibly convince the follower by sacrificing own payoff. However, this work in the tradition of expected utility maximization neglected how people resolve moral dilemmas depending on the information about other team members' choices. What happens when the information asymmetry on the effectiveness of the contribution is not severe and the incentives of the follower are independent of the objectives of the leader? Does having a leader setting a positive example through effort provision crowd out effort by followers? Or on the contrary, does the failure of a leader crowd in effort provision by the follower?[2]

In the *baseline treatment* around 30% of the trustees reciprocate and we find a significant correlation between second order beliefs and choices. However, we observe substantial differences in behavior in the *leader-follower treatment*. While leaders do not behave differently than in the baseline case, followers

[2]Some evidence of the influence of leaders can be observed in leadership giving in public good and fund-raising games provide some indication: Subjects increase contributions, when leaders did so before in public good games where the interests of the leader and the followers are aligned – Potters et al. (2007) or Güth et al. (2007) – and even when the interests are independent of each other as in a charitable giving experiments (Reinstein and Riener, 2012, see for example).

reciprocate significantly less often. Furthermore, we find that the basic mechanisms of guilt aversion (second order beliefs and the sensitivity to guilt) are important determinants of pro-social behavior. Followers appear to cherry pick from the two motivations (either conformity or collective guilt) that explain the treatment difference. When the leader trustee has made a selfish choice, there is a strong tendency to conform, that is, play selfish as well. When the leader made a pro-social choice, followers seem to perceive the duty of reciprocating to the trustor as already fulfilled by the leader and play selfish. This behavioral pattern – a self-serving bias – is known from other studies, see Konow (2005) for an overview. It can be regarded as an application of the theory of cognitive dissonance of Festinger (1957). While dissonance results as a consequence of actual behavior deviating from one's standard of behavior, it can be resolved/reduced via self-serving beliefs about the appropriate behavioral standard. In the *leader-follower treatment* followers respond to the choice of the leader which essentially facilitates self-deception. Followers only have to form a belief about the appropriate behavioral standard/motivation (conformity, collective guilt) in a self-serving fashion. This argument is supported by the findings of the strategy method treatment, where subjects behaved like subjects in the baseline treatment.

Our work is related to recent studies in the economics literature on experimental labor market settings. Whether a pro-social decision of a subject is reciprocated depends on who actually makes the decision. Charness (2000) shows that it matters for subjects if a human takes a deliberate choice of being pro-social or a random device determines the outcome. Agents reciprocate to pro-social wage offers by working harder only when they were made by a human principal. A formalization of this idea has been recently brought forward by Sebald (2010). However, it is hardly known, yet more relevant for personal relations, how responsibility can be shifted to another person[3], therefore undermining feelings of guilt and its behavioral consequences. This is the context our experimental setup addresses as the decision of a human principal affects two other human subjects who decide to return trust or not either simultaneously or sequentially, a situation very common in team work. Our study also relates to recent work that examines three player interactions.[4] Cassar and Rigdon (2011) analyze a trust game with one trustor and two trustees and two trustors and one trustee. They find higher trustworthiness in the one trustor case and higher trustworthiness in the two trustor case. Furthermore, in a series of papers, Thöni and Gächter (2010), Gächter and Thöni (2012), and Gächter et al. (Forthcoming) explore peer effects in trilateral gift exchange labor market experiments where they let the employer alter the wages of each of their two employees independently. Our study is complementary to these approaches as we consider a game where a trustor/principal does not have the possibility to discriminate between the trustees/agents. This situation is common especially when hiring and organizing work teams.

These findings also contribute to the discussion of differences in the hot (direct response) versus cold

[3]Bartling and Fischbacher (2010) study responsibility shifting among principals in a dictator game variant showing that responsibility can be shifted from the person actually taking a selfish decision to the messenger of this decision.

[4]Although Knez and Camerer (1995) already 15 years ago argued that it is necessary to study games where three players interact, only in very recent years, research in this direction was conducted.

(strategy method) elicitation of behavior. Recent work by Casari and Cason (2009) or Brosig et al. (2003) showed that there may be differences in trust and trustworthiness applying these two methods.[5] We find that the strategy method delivers different results, when the decision situation allows for a multiplicity of norms to be applied. In our context, cherry picking in the strategy method requires to enter two seemingly inconsistent decisions in subsequent screens which may be individually costly for the follower subjects. In the direct response method followers can adhere to cherry picking in a much easier way as only one decision is requested and they do not have to ponder about the other choice and the resulting inconsistencies.

Finally, our results connect to the literature on the relationship between beliefs and behavior. Dufwenberg and Gneezy (2000) is an early contribution on the correlation of second order beliefs and behavior in a trust game. A recent paper by Fischbacher and Gächter (2010) also shows how beliefs are related to the dynamics of free riding in public goods experiments. Models of guilt aversion, see for instance Charness and Dufwenberg (2006), take these beliefs as a primal force that drives the behavior of subjects in this case, with the rationale that if I do not act upon these beliefs I am knowingly letting the trustor down which imposes a psychological cost on me which depends on my sensitivity to guilt. In contrast to the previously mentioned experiments Ellingsen et al. (2010) elicit first order beliefs of recipients or trustors in dictator and trust games and reveal those first order beliefs to dictators and trustees to examine their reactions. They do not find any correlation between the revealed first order beliefs and actions and conclude that the observed correlation in other studies is due to a false consensus effect. We approach this question of causality of stated beliefs on behavior in an innovative way. We elicit first- and second order action beliefs in an incentivized fashion and control for a potential consensus effect, interpreted as omitted variables bias (OVB) in a regression framework.[6] Our results reduce the coefficient on the second order beliefs in the range of Bellemare et al. (2011), indicating that consensus effects do play a role, but are not the only explanation for the correlation between second order beliefs and behavior. We also tackle the problem of potential correlations with guilt sensitivity and second order beliefs – another source of confound as described in Bellemare et al. (2011) – by directly measuring guilt sensitivity using a psychological measure – the Test of Self-Conscious Affect-3 (TOSCA-3) by Tangney et al. (1989) – a widely used way to elicit sensitivities to guilt and shame.

The remainder of the paper is organized as follows. In section 2 we discuss relevant theoretical approaches and derive behavioral predictions. In section 3 we describe the experimental design. Results are presented in section 4 and section 5 concludes.

[5] See Brandts and Charness (2009) for a recent review.

[6] That the false consensus effect can indeed be viewed as an omitted variables problem in a regression framework is easy to see: the omitted variable (subject's belief over the state of the world and how one should behave) has indeed an influence on her behavior and it influences the view over how other subjects expect themselves to behave (the second order belief), so the conditions for the presence of a OVB are met. Controlling for this reduces the OVB. See for example Greene (1993) for a discussion of the OVB.

2 A formal model and hypotheses

One trustor, we will call her A, can either choose a safe option or trust both trustees (call them $B1$ and $B2$) to invest in a, only for her, risky project.[7] Investing in the risky project has a material cost for the trustees, but bears no risk for them. This means, each of the trustees has then the possibility to reciprocate. The game is presented in Figure 1. The games we investigate experimentally differ on the information set of the second trustee's decision nodes: In the first game B2 does not know how B1 decided, while in the second game $B2$ knows the decision of $B1$. The game theoretic solution of both games (considering only material payoffs / selfish preferences) is the same and can be derived via backward induction. A will choose the safe option, while neither $B1$ nor $B2$ will choose the risky project.

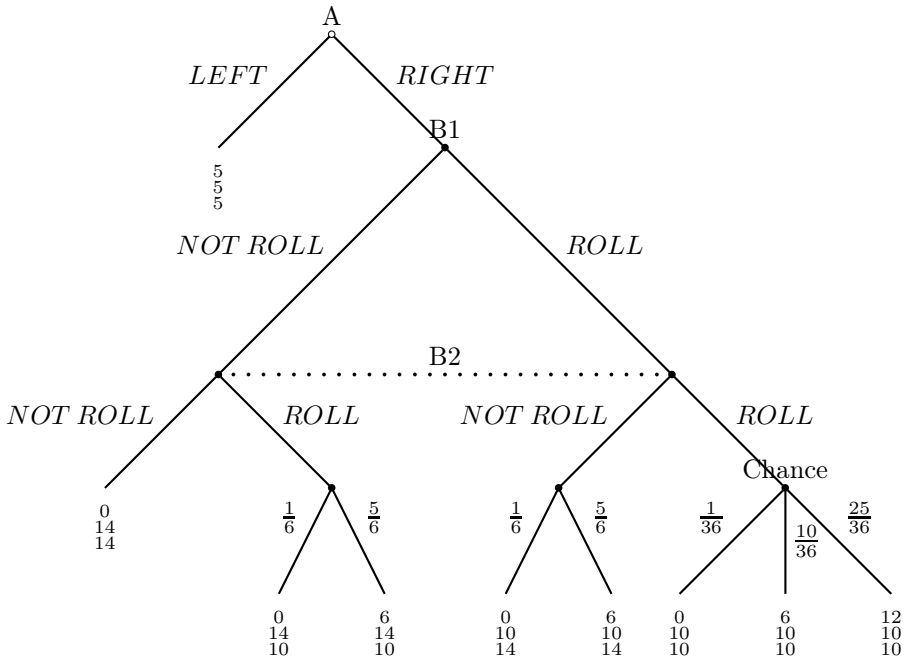

Figure 1: Simultaneous move game – monetary payoffs

However, numerous previous experiments have shown that this theoretical result does not give accurate predictions of observed behavior. Hence, we consider three possible alternative explanations for other-regarding behavior that can be relevant within the given context: i) fairness or inequity aversion (see outcome-based models of Fehr and Schmidt (1999) or Bolton and Ockenfels (2000)), ii) guilt aversion (see the models of simple guilt and guilt from blame in Battigalli and Dufwenberg (2007) and iii) conformity models (Akerlof, 1980; Bernheim, 1994; Manski, 2000; Sliwka, 2007, see) that consider the social interaction between leader and follower. The predictions from a model of inequity aversion (as well as

[7] The structure of the game is inspired by a mini trust game also used by Charness and Dufwenberg (2006).

those from models of purely selfish behavior) do not depend on the sequence and information structure of the decisions of the trustees. Also simple guilt does not predict a treatment difference. Nevertheless, we use simple guilt in order to illustrate the basic mechanism of guilt aversion. Then, we extend guilt aversion to a group level. Applying guilt from blame takes into account that the follower trustee is informed about the leader's behavior. Such collective guilt predicts an effect of varying the information set (the follower trustee would do the opposite of the leader) as well as conformity models (they would predict that the conforming peer effect leads to a positive correlation between leader and follower behavior).

2.1 Fairness

We compare the inequality motive between the trustor and the trustee. The utility of the subject depends on the expected payoff inequality. This is a straightforward extension of the model by Fehr and Schmidt (1999). We simplify the model and replace the chance move with the expected outcomes as in this case subjects care only about their expected outcome.

We will assess the game using the utility function introduced in Fehr and Schmidt (1999) under the assumption that inequality in favor is easier to tolerate than adverse inequality. Under this assumption neither in the baseline game, nor in the leader follower game the subjects would engage in the risky project, because the inequality decrease of an investment is too costly to compensate for the losses.[8] Moreover, in both treatments $B1$ and $B2$ should behave the same in the same proportions, as the utility calculus they apply is the same for both in equilibrium.

Hypothesis 1. *Leader and follower trustees choose to ROLL at the same rate as trustees in the baseline treatment.*

2.2 Simple Guilt Aversion

Simple guilt's basic rationale is the following: The more I believe you were disappointed, the more guilt I would anticipate to feel. Hence, the more likely I am to take the pro-social choice to avoid the negative feeling that would result from the selfish choice. Incorporating B's psychological cost of letting down A into the utility function requires to use beliefs about beliefs. We denote τ_A^B as A's initial belief about the probability that B chooses ROLL, and τ_B^{AB} as B's interim (conditional on A choosing RIGHT) belief regarding τ_A^B. In order to measure the amount $B1$ thinks he hurts A by his action (choosing NOT ROLL), we calculate the difference between A's expected payoff when $B1$ plays ROLL (weighted by the second-order belief τ_{B1}^{AB1}) and when he plays NOT ROLL: $5 \cdot \tau_{B1}^{AB1} - 0$

How much this actually affects $B1$ is expressed by taking his sensitivity to guilt γ_{B1} into account. Hence, if $B1$ selects NOT ROLL, he therefore experiences expected guilt of $5 \cdot \tau_{B1}^{AB1} \cdot \gamma_{B1}$. This psychological cost of guilt reduces $B1$'s material payoff of choosing NOT ROLL. Given $B1$ is rational she will prefer

[8] Derivations of the model can be found in the appendix.

ROLL over NOT ROLL if the following inequity holds (note that $\gamma_{B1} = 0$ represents the model's special case of pure self-interest, when subjects are not affected at all by feelings of guilt):

$$U_{B1}^{NOTROLL} = 14 - \gamma_{B1} \cdot 5 \cdot \tau_{B1}^{AB} \quad < \quad 10 = U_{B1}^{ROLL} \tag{1}$$

This leads to hypotheses 2 and 3 which are about the two input variables of the guilt aversion model, second-order beliefs and the sensitivity to experience guilt.

Hypothesis 2. *The higher B's second-order belief τ_{B1}^{AB1} is, the higher is the probability that B1 will choose ROLL.*

Hypothesis 3. *The higher B's sensitivity to guilt γ_{B1} is, the higher is the probability that B1 will choose ROLL.*

Finally, based on expression 1 we suspect a positive interaction effect between the second-order beliefs and the sensitivity to guilt.

Hypothesis 4. *There is a positive interaction between B's sensitivity to guilt γ_{B1} and B's second-order belief τ_{B1}^{AB1}.*

2.3 Collective Guilt Aversion

In order to extend guilt aversion from an individual (1 trustee) to a group (2 or more trustees) level we will now consider guilt from blame as a motivating force for pro-social behavior in this environment. While simple guilt is modeled as the psychological cost of disappointing someone, guilt from blame – the second guilt aversion model in Battigalli and Dufwenberg (2007) – adds a psychological cost for *intentionally* disappointing someone. The guilt from blame one experiences depends on how much one is blamed by someone else for being willing to disappoint this person. So far guilt from blame has been applied in dyadic games, see, for instance, Charness and Dufwenberg (2011). Considering the blame from intentionally disappointing the trustor predicts differences in behavior when the ex post information structure is varied. The focus of our application shifts to a group context (one trustor, two trustees), but the core mechanism of the model remains exactly the same. While it is (less/more) blame from intentionally disappointing that drives behavior in the group situation, it may be more intuitive to speak about responsibility that one shifts away or takes up. In the context of our game guilt from blame means that both Bs consider how much A blames them for intentionally causing A's unexpectedly low payoff. In order to incorporate B's psychological cost of being blamed by A it is essential to express the extent B intended to disappoint A, and B's belief about A's ex post belief about B's intention to disappoint.

Generally, A can only use her payoff to form her ex post belief about B's intention to disappoint. While being informed or not about the choice of $B1$ does not affect simple guilt, it becomes relevant for guilt from blame. Depending on the choice of $B1$ certain outcomes are not possible anymore and $B2$ can

use this information. Hence, in the *leader follower* treatment, as $B2$ is informed about $B1$'s choice, $B2$ is able to update his beliefs. Essentially, in case $B1$ already decided to ROLL $B2$ knows that he is less likely to get blamed by A if he does NOT ROLL, while in case $B1$ did NOT ROLL $B2$ knows that he is more likely to get blamed by A if he does NOT ROLL. See appendix B.2 for details.

If we consider guilt on a group level – via the model of guilt-from-blame – as a motivation, a pro-social choice of the leader trustee leads to selfish behavior of the follower trustee. Guilt-averse trustees who would play pro-socially in a 2 person setting (to avoid feeling guilty from disappointing the trustor) may now take the opportunistic choice, if they are informed that the trustor already received something from the leader trustee. The feeling of guilt is crowded out. Hence, if responsibility can be shifted to the leader, guilt is alleviated, and as a consequence the follower trustee takes the selfish choice.

Hypothesis 5. *Followers choose NOT ROLL more often, if their leader has chosen ROLL.*

In contrast, knowing that the other trustee already played selfish increases responsibility attribution.

Hypothesis 6. *Followers choose ROLL more often, if their leader has chosen NOT ROLL.*

2.4 Conformity

In neoclassical economic theory only market interactions are of interest, social interactions are not considered. This lack of realism has been addressed, among others, by Akerlof (1980), Bernheim (1994), or Sliwka (2007) who developed models of social interaction. Manski (2000) discusses various ways how the actions chosen by other agents affect our own decisions, for instance, at the preference level. Gaining status or social-esteem is then achieved by conforming to the observed action of the peer. In our context, followers would take the action of the leader as a signal for the social norm in the situation they are in as well. There is evidence for conforming behavior in the lab as well as in the field. Güth et al. (2007) as well as Bardsley and Sausgruber (2005) find support in the context of public goods experiments. Leading by example – letting one group member contribute to the public good before followers do – increases contributions in comparison to the standard voluntary contribution mechanism. Shang and Croson (2009) analyzed how information about a typical contribution to a radio station affects contribution rates. They found that the highest reference amount ($300) leads to a significantly higher contribution than giving no information about a typical contribution at all.

In our context, the decision of the two agents to exploit the principal or not constitutes a moral dilemma and is therefore different from a public goods game setting (a social dilemma). Yet, the basic mechanism is the same. Followers are told what someone else in the same position did. Hence, it should be interesting to see, whether the knowledge about the leader's choice has a similar effect on the follower's action. Since the leader's signal can be selfish or pro-social behavior we distinguish between these two cases.

Hypothesis 7. *Followers choose NOT ROLL more often, if their leader has done so.*

Hypothesis 8. *Followers choose ROLL more often, if their leader has done so.*

3 Experiment

3.1 Design

Subjects played the game three rounds with perfect stranger matching. In the baseline treatment, the trustor and the trustees made the decisions simultaneously. The trustees' choices only mattered, when the trustor chose to trust and subjects were explicitly told about this. Then we elicited the first order beliefs of the trustor on trustees behavior and the first order beliefs of the respective other trustee.[9] Then we asked for the second order beliefs of the trustees on trustors' expectations. In the leader follower treatment, the order was the same, except that the leader trustee made the decision before the follower trustee and the decision was reported to the follower trustee *before* she made a decision.

Table 1 summarizes the experimental procedure. Second order beliefs were elicited *after* the decisions were made in order to avoid that subjects think too much about this before and to allow for self justification, which works against our hypothesis that subjects shift guilt, which makes our results on beliefs even more conservative. We deliberately refrained from introducing the possibility to communicate as we believe that communication not only shifts the beliefs but can also trigger other forms of behavioral motivations: it creates a form of identity which can shape behavior as has recently been shown in economic experiments by Chen and Li (2009) or Hargreaves-Heap and Zizzo (2009) or subjects keep their (verbal) promises because they are averse to lying and not to guilt (Vanberg, 2008b, for experimental evidence in this class of games see).

In the post-experimental questionnaire we assessed subjects' general dispositions with respect to guilt and shame using the Test of Self-Conscious Affect-3 (TOSCA-3) by Tangney et al. (1989), arguably the most widely used way to elicit sensitivities to guilt and shame. It consists of 16 everyday-life scenarios in which something went wrong. For each situation subjects are presented a list of possible reactions (among them a shame- and a guilt reaction) and for each they are asked to rate how likely they are to react in that way. The TOSCA-3 relies on the self-behavior distinction between shame and guilt. Guilt responses are characterized by regret and negative behavior-evaluations (thinking "I made a mistake", for example), as well as repair action tendencies (like apologizing). Shame responses are characterized by negative self-evaluations (thinking "I am a terrible person") and withdrawal action tendencies (e.g., hiding).

[9] We elicited the distribution of the beliefs using quadratic scoring rule (Schotter and Sopher, 2007, see). The intuition of the quadratic scoring rule was explained to the subjects and they were able to practice. The exact formula was available upon request.

Stage	Treatment		
	Baseline	**Leader-Follower**	**Strategy method**
Observations	124	58	30
I		Decision Trustor Decision Leader Trustee	
II	Decision both Trustees	FO bel. over leader Decision Follower Trustee	Decision both Trustees
III		First Order Beliefs	
IV		Second order beliefs	
V		Risk aversion assessment	
VI		Questionnaire with guilt sensitivity measures	

Table 1: Experimental design

A – well validated – index constructed from responses provides us with a measure of the disposition to guilt of the subjects – which is the empirical correspondent to the guilt aversion parameter γ. The TOSCA-3 also provides us with measures for the sensitivity to shame and pride.

3.2 Procedure

We ran 10 separate sessions for the three treatments. 212 participants were recruited among students from various disciplines at the local university using the ORSEE software Greiner (2004). The experiment was programmed and conducted with the software z-Tree Fischbacher (2007). Subjects were seated separately and received written instructions (see Appendix C for translated materials). After answering questions privately, participants had to answer a few control questions. The experiment started when all participants had answered all control questions correctly. The sessions took on average 90 minutes, including reading the instructions, answering control questions and payment. Average earnings were Euro 12.76 with minimum Euro 7.00 and maximum Euro 16.60, including a Euro 2.50 show-up fee.

4 Results

In the following we analyze results of the experiment and discuss them in the light of the possible motivations presented in section 2 (fairness concerns, guilt aversion, and conformity).

4.1 Trustee behavior

Result 1 Follower trustees ROLL less often than baseline trustees.

Figure 2 illustrates that follower trustees in the leader follower treatment roll the dice significantly less often than trustees in the baseline treatment (ranksum test, t-test: p=0.02). They also roll significantly less often than leader trustees (ranksum test, t-test: p-value=0.10). A finding that partially contradicts hypothesis 1, as we do not find a significant difference in the leaders' behavior and the behavior of the baseline subjects (ranksum test, t-test: p-value=0.58). It is crucial to see that this behavior does not seem to be mediated by a change in the second order belief of the follower trustee compared to the leader trustee. Follower trustees have no diverging second order beliefs from leader trustees (ranksum test, p-value: 0.51, t-test, p-value: 0.57) and the average second order belief of all trustees lies at around 35%. So if followers experienced guilt concerning their own action, they would choose equally often to roll than in the baseline treatment. This seems to suggest that feelings of guilt are crowded out due to favorable behavior of the leader, even though followers hold – in an average sense – the same beliefs as the leaders (followers' belief that they should go right is 34% while leaders' belief is 37%, this difference is not significant, ranksum-test, p-value: 0.507).

Result 2 Cherry picking: Follower trustees conform with the leader's choice only when it is to their advantage.

Does the decision of the leader trustee have a conforming effect on the choice of the follower? Table 2 shows the decision of trustees distinguishing between baseline trustees, and follower trustees conditional on their leader's decision. If the leader trustee chose not to roll, 36 out of 43 or 83.72% followers also chose not to roll. Compared to the baseline treatment (87 out of 124 or 70.16%), follower behavior after the leader chose not to roll is less pro-social (Wilcoxon ranksum test, p-value: 0.051). It appears that conformity is a relevant motivation if to conform means a material advantage for oneself, supporting hypothesis 7. If the leader trustee chose to roll, 14 out of 15 or 93.33% followers chose not to roll. Follower behavior after the leader chose to roll is clearly not conforming to the leader trustee's choice, in contrast to hypothesis 8 and even less pro-social than in the baseline (Wilcoxon ranksum test, p-value: 0.045). When conforming implies a material disadvantage it seems that trustees do not care about following the leader's choice. Instead, we find that followers reciprocate less often (6%) if the leader did reciprocate.

Given those results, we tested whether the cherry picking behavior of followers can be replicated when the followers' decision is asked in a strategy method design (Selten, 1967). Follower subjects were not informed about the leader's choice before they had to choose. Instead, they had to make two decisions, one in case the leader had played pro-socially, one assuming the leader did not. From a game-theoretic perspective this difference in the elicitation method should not make a difference. Table 3 clearly shows that most of the subjects make their choice not dependent on the leader's choice. Furthermore, this results in a distribution of choices given the leader went NOT ROLL (73.33%) / ROLL (70%) that is

Figure 2: Trustee chooses to "ROLL"

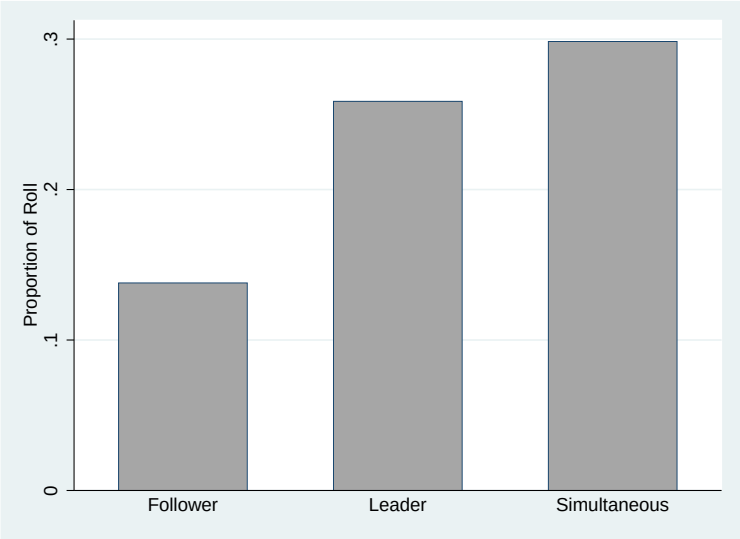

Table 2: Comparison of decision to reciprocate (ROLL) in Baseline vs Leader Follower Treatment

	All	Follower's decision	
	Baseline	Leader left	Leader right
Left	70.16%	83.72%	93.33%
	(87)	(36)	(14)
Right	29.84%	16.28%	6.67%
	(37)	(7)	(1)
p-values	*Baseline vs. Leader left*		*Baseline vs. Leader right*
χ^2 test	0.05		0.05
Fisher's exact test	0.06		0.07
One sided Fisher's exact test	0.04		0.03
Number of observations in parenthesis.			

Note: This table reports the percentage of subjects who reciprocated. The first column shows the results for the baseline treatment, when decisions were made simultaneously. Columns two and three report the followers' decision, depending on the decision of the leader. The test statistics compare the baseline treatment to the followers' decisions conditioning on the leaders' decision.

nearly identical to the distribution of the baseline simultaneous move game (70.16%). Interestingly, when choices are elicited with the strategy method, the strong direct response results disappear. The strategy method is a widely used tool in experimental economics and in previous comparisons only little differences in choices have been reported.[10] However, Brosig et al. (2003) find a significant hot (direct response) versus cold (strategy method) effect in a bargaining game with a punishment option. We find that the strategy method delivers different results, when the options cannot easily be ranked in a linear way, as for instance the trustee's response to increasing transfers of the trustor in a trust game (assuming the trustee wants to reciprocate). Interestingly, results by Thöni and Gächter (2010) suggest that the two elicitation methods produce very similar results in a trilateral gift-exchange game.

An employer could set different wages for each of her two employees. While they do not find differences for the lowest wage levels (most likely as plausible deviations would reduce reciprocation and there was no room below the already very low reciprocation levels), it is interesting to observe the differences of behavior at the high wage level. When the wage level of the other employee is low, reciprocation is relatively high in both the strategy and the direct response method. However, when the wage level of the other employee increases, the reciprocation level remains unchanged in the strategy method treatment, but there is a sharp drop in reciprocation levels in the direct response method. This behavior is consistent with a "cherry picking" strategy as described in this paper: It is harder to make the following argument in the strategy method, when knowing that my effort shall be independent of the other person's wage: " The other one gets paid so much as well, he will cooperate more, so I don't need to do so". Therefore, cherry picking provides an explanation why the strategy method gives different results when multiple motivations are possible.

Result 3 There is a correlation between second order beliefs and actions. It is higher for subjects who have a higher measured guilt sensitivity. This is true for all treatments.

We consider the role of second order beliefs in a regression framework in order to evaluate their significance for behavior. In order to avoid the critique of Vanberg (2008b) on using promises as second order belief shifters, we directly elicit second order beliefs to examine the correlation between them and observed behavior. In table 4 column 1 shows the pure treatment comparison, column 2 adds the behavior of the other trustee, column 3 considers second order beliefs, and column 4 guilt sensitivity.

The first two columns confirm the non-parametric tests that there exists a substantial wedge in behavior between leaders and followers and show that there seems to be a negative correlation between leader and follower behavior, however insignificant.

Column 3 confirms the positive and highly significant correlation of second order beliefs and pro-social behavior of trustees, in line with guilt aversion and found in previous studies. The coefficient of the second order belief is significantly lower for followers (0.430) than for leaders (1.139), however still statistically

[10] See, for instance, Casari and Cason (2009) or Rauhut and Winter (2010).

Table 3: Comparison of decision to reciprocate in the strategy method for followers

Follower type		**Conditioning on leaders choice**		
			(a)	(b)
	Strategy Method		**Direct Response**	**Strategy Method**
Left, uncond.	63.33% (19)	Leader left	16.30% (22)	26.67%
Right, uncond.	20.00%(6)	Leader right	6.66% (21)	30.00%
Compensators	6.67% (2)			
Conformist	10.00% (3)			
Total	100% (30)			

Note: This table reports the percentage of subjects who reciprocated and the absolute numbers in brackets, given the leader's decision. We categorize the subjects into four mutually exclusive types: (1) Unconditional left: subjects who never reciprocate, (2) Unconditional right: Subjects who always reciprocate, (3) Compensators: Subjects who reciprocate when the leader does not and don't reciprocate when she does (4) Conformists: Subjects who mimic the decision of the leader. The right hand side of the table gives the percentage of reciprocation conditional on the leader's choice predicted by (a) the direct response method (b) the strategy method.

significantly positive (5%-level). To further examine the role the second order beliefs take in describing behavior we add our measure for guilt sensitivity in column 4 of table 5, as well interacting it with the role of the subjects and the second order beliefs. The main effect of guilt sensitivity on the decision to ROLL is positive and significant at the 5%-level. Most importantly, the three-way interaction between guilt sensitivity, second order beliefs, and followers is positive and significant. These results confirm Hypothesis 2, 3 and to a lesser extent 4 for baseline and leader and follower trustees, which allows us to conclude that guilt is still strong motivating force, although it can get crowded out.

The observed behavior is not predicted by inequity aversion as there is a significant difference in trustee behavior between baseline and leader-follower treatment. It is also at odds with conformity seeking, which would suggest that the choice of leader trustees influences the behavior of follower trustees in a positive way. The resulting behavior is in line with what guilt aversion predicts as second order beliefs and the sensitivity of guilt are both correlated with the pro-social choice. However, the choices of follower trustees deviate from this pattern. Their behavior is consistent with collective guilt aversion where follower trustees shift responsibility to the leader trustee who has already reciprocated, giving support to 5. It seems followers – knowing that the trustor will not be empty-handed when they behave in a selfish way – feel less obliged to reciprocate. This reasoning should not disturb the unconditional belief of the follower trustee about the expectation of the trustor, because the follower knows that the trustor does not know how the leader will behave.

Table 4: Trustee behavior

	(1)	(2)	(3)	(4)
Follower	-0.171*** (0.064)	-0.181** (0.078)	0.104 (0.075)	1.308** (0.533)
Leader	0.123** (0.050)	0.125** (0.063)	0.025 (0.081)	-0.140 (0.288)
Age	-0.010 (0.017)	-0.011 (0.017)	-0.008 (0.012)	-0.005 (0.013)
Female	-0.085 (0.071)	-0.082 (0.071)	-0.075 (0.056)	-0.112** (0.056)
Other Trustee right		-0.109 (0.078)	-0.020 (0.069)	-0.019 (0.070)
Follower × other right		0.020 (0.117)	-0.101 (0.105)	-0.111 (0.105)
Leader × other right		-0.087 (0.167)	0.002 (0.158)	0.009 (0.154)
Second order belief			1.139*** (0.134)	2.882** (1.349)
Follower × s.o. belief			-0.709*** (0.236)	-3.871** (1.625)
Leader × s.o. belief			0.191 (0.202)	-0.859 (0.910)
Guilt sensitivity				0.015** (0.007)
Follower × guilt sens.				-0.020** (0.009)
Leader × guilt sens.				0.002 (0.005)
S.o. belief × guilt sens.				-0.028 (0.022)
Foll. × s.o. belief × guilt sens.				0.052* (0.027)
Lead. × s.o. belief × guilt sens.				0.018 (0.016)
Constant	0.590 (0.394)	0.633 (0.402)	0.143 (0.295)	-0.832* (0.502)
Combined coefficients				
Effect Sec ord. bel.: leader			1.331*** (0.245)	
Effect Sec ord. bel.: follower			0.430** (0.187)	
Effect guilt sens.: leader				0.036** (0.016)
Effect guilt sens.: follower				0.047* (0.026)
Observations	240	240	240	240
R^2	0.034	0.047	0.300	0.336
Clusters	144	144	144	144

Note: This table reports the result of a linear probability model, where the dependent variable is trustees choosing ROLL. Cluster robust standard errors are reported in parentheses. Cluster on subjects. We comparisons of trustee behavior in the baseline treatment with the behavior of leader and follower trustees. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

It is interesting to see in this context then, whether the leader actually thinks that she has an influence on the follower and, if yes, in which direction? A simple regression of the action of the trustees and their first order beliefs on what the other trustee does shows that there is a significant correlation between the leaders' belief over the followers' action (0.719, p-value < 0.01), while there is a positive, but less strong correlation (0.256, p-value: 0.133) between the followers' belief and the leaders' action. The former correlation indicates that the leader thinks she has a positive influence on the follower. The latter hints at a false consensus effect, however the difference between the two coefficients is only marginally significant at a 10% level. This observation leads us now to our strategy to control for the potential false consensus effect and to make causal arguments regarding the first order beliefs.

4.2 Controlling for potential false consensus effects

The false consensus effect is a potential reason why subjects' beliefs are correlated with actions (see Ross (1977) or Engelmann and Strobel (2000)). Vanberg (2008a) shows in a simple model that when beliefs of the state of the world are drawn from a common but unknown distribution and the signals, there is a correlation of the beliefs over the action of the other and the belief over his action and higher order beliefs. Within our regression analysis this poses the problem of unobserved variables bias as we do not control for the subjective belief over the state of the world or belief over the distribution of traits in a society, and the cause of the second order belief. However, we claim that it is relatively easy to find a proxy for the unobserved variable by measuring the belief how *other trustees* behave. Asking for this belief appears to be particularly credible in our 3-player design, since there actually exists one other trustee. We claim that the belief over the behavior of the other trustee is the subject's belief over the distribution of the unobserved trait in the world. Controlling for this effect allows us to interpret the second order belief as causal and the estimate of the size of the coefficient becomes more accurate.[11]

The first two columns of table 5 show basic regressions with the first order belief over the other trustee (1), and with the second order belief (2). All observations with available first order belief over the other trustee are used ($N = 64$). Used separately both are highly significant. Column 3 shows that, when controlling for first order beliefs of the other trustee, the coefficient of the second order beliefs drops from 0.842 to 0.566, suggesting subjects are prone to a false consensus effect of roughly the same magnitude as estimated by Bellemare et al. (2011). However, the coefficient on the second order beliefs is still large and significant, which indicates a causal relationship between second order beliefs and decisions, which further supports our claim of the crowding out of guilt.

Finally, column 4 shows the importance of guilt sensitivity, measured by the TOSCA-3 scale. While the coefficient of the second order beliefs drops substantially and gets – insignificantly – negative, the

[11] A different approach is taken by Bellemare et al. (2011) who draw the identification from informing subjects of the first order beliefs of the principal and from situations where they vary the degree of guilt subjects may feel, including situations where they should not feel guilty at all when taking a particular action.

interaction of the measure of guilt sensitivity and second order beliefs is significant and positive. This means that the influence of the second order beliefs on behavior are more important for subjects who are more sensitive to guilt, while the main effect measures the effect of the second order beliefs on the least guilt sensitive subject.

Table 5: Trustee behavior: Tackling false consensus

	(1)	(2)	(3)	(4)
Follower	-0.137* (0.070)	-0.137** (0.067)	-0.137** (0.067)	0.081 (0.099)
Leader	0.123** (0.061)	0.103* (0.057)	0.114** (0.057)	0.040 (0.099)
Trustee: First ord. belief other	0.749*** (0.122)		0.436*** (0.127)	0.382*** (0.138)
Age	-0.001 (0.015)	-0.002 (0.015)	0.000 (0.014)	0.003 (0.013)
Female	-0.074 (0.070)	-0.096 (0.068)	-0.091 (0.066)	-0.115* (0.064)
Second order belief		0.842*** (0.148)	0.566*** (0.166)	-0.798 (0.775)
Other Trustee right				0.023 (0.079)
Follower × other right				-0.167 (0.127)
Leader × other right				0.072 (0.150)
Follower × s.o. belief				-0.463* (0.262)
Leader × s.o. belief				0.124 (0.201)
o.Trustee: Second order belief				0.000 (.)
Guilt sensitivity				-0.000 (0.004)
SO belief × guilt sens.				0.026** (0.013)
Constant	0.082 (0.359)	0.106 (0.362)	-0.009 (0.328)	-0.102 (0.445)
N	64	64	64	64
R	3	3	3	3
Observations	192	192	192	192
R^2	0.220	0.240	0.284	0.343

Standard errors in parentheses

Linear probability model, where the dependent variable is trustees chosing to 'roll'.

Comparisons to the baseline, where trustees decide simultaneously.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

We use the similar strategy to measure the belief of the leader on her influence on the follower. We pool the data from the leader-follower treatment with the baseline treatment. Then we regress the first order belief of the $B1$s on their choice, and interact this with the leader. The B1s in the leader-follower treatment are the leaders, so if we belief that randomization did work, we can interpret the coefficient

Table 6: Believed influence of leaders

B1 right	0.143* (1.71)
LF	-0.0754 (-1.35)
Right X LF	0.129 (1.49)
Constant	0.359*** (7.67)
Observations	96

t statistics in parentheses

Cluster robust standard errors, clustered by ID

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

on the interaction term as as the average leader's belief of her influence, having controlled for the false consensus effect in an average sense. This coefficient is positive, however insignificant so the belief over her actual influence is rather low.

4.3 Trustor behavior and beliefs

When we compare the total rolling behavior of the trustees between the two treatments, we find that on average 30% of the trustees roll in the baseline treatment, while – on average over leaders and followers – only 20% do so in the leader follower treatment. This difference is significant at the 10% level (test of proportion, p-value: 0.074). However, this does not seem to be anticipated by trustors. They belief that subjects will roll 35% of the time, irrespective of the treatment (t-test, p-value: 0.464, ranksum test, p-value: 0.581). This non-difference in beliefs is reflected in a non-difference in behavior, where around 32% of the trustors choose to trust in both treatments (test of proportion, p-value: 0.740). Furthermore, in the leader follower treatments trustors do not belief that leader's act more often pro-socially than followers (33% vs 38%, signrank test, p-value: 0.223)

Table 7 shows the results of the regression of the choice of the trustor on first and second order beliefs interacted with the treatment variable, similar to the tables for the trustees. We do not observe strong treatment effects when controlling for second order beliefs. Those, however, are strongly correlated with actual behavior, even more than the first order beliefs, which would represent the actual materially relevant variable determining leaders' choice.

5 Discussion

In a framework with one principal and two agents we investigate how actions taken by the lead agent affect the choice of the follower agent, comparing it to a situation where choices are taken simultaneously.

Our results show that trustees are in fact driven by guilt aversion: their second order beliefs in connection with their sensitivity to guilt give them orientation about the disappointment they would inflict on the trustor. However, our results also suggest that the positive effect of guilt aversion on pro-social behavior easily vanishes, if alternative signals – that are possibly more direct and materially advantageous – are available to trustees. In our context the pro-social choice of the leader trustee appears to be such a direct signal. While the processes of guilt aversion (second order beliefs and sensitivity to guilt have a positive effect on behavior) still appear to work for follower trustees, they choose the pro-social option significantly less often. In particular they do so when the leader has chosen to play pro-social. It seems that follower trustees tend to *shift responsibility* to the leader, and disregard their second order belief. Shafir et al. (1993) argue that subjects always chose reasons why they act as they do. The leader gives a suggestion of how to behave in a socially ambiguous situation, but interestingly she seems to be perceived in an asymmetric way. If the leader trustee took responsibility, the follower trustee tends to play selfish. It appears the follower is happy to shift the responsibility towards the trustor to the leader trustee. However, following example is not attractive when it involves a material disadvantage. Instead, it seems that the leader's action serves to salve the follower's conscience and the path is clear for performing a selfish act. If the leader trustee did not cooperate, the story is different, yet the result is the same. When following example involves material gains, follower trustees seem to be willing to conform to the leader's action and play selfish as well. Interestingly, this kind of cherry picking behavior – following the signal or applying the social norm that provides the best monetary payoff – has also been found in other contexts, e.g., Winter et al. (Forthcoming) or Konow (2005) for a more general overview of the self-serving bias. Our findings are also very much in line with the results of Gächter and Thöni (2012), a trilateral gift exchange game and probably the experimental study closest to ours. Both agents select an effort level in response to the principal's wage (same for both agents). In a surprise stage agents are informed about the co-agent's effort choice and can revise their own effort. Agents decrease their effort strongly when they observe a co-agent who expended less effort than them, but barely increase effort when they observe that the co-agent expended more effort.

Our results suggest that guilt aversion has only limited predictive power in the group situation that we analysed. While we do find behavior that corresponds with guilt from blame in the domain where the leader chooses ROLL, in the domain where the leader chooses NOT to ROLL we observe behavior that stands in stark contrast to the prediction of guilt from blame. The positive effects of guilt aversion on behavior seem to be easily dominated, when other relevant input for the decision to be made is available. This liability of being replaced by other signals – if there are some – may explain the differing results in existing studies about guilt aversion. The original article of Dufwenberg and Gneezy (2000) but also Charness and Dufwenberg (2006) and others do find a positive correlation between *second order beliefs* and pro-social behavior. However, Ellingsen et al. (2010) and others (Kulisa and Roemer (2009) or Kawagoe and Narita (2010)) fail to find such a correlation. These studies use the reported beliefs of

trustors to install second order beliefs in trustees. As we have illustrated second order beliefs are prone to be disturbed by other signals, though. They might get crowded out by the slightest doubt about the trustworthiness of these reported beliefs (i.e. trustees may believe they were given strategically), or subjects perceive the reported beliefs as normative.

We also find that a *"false consensus" effect* biases the coefficients of the second order beliefs upward in a simple regression model. We approach this problem by treating the "false consensus effect" as an omitted variables bias, controlling for subjects' belief of the world by introducing the first order belief over what trustees expect the other trustee does. Our setting, a 3-player design with two trustees, appears to be particularly useful for such an approach since there actually exists one other trustee. Like Bellemare et al. (2011) and Costa-Gomes et al. (2010) who also control for false consensus effects in trust games we still find a substantial effect of second order beliefs. Our procedure reduces the bias roughly by the same amount found in Bellemare et al. (2011). We therefore suggest this as a new and simple strategy to reduce the causality problem of regressions on second order beliefs.

In addition to the role second order beliefs play we also find compelling evidence for the importance of *guilt sensitivity* as a determinant of behavior. The main effect of guilt sensitivity on the decision to ROLL is positive and significant at the 5%-level. Most importantly, the three-way interaction between guilt sensitivity, second order beliefs, and followers is positive and significant.

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A Randomization Checks

Baseline	*Age*	*Female*	*Risk aversion*	*Guilt (TOSCA)*	*Shame (TOSCA)*
Mean	22.87	0.64	1.33	60.71	44.54
Std. dev.	2.37	0.48	1.64	6.83	8.75
Minimum	19.00	0.00	0.00	43.00	25.00
Maximum	31.00	1.00	5.00	74.00	63.00
Leader Follower					
Mean	22.03	0.64	1.17	60.96	45.46
Std. dev.	2.40	0.48	1.73	7.96	8.92
Minimum	14.00	0.00	0.00	38.00	19.00
Maximum	28.00	1.00	5.00	75.00	62.00
Difference	0.841*	0.003	0.167	-0.250	-0.917
Observations	168				

Age different because of one outlier, caused by wrong entry of the age (there were no 14 year-old in the sample)

B Log-log specification

Table 8 estimates a log-log model of trustees behavior on second order beliefs and guild sensitivity. This specification takes into account that in models of guilt aversion guilt sensitivity enters multiplicative.

C Derivations of Predictions

C.1 Fairness

We analyze the game depicted in 3, however first for the case where all players have full information: the leader follower case. We derive the backward induction solution of the game.

For the decision node of $B2$ after $B1$ has chosen r_1, B2 will chose r_2 if $10 > 14 - 6.5\beta$. This implies that β has to be larger than $\frac{8}{13}$. So B2 will chose r_2.

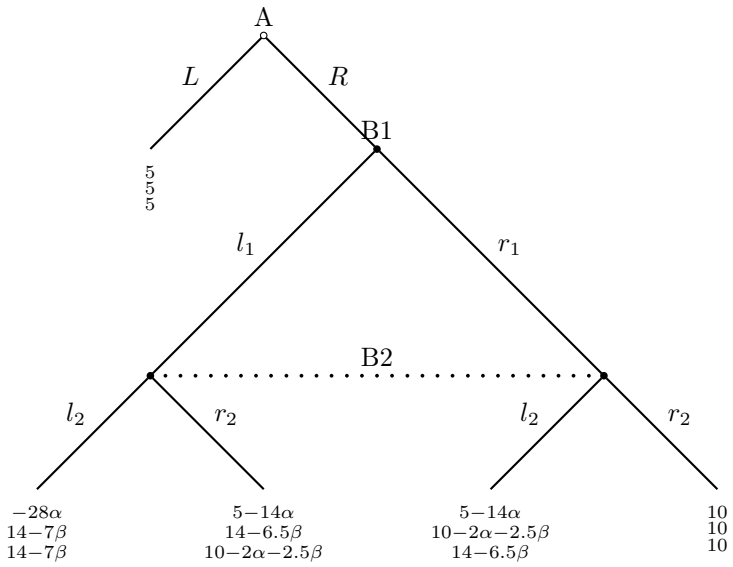

Figure 3: Simultaneous move game – Fehr Schmidt payoffs

For the decision node of $B2$ after $B1$ has chosen l_1, $B2$ will chose r_2 if $10 - 2\alpha - 2.5\beta > 14 - 7\beta$. Which implies that $\beta > \frac{8}{9} + \frac{4}{9}\alpha$ which implies that even for an $\alpha = 0$ even less subjects should chose r_2.

Given that in both cases $B2$ choses l_2, $B1$ will chose l_1 out of the same reason that B2 chooses l_2 on her first decision node. And consequently A shall chose L. This leaves us with the clear prediction that leaders and followers shall behave the same for the same reason and therefore we should not see a difference in their behavior.

C.2 Guilt from Blame

Besides τ_A (A's initial belief about the probability that B picks ROLL) and τ_B (B's interim (conditional on A choosing IN) belief regarding τ_A) let $\hat{\tau}_A^x$ be A's ex post belief about the probability that B ROLLs given A's payoff $x \in \{0, 12\}$. Then $\hat{\tau}_B^a$ denotes B's interim belief about $\hat{\tau}_A^x$ depending on B's action $a \in \{ROLL, NOTROLL\}$ and conditional on A choosing IN. We will also use A's ex-post belief about $\hat{\tau}_B^a$, denoted by κ_A, and B's interim belief about κ_A, denoted by λ_B, that is, beliefs to the third and fourth order.

In addition, τ_{B1}^{B2} denotes $B1$'s belief about the probability that $B2$ picks ROLL.

B's utility depends on his monetary payoff x minus guilt-from-blame, which is determined by B's proneness to guilt γ_B, the believed extent of intent λ_B, and B's belief about A's expected payoff difference for which B is blamed τ_B (B's belief (conditional on A choosing IN) about A's belief τ_A about the

probability that B ROLLs): $U_{B2} = x - \gamma_{B2} \cdot \lambda_{B2} \cdot 10 \cdot \tau_{B2}$

Most importantly, A can only use her payoffs to form her ex post belief κ_A about B's intention to disappoint. If A gets 12, she knows both Bs must have ROLLed and bad intentions can be excluded. In the case of $B2$ this means $B2$'s intention to disappoint if A receives a payoff of 12 is $\kappa_{B2}^{x=12} = 0$. If A gets 6, she knows that either one B ROLLed and she got lucky, while the other B did NOT ROLL, or both ROLLed and she was unlucky in one case. A would blame B only in the case of opportunism and, therefore, A's belief about $B2$'s intention to disappoint, given that A's payoff is 6 and applying Bayes's rule, is $\kappa_{B2}^{x=6} = E[\hat{\tau}_B^{x=6}] = E[\frac{\tau_{B1} \cdot (1-\tau_{B2}) \cdot 5/6}{\tau_{B1} \cdot (1-\tau_{B2}) \cdot 5/6 + (1-\tau_{B1}) \cdot \tau_{B2} \cdot 5/6 + \tau_{B1} \cdot \tau_{B2} \cdot 10/36}] \cdot \frac{1}{2}$ (When A receives 6 instead of 12, she will assign only half of the blame that she would have had she received 0). If A gets 0, she knows that either both Bs did NOT ROLL, one B ROLLed and she got lucky, while the other B did NOT ROLL, or both ROLLed and she was unlucky twice. Again, A would blame B only in the case of opportunism and, therefore, A's belief about $B2$'s intention to disappoint, given that A's payoff is 0 and applying Bayes's rule, is $\kappa_{B2}^{x=0} = E[\hat{\tau}_B^{x=0}] = E[\frac{(1-\tau_{B1}) \cdot (1-\tau_{B2}) + \tau_{B1} \cdot (1-\tau_{B2}) \cdot 1/6}{(1-\tau_{B1}) \cdot (1-\tau_{B2}) + \tau_{B1} \cdot (1-\tau_{B2}) \cdot 1/6 + (1-\tau_{B1}) \cdot \tau_{B2} \cdot 1/6 + \tau_{B1} \cdot \tau_{B2} \cdot 1/36}]$.

Recall that λ_B denotes B's interim belief, that is, his belief conditional on A choosing RIGHT, about κ_A, A's ex post belief about B's intention to disappoint. If $B2$ selects NOT ROLL, A's payoff can be 0 or 6 depending on $B1$'s choice. It follows that $B2$'s interim belief, taking into account $B2$'s belief about $B1$'s choice τ_{B2B1}, is $\lambda_{B2}^{NR} = (1-\tau_{B2B1}) \cdot 1 \cdot E[\kappa_{B2}^{x=0}] + \tau_{B2B1} \cdot (1/6 \cdot E[\kappa_{B2}^{x=0}] + 5/6 \cdot E[\kappa_{B2}^{x=6}])$. Alternatively, if $B2$ selects ROLL, A's payoff could be 0, 6 or 12, again depending on the choice of $B1$. If, for instance, both $B1$ and $B2$ ROLL, then with probability $1/36$ A receives 0, with probability $10/36$ A receives 6, and with probability $25/36$ A's payoff would be 12 which causes no blame. Consequently, $B2$'s interim belief is $\lambda_{B2}^{R} = (1 - \tau_{B2B1}) \cdot (1/6 \cdot E[\kappa_{B2}^{x=0}] + 5/6 \cdot E[\kappa_{B2}^{x=6}]) + \tau_{B2B1} \cdot (1/36 \cdot E[\kappa_{B2}^{x=0} + 10/36 \cdot E[\kappa_{B2}^{x=6}])$. B decides to ROLL if the following inequality holds:

$$U_{B2}^{NR} = 14 - \gamma_{B2} \cdot \lambda_{B2}^{NR} \cdot 10 \cdot \tau_{B2} \quad < \quad 10 - \gamma_{B2} \cdot \lambda_{B2}^{R} \cdot 10 \cdot \tau_{B2} = U_{B2}^{R} \tag{2}$$

$$\frac{.4}{\lambda_B^{NR} - \lambda_B^R} \quad < \quad \gamma_{B2} \cdot \tau_B \tag{3}$$

The denominator is always positive since $\lambda_B^{NR} > \lambda_B^R$ for any τ_B. The greater the product of $\gamma_{B2} \cdot \tau_B$ is, the more likely B will choose to ROLL. This is in line with the simple guilt hypotheses.

In the leader-follower condition $B2$ is informed about the choice of $B1$. $B2$ can use this information to update his belief λ_{B2} about A's ex post belief about $B2$'s intention to disappoint. In case the leader agent $B1$ selected NOT ROLL $B2$'s updated belief $\hat{\tau}_{B2B1} = 0$ and $B2$'s interim belief when selecting NOT ROLL knowing that $B1$ already chose NOT ROLL becomes $\lambda_{B2}^{NR,B1NR} = E[\kappa_{B2}^{x=0}]$. Instead, when selecting ROLL given that $B1$ already chose NOT ROLL $B2$'s interim belief becomes $\lambda_{B2}^{R,B1NR} = 1/6 \cdot E[\kappa_{B2}^{x=0}] + 5/6 \cdot E[\kappa_{B2}^{x=6}]$.

In case $B1$ already chose NOT ROLL $B2$ will prefer ROLL to DON'T ROLL if:

$$U_{B2}^{NR,B1NR} = 14 - \gamma_{B2} \cdot \lambda_{B2}^{NR,B1NR} \cdot 10 \cdot \tau_{B2} \quad < \quad 10 - \gamma_{B2} \cdot \lambda_{B2}^{R,B1NR} \cdot 10 \cdot \tau_{B2} = U_{B2}^{R,B1NR} \tag{4}$$

In case $B1$ selected ROLL $B2$'s updated belief $\hat{\tau}_{B2B1} = 1$ and $B2$'s interim belief when selecting NOT ROLL knowing that $B1$ already chose ROLL becomes $\lambda_{B2}^{NR,B1R} = 1/6 \cdot E[\kappa_{B2}^{x=0}] + 5/6 \cdot E[\kappa_{B2}^{x=6}]$. Instead, when selecting ROLL given that $B1$ already chose ROLL $B2$'s interim belief becomes $\lambda_{B2}^{R,B1R} = 1/36 \cdot E[\kappa_{B2}^{x=0}] + 10/36 \cdot E[\kappa_{B2}^{x=6}]$.

In case $B1$ already chose to ROLL $B2$ will prefer ROLL to DON'T ROLL if:

$$U_{B2}^{NR,B1R} = 14 - \gamma_{B2} \cdot \lambda_{B2}^{NR,B1R} \cdot 10 \cdot \tau_{B2} \quad < \quad 10 - \gamma_{B2} \cdot \lambda_{B2}^{R,B1R} \cdot 10 \cdot \tau_{B2} = U_{B2}^{R,B1R} \tag{5}$$

How does the treatment change from baseline to leader-follower affect behavior? The following expression shows that it becomes more attractive for $B2$ to NOT ROLL than to ROLL, when $B2$ knows that $B1$ already ROLLed:

$$\lambda_{B2}^{NR} - \lambda_{B2}^{NR,B1R} \quad > \quad \lambda_{B2}^{R} - \lambda_{B2}^{R,B1R} \tag{6}$$

Likewise, it becomes less attractive for $B2$ to NOT ROLL than to ROLL, when $B2$ knows that $B1$ did NOT ROLL:

$$\lambda_{B2}^{NR} - \lambda_{B2}^{NR,B1NR} \quad < \quad \lambda_{B2}^{R} - \lambda_{B2}^{R,B1NR} \tag{7}$$

D Experimental Instructions

Welcome and thanks for participating in this experiment.

In this experiment you can earn a certain amount of money, which depends on your and the other participants' decisions in this experiment. **It is, therefore, very important that you read the following instructions carefully.**

Please be aware that you are not allowed to talk to other participants during the entire experiment. If you have any questions or concerns, please raise your hand. We will answer your questions individually. Please do not ask your question(s) aloud. It is very important that you follow these rules, since otherwise we have to stop the experiment. Please also turn off your mobile phones now.

General Procedure

The experiment lasts about 90 minutes. Each decision will be explained again briefly on the monitor.

Your payoff from this experiment depends on your decisions and, possibly, the ones other participants make. The exact procedure your payoff is calculated is explained further below.

Your payoff will be calculated in ECU (Experimental Currency Units), 1 ECU = 0,5 EURO. At the end of the experiment your earnings will be converted into EURO and you are paid in cash.

In addition you receive 2,50 Euro as a show-up fee.

After you filled in a questionnaire the experiment ends and you will receive your payoff.

Again the procedure as an overview:

1. Reading of the instructions, test questions (online)
2. Decision situations
3. Questionnaire
4. Payoff and end of the experiment

Details of the experiment

Always three participants interact with each other. They are called participant A, participant B1 and B2. The following decision situation will be **played several times**, i.e., there will be several periods. Whether you are participant A, B1 or B2 will be determined at the beginning of each period. Hence, it is very important that you **familiarize yourself with each of the roles**. You will only learn about your payoff at the very end of the experiment, not after each period. Out of all the periods that you play, two periods will be relevant for your final payoff.

Decision Situations

In this game participant A will make a decision first. He/She can decide in favor of option "left" or "right".

- The choice of "left" implicates a specific payoff, which is 5 ECU for participant A, 5 ECU for participant B1 and 5 ECU for participant B2.
- If participant A chooses option "right", the payoffs for each of the three participants will be determined by participants B1 and B2.

Then, first B1 and afterwards B2 can choose between two options:

- A decision of "left" means a payoff of 0 for participant A and a payoff of 14 ECU for participant B1 as well as B2.
- A decision of "right" means, that:
  - with a probability of 1/6 (approximately 17%) there will be a payoff of 0 ECU for participant A and a payoff of 10 ECU for participant B1 as well as B2.
  - with a probability of 5/6 (approximately 83%) there will be a payoff of 6 ECU for participant A and a payoff of 10 ECU for participant B1 as well as B2.

Both, participant B1 and B2, will always be asked for his/her decision, regardless if participant A has chosen "left" or "right".**None of the participants can observe or will be informed about the decisions the other participants make.**

Examples for the payoffs:

- If A chooses 'left', all 3 participants will receive 5 ECU from this period.
- If all participants choose 'right' ...
  - it is very likely, that A receives 12 ECU.
  - B1 and B2 each receive 10 ECU.

That means, A can receive a maximum payoff of 12 ECU, because he/she plays with B1 as well as with B2.

The following diagrams illustrate the game and the resulting payoffs:

[diagram illustrating the interaction]

As B2 you will learn about the decision of B1 before you have to make your own decision.

Estimates

Besides the choice of your actions you will be asked for

- your expectation concerning the other participant's action
- your estimates of the expectation of the other participant concerning your own action

You can earn money with these estimates. **The closer you are to the real amount the more you earn.** Therefore it is important for you to read the instructions carefully.

You are able to split your estimate in different intervals. Please indicate the estimated probability with a value between 0 and 100. Please consider that all probabilities must sum up to 100.

Example for stating your estimates

100 Students took an exam. The possible grades for the evaluation of the exams are 1, 2, 3, 4, and 5.

You know that the knowledge about the exam's topic is equally distributed amongst the students who have taken the exam, i.e., there are just as many very good results as there are very poor results. Hence, **every grade is equally probable.**

To maximize your profit your estimate should look like this.

[table with the distribution]

You insert the same probability in each box. There are five intervals, hence, the probability results in 100 / 5 = 20.

Payoff

Your payoff from these estimates depends on how close your estimates were to the actual results from this experiment. The closer you are to the real amount the more you earn.

The maximum earning per estimate is 3 ECU. The actual figure is defined taking all participants into account.

In any case it is best for you to state your actual/true estimates. Upon request you can (after the experiment) look at how your earnings from the estimates were calculated in detail.

Your payoff from the experiment

You will be paid your earnings in cash directly after the end of the experiment, that means after you completed a final questionnaire.

Table 7: Trustor behavior

RIGHT	(1)	(2)	(3)	(4)
LF	-0.0284	-0.00843	0.0528	0.0528
	(-0.33)	(-0.12)	(0.57)	(0.57)
Trustor: First order belief		0.396*	0.331	0.529*
		(1.93)	(1.56)	(1.70)
Trustor: First order belief over leader		0.0504	0.183	-0.0150
		(0.20)	(0.59)	(-0.05)
Trustor: Second order belief		0.820***	0.829***	0.829***
		(3.62)	(3.57)	(3.57)
LF × First order belief over leader			-0.198	
			(-0.76)	
Risk aversion			-0.0238	-0.0238
			(-1.14)	(-1.14)
LF × First order belief				-0.198
				(-0.76)
Constant	0.339***	-0.110*	-0.0997	-0.0997
	(5.59)	(-1.71)	(-1.14)	(-1.14)
Observations	120	120	120	120

t statistics in parentheses

Cluster robust standard errors, clustered by ID

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Log linear model of Trustee behavior and Guilt Sensitivity

	(1)	(2)	(3)
	Baseline	Leader	Follower
Log s.o. belief	1.353***	0.957***	0.543***
	(0.173)	(0.224)	(0.188)
Log Guilt Sensitivity	1.679	2.965**	0.576
	(1.675)	(1.354)	(1.050)
Constant	-8.266	-14.325**	-5.565
	(6.830)	(5.435)	(4.246)
Observations	124	58	58
R^2	0.310	0.199	0.100

Standard errors in parentheses

Log-linear model, where the dependent variable is the log of trustees chosing to 'roll'.

Comparisons to the baseline, where trustees decide simultaneously with leaders and followers.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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