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Determinants of trust: the role of personal experiences

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Determinants of trust: the role of personal experiences

Abstract

Social interactions pervade daily life and thereby create an abundance of social experiences. Such personal experiences likely shape what we believe and who we are. In this paper, we ask if and how personal experiences from social interactions determine individuals' inclination to trust others? We implement an experimental environment that allows us to manipulate prior social experiences—either being paid or not being paid by a peer subject for a task—and afterwards measure participant's willingness to trust others. We contrast this situation with a control condition where we keep all aspects of the prior experiences identical, except that we remove the social dimension. Our key finding is that after positive social experiences, subjects' willingness to trust is substantially higher relative to subjects who made negative social experiences. No such effect is obtained in the control condition where we removed the social aspect of experiences. Findings from a difference-in-difference analysis confirm this pattern. Our results cannot be explained by rational learning, income effects, pay or social comparison related mood, disappointment aversion and expectations-based or social reference points. Delving into the underlying mechanisms, we provide evidence that non-standard belief patterns are an important driver of experience effects.

JEL-Codes: C910, D030, D810.

Keywords: determinants of trust, experiences, beliefs, non-standard learning, experiments.

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1 Introduction

Trust is a pervasive feature of human relationships. It constitutes a social lubricant for any kind of transactions. In particular, trust allows the realization of (efficiency) gains from trade and cooperation when contracts are incomplete or too costly to be enforced (Arrow, 1974). Ample evidence suggests that trust fosters aggregate social and economic outcomes (see, e.g., Putnam, 1995; La Porta, Lopez-de Silanes, Shleifer and Vishny, 1997; Knack and Keefer, 1997; Guiso, Sapienza and Zingales, 2004). However, trust cannot be taken for granted. It requires individuals to make themselves and their resources vulnerable to exploitation by others. Understanding the determinants of trust hence poses an important challenge for the social sciences and has potentially far-reaching implications for policy and workplace design.

The decision to trust others is typically conceptualized as an interplay of the institutional setting, capturing the incentives and constraints that individuals face, and individual primitives such as prior beliefs and preferences.[1] Traditionally, economic research has focused primarily on institutional factors—for instance, by implementing reputational concerns through feedback mechanisms and competition (see, e.g., Camerer and Weigelt, 1988; Bolton, Katok and Ockenfels, 2004; Charness, Cobo-Reyes and Jiménez, 2008; Charness, Du and Yang, 2011; Huck, Lünser and Tyran, 2012; Wibral, 2015).

In this paper, we study the malleability of individuals' willingness to trust others beyond institutional forces. We start from the observation that individual behavior is embedded in a constant flux of social interactions that can lead to positive and negative experiences. As emphasized in Akerlof (1983), such personal experiences are often powerful and particularly meaningful events to individuals, with the consequence that when "people go through experiences, frequently their loyalties, or their values, change" (Akerlof, 1983). Indeed, evidence presented in Alesina and La Ferrara (2002) for instance suggests that prior (traumatic) experiences and belonging to groups that (historically) have been discriminated are negatively associated with trust.

Taking this as point of departure, we implement a novel experimental set-up to make the following contributions: First, we provide *causal* evidence that prior social experiences shape people's willingness to trust others. Using a difference-in-difference approach, we pin down the critical role of the *social* aspect of prior experiences. Neither rational learning, nor income effects, pay-related mood, disappointment aversion or reference-dependence can explain our results. Second, delving into the underlying

[1] This is not to say that institutions and individual primitives are unrelated entities (Greif, 1994).

mechanisms, our findings highlight the important role of non-standard belief patterns as a driver of social-experience effects.

In our main treatments, we employed a 2 (positive vs. negative) $\times$ 2 (social vs. non-social) factorial design: specifically, we exogenously varied whether subjects made positive or negative experiences as well as whether these experiences were social in nature or determined by a random device. Our main treatments had two stages: In Stage 2, we measured subjects' willingness to trust by employing a variant of Berg, Dickhaut and McCabe's (1995) trust game. Subjects decided to trust or not to trust a randomly assigned second-mover subject or trustee.[2] In addition, we elicited subjects' beliefs about the trustworthiness of trustees. In Stage 1, we implemented experiences in a controlled way. Subjects worked on a real effort task where it was uncertain whether they would be paid for completing it. Whether subjects were paid or not was determined as follows: In the non-social condition, a random device determined subjects' pay. In the social condition, subjects were randomly assigned to dictator subjects, who determined their pay.[3] Thus, we implemented exogenous variation in whether subjects made a positive—they were paid—or negative—they were not paid—experience and whether this experience was social or non-social in nature. Importantly, subjects in the social treatment were informed about the distribution of prosocial and selfish dictators in Stage 1 before moving to Stage 2. Therefore, negative and positive experiences in the social condition did not contain any objective information about the level of prosociality in society. In other words, rational learning cannot explain potential experience effects in the social treatment.

Our identification strategy builds on a difference-in-differences analysis where we compare experience effects on subjects' willingness to trust between the social and the non-social condition. This allows us to isolate the social aspect of experience effects and rules out outcome-based explanations such as income effects, pay-related mood, disappointment aversion and reference-dependence. We find a significant and sizeable experience effect on trust behavior in the social condition. Subjects who experienced being paid prior to the trust decision showed a greater willingness to trust subjects who experienced not being paid. The amount entrusted is more than twice as large

[2] A vast literature centers around the trust game and among others shows that it is reducible to individual primitives: beliefs regarding the trustworthiness of the involved parties (Costa-Gomes, Huck and Weizsäcker, 2014); preferences with respect to "social risk taking," for instance, betrayal aversion (Bohnet and Zeckhauser, 2004); and preferences with respect to the outcomes of others (Cox, 2004; Ashraf, Bohnet and Piankov, 2006). See, for instance, Fehr (2009) for an overview. A recent literature also looks at the *biological* foundations of trust (see, e.g., Fehr, Fischbacher and Kosfeld, 2005; Kosfeld, Heinrichs, Zak, Fischbacher and Fehr, 2005).

[3] Dictator subjects did not participate in the trust game.

after positive than negative social experiences. Importantly, difference-in-difference regressions reveal that this treatment effect is significantly larger than in the non-social treatment, providing *causal* evidence for *social* experience effects on trust.

In a second step we attempt to uncover the mechanisms underlying social-experience effects. We focus on non-standard belief effects as a potential channel.[4] Beliefs about the trustworthiness of others are arguably a key determinant of trust. A potential mechanism could be that subjects' beliefs about others' trustworthiness are affected disproportionately by past experiences in similar contexts that easily come to mind and then dominate attention. Such an account of non-standard experience-based belief formation relates to recent models of boundedly rational belief formation (e.g. Gennaioli and Shleifer (2010); Bordalo, Coffman, Gennaioli and Shleifer (2016)) and postulates that when contemplating about whether or not to trust others, prior *social* experiences become salient and shape the corresponding process of belief formation.[5] We exploit a measure of subjects' beliefs about the trustworthiness of other subjects. Again relying on a difference-in-difference identification approach, we find that beliefs about the trustworthiness of others are affected by social experiences, but not by non-social experiences.[6]

To demonstrate robustness of our findings and to corroborate the belief result, we in addition conducted a tweaked version of our experimental set-up. These additional treatments focus on beliefs as single outcome measure, and implement several changes to our baseline setting that allow us to assess the robustness of our findings. While Stage 1 of these robustness experiments continues to administer social or non-social experiences depending on the respective treatment, Stage 2 consists of a mere belief elicitation task. Subjects do not actually participate in a trust game, but instead state their beliefs, facing financial incentives for accuracy, regarding the trustworthiness of others. Complementary and consistent with our previous evidence, we find that social experiences substantially affect subjects' beliefs about the trustworthiness of others, while non-social experiences do not.

[4]As outlined above, neither our findings on trust nor our findings on beliefs about others' trustworthiness can be explained by rational learning.

[5]Specifically, when facing a trust decision, prior social experiences likely come to mind and disproportionately shape beliefs about others' trustworthiness, where positive experiences cause optimistic beliefs while negative experiences cause pessimism. Non-social experiences are arguably less similar to the trust situation and thus likely come to mind less easily, implying a smaller influence on the belief formation process. See Bordalo, Gennaioli and Shleifer (2017) for an account of similarity-based cognition in the context of memory and choice.

[6]Notice that, while our results highlight the important role of non-standard belief formation, other factors might also contribute to the social experience effect on trust behavior. We discuss these factors in more detail in Section 4.

This paper contributes to several literatures. Falk, Becker, Dohmen, Enke, Huffman and Sunde (2018) document substantial within-country heterogeneity of trust, based on a globally representative dataset. In fact, this heterogeneity is greater than the corresponding between-country heterogeneity. Importantly, little is known about the determinants of the large variation of trust within countries, i.e., within a given institutional framework. Our results can be viewed as a first step to uncover this heterogeneity by underscoring the importance of *social* experiences as a driver of differences in individuals' willingness to trust within institutional settings.[7]

Our findings also relate to the recent literature on the influence of macroeconomic experiences on individuals stock market participation (Malmendier and Nagel, 2011), inflation expectations (Malmendier and Nagel, 2016), and preference for redistribution (Giuliano and Spilimbergo, 2014). By studying experience effects in a controlled laboratory environment, we can highlight patterns that are difficult to identify with observational data. First of all, our findings underscore the paramount importance of *personal* experiences. In our experiment, all subjects knew that other subjects made positive and negative experiences. However, only personal experiences affected behavior. Second, our findings reveal that non-standard belief patterns seem to be a key ingredient of experience effects.

Relatedly, our results contribute to the literature on non-standard belief formation. Following Tversky and Kahneman (1974), individuals' belief formation is increasingly understood to be affected by specific heuristics, most prominently availability (Tversky and Kahneman, 1973) and representativeness (Gennaioli and Shleifer, 2010; Bordalo et al., 2016) which allow individuals to make quick but often biased probabilistic judgements, as well as limited attention more broadly (Enke and Zimmermann, 2019; Enke, 2018). In this paper, we provide evidence that belief formation is affected by recent personal experiences that have an associative link to the specific decision context at hand. When contemplating about the trustworthiness of another person, recent social interactions—but not non-social experiences—seem to come to mind and influence beliefs—even if these encounters did not contain any relevant information.

The remainder of this paper is organized as follows. Section 2 presents the main version of our experimental design and the corresponding empirical results. Section 3

[7]Relatedly, Dohmen, Falk, Huffman and Sunde (2012) and Kosse, Deckers, Schildberg-Horisch and Falk (2016) study effects of the social environment on trust: Dohmen et al. (2012) document strong associations of trust attitudes between individuals and their parents in Germany (see also Nunn and Wantchekon, 2011); Kosse et al. (2016) show causal evidence that providing low socio-economic-status children with a (trustworthy) mentor for the duration of a year fosters their trust. While these studies cannot point to specific mechanisms through which social environment effects operate, our results contribute by showing that specific and well-defined social experiences affect trust.

presents the tweaked version of our experimental design and the corresponding empirical results. Section 5 concludes.

2 Social-Experience Effects on Trust

We wanted to implement an experimental environment that would meet the following challenges: (i) expose subjects to random experiences to establish causality; (ii) switch the social component of experiences on and off; (iii) have a clean incentivized measure of trust; (iv) implement experiences that are in a fully rational sense unrelated to the trust decision. In this section, we discuss how we implemented these features in our main experimental design. We then provide hypotheses and discuss our findings.

2.1 Main Experimental Design

The basic structure of our main experimental design consisted of two stages. In Stage 2, we measured the willingness to trust others using a standard trust game. In Stage 1, subjects were randomly exposed to experiences based on a real effort task.[8] We employed a simple 2×2 design. In the first dimension, we exogenously vary exposure to *negative* versus *positive* experiences: subjects were paid for their work in the real effort task (positive experience) or not (negative experience). In the second dimension, we exogenously vary whether subjects' experiences are caused by an unrelated third party (*social* treatment) or by a random choice device (*non-social* treatment). A difference-in-differences analysis comparing experience effects between the social and the non-social treatment allows us to identify *causal social* experience effects on individuals' willingness to trust.

2.1.1 Stage 1 - Social Treatment

In the social treatment, subjects were randomly assigned to distinct roles—dictator, trustor, and trustee. In the first stage of the social treatment, dictators and trustors participated in a production dictator game. In the second stage, trustor and trustee played a trust game. Thus, only the trustors participated in both stages, and they constitute our group of interest. Trustors knew that subjects in the role of the dictator and the trustee subjects only participated in one of the two stages and that they knew nothing about the game they did not participate in.

[8] There was no time lag between the two stages, i.e., stage 2 followed directly after stage 1.

In the production dictator game (DG), the dictators and the trustors were paired randomly in groups of two. Within each group, both subjects worked on a real-effort task. The real-effort task required subjects to type multiple combinations of letters and numbers, for instance, Ldh24tHuixY5Th21o7FzTT35, into the keyboard. Subjects had as much time as they needed to correctly type 10 different combinations. Completing the real-effort task generated €5, respectively, that were stored in a joint virtual account.

The dictators could then choose to keep the entire amount of money in the account (€10) for themselves or split it evenly with the other subject (the trustor). Thus, depending on the dictator's decision, the trustor either received €5 or no payment at all. The task was deliberately simple and all subjects completed it. That way, in Stage 1 we exposed all trustors to either a positive or negative experience.

We decided to implement a real-effort task where both the dictator and the trustor had to work equally hard to jointly generate €10, because we wanted to make the social norm of sharing equally very salient. Based on this norm, we define receiving no money from the dictator in the production dictator game as a negative social experience, and obtaining €5 as a positive social experience.[9]

In terms of procedures, it is important to note that trustors were randomly matched with a group of dictators that had already made their decisions in earlier experimental sessions.[10] In this group of dictators, exactly half chose the equal split and the other half kept everything for themselves. After the trustors were informed whether their dictator shared equally or not, they learned the actual distribution with which trustors in the experiment received the €5 payment or not. Thus, they learned that in 50% of all cases, trustors received the €5 payment and in 50% of all cases, trustors received no payment. That way, we designed the experience of positive and negative social interactions to contain no objective information about the distribution of "selfish" and "unselfish" subjects in the pool. Hence, rational trustors should hold identical beliefs about the likelihood to encounter "unselfish" or "selfish" subjects later on in the experiment, regardless of the nature of their prior social interaction in Stage 1. In other words,

[9] Arguably, trustors that do not receive their fair share of the produced €10 are likely to perceive this as a negative social interaction, as has been found in numerous previous studies on the (production) DG (for instance, Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000; Konow, 2000; Falk and Fischbacher, 2006; Cappelen, Hole, Sørensen and Tungodden, 2007; Andreoni and Bernheim, 2009; Krupka and Weber, 2013).

[10] This allowed us to present the distribution of dictator decisions to all trustors in the social treatment. At the same time, since dictators made their allocation decisions before being matched with a trustor, emotional/physiological responses may be different than in case the dictator allocations were made after dictators and trustors were matched, see, e.g., Aimone and Houser (2012). Therefore, this design feature may imply that we underestimate the effect of social experiences.

we rule out rational learning from experiences as a driver of experience effects in our setting.

2.1.2 Stage 1 - Non-social Treatment

In the non-social treatment we removed the social component of the experience in Stage 1, keeping everything else constant. Specifically, instead of having trustors work on the real effort task with a dictator, who then decided whether trustors were paid for the real-effort task, trustors in the non-social control condition worked on the real effort alone and were paid based on a random choice device. This random device was programmed based on dictator behavior in the social condition. After subjects learned the outcome of their random draw, they also learned the actual probabilities of the random device (50-50).[11]

Notice that we kept the potential for income effects and pay-related mood or disappointment effects constant between the treatments. After all, trustors provided the same effort in the social and non-social treatment, and in both treatments only half of the trustors received a payment for the exerted effort. The only difference between the conditions was the social aspect of the Stage-1 experience, i.e., the social origin of the experience and the social comparison with the dictator. Thus, a comparison of experience effects on trust between the social and the non-social treatment allows us to isolate the net effect of *social* experiences.[12]

2.1.3 Stage 2 - Trust Game

Stage 2 did not differ between the social and the non-social treatment. We measured subjects' willingness to trust and elicited their beliefs about the trustworthiness of others.

[11] Notice that by design the social treatment might contain more information about prevailing social norms or average levels of altruism in society compared to the non-social treatment, because subjects learn about the distribution of dictator behavior. While this type of learning could in principle create level differences of trust between the social and non-social condition, it cannot explain experience effects on trust.

[12] The net effect of our social experiences consists of two conceptually separate factors. Potential social-experience effects may rely on the fact that the positive or negative experience was caused by another person rather than by nature. On the contrary, potential social-experience effects may rely on the fact that they imply unfavorable or equalizing social comparisons in Stage-1 payments with respect to the dictator subjects. While comparing the main social treatment with the main non-social treatment tests the net effect of these two different factors of social-experience effects, we investigate the separate role of them in our robustness treatments in Section 3.

Willingness to Trust: In the trust game (TG), trustors and trustees were randomly paired in groups of two. Within each group, both subjects were endowed with €5. In a sequential setup, the trustor could first send any amount between €0 and €5 (in 10-cent intervals) to the second-mover subject (the trustee). The amount received by the trustee was doubled. The trustee then decided how much money to send back.[13] The amount sent by the trustor measures their willingness to trust and will be our outcome of interest.

Beliefs about Trustworthiness: We elicited the trustors' beliefs about the trustworthiness of the trustees after we measured their willingness to trust. We asked subjects' the average amount trustees send back in case a trustor sent €1, €3, and €5.[14]

2.1.4 Procedures

Our main treatments were conducted in the BonnEconLab at the University of Bonn and were computerized using softwares z-Tree, ORSEE, and BoXS (Fischbacher, 2007; Greiner, 2004, and Seithe, 2012). In total, 258 subjects participated in the social treatment (96 dictators, 96 trustors and 96 trustees), and 182 subjects participated in the non-social treatment (91 trustors and 91 trustees).[15] Average earnings were €8.50 for trustors, €11.50 for dictators, and €11.10 for trustees.

2.2 Hypotheses

We hypothesize that trustors display an increase in willingness to trust others after positive social experiences, compared to negative social experiences. We expect no such effect for non-social experiences.

Delving into the nature of these effects, we hypothesize that they are driven by non-standard learning patterns that affect subjects' beliefs about the trustworthiness of others.[16] Such a belief account could stem from the cognitive underpinnings of

[13]The trustees could send back any amount between between €0 and the sum of their endowment and the doubled amount sent to them by the first movers. For instance, if a trustor sent €5, the trustee could send back any amount between €0 and €15. In case a trustor sent 50 cents, the trustee could send back any amount between €0 and €6. We used the strategy method to elicit the behavior of the trustees (Selten, 1965; Brandts and Charness, 2000, 2011).

[14]We incentivized trustors by paying €0.50 for each time their guess was within the €0.20 range of the correct answer.

[15]Because of software malfunction, data are missing for a single trustor of the main social treatment.

[16]Recall that by design, we rule out rational learning, since all trustors in the social treatment knew the frequency with which dictators paid or did not pay trustor subjects. Therefore, irrespective of their individual experience, all trustors obtained the same objective information from Stage 1.

belief formation processes. Specifically, akin to accounts in Gennaioli and Shleifer (2010) and Bordalo et al. (2016), when trustors contemplate about whether or not to trust, recent encounters with other individuals in somewhat similar situations may easily come to mind and affect the belief formation process, even if these encounters are not informative from a rational perspective. Arguably, the personal experiences of the trustors in Stage 1 of the social treatment will be directly available to them. For trustors with negative social experiences in Stage 1, selfish behavior will likely be very salient. Analogously, fair behavior may be particularly salient to trustors with positive social experiences in Stage 1. At the same time, the non-social experiences of trustors in the non-social treatment presumably are less likely to come to mind when facing the trust decision in Stage 2, since these experiences might not be associated with fair or unfair behavior, but rather with good or bad luck. We hence do not expect an equally strong effect on trust between non-social positive and non-social negative experiences. Alternatively, non-standard belief patterns could arise from mood effects. Evidence from psychology shows that momentary changes in mood may (albeit modestly) affect optimism and pessimism (Lewis, Dember, Schefft and Radenhausen, 1995). Such a mood-based account of belief formation hinges on whether social experiences in Stage 1 differentially affect mood, while non-social experiences in Stage 1 do not (or less so).

Hypothesis 1. *Subjects display a greater willingness to trust following positive experiences compared to prior negative experiences. Subjects show no such effect after non-social experiences.*

Hypothesis 2. *Subjects expect to receive a greater return of entrusting money after a positive social experience compared to a negative social experience. Subjects show no such effect after non-social experiences.*

2.3 Main Results

First, we look at results separately for the social and the non-social treatment. Then, we compare experience effects between the treatments in a difference-in-differences analysis in order to cleanly identify causal effects of *social* experiences on trust.[17] In

[17]Importantly, in the following we will not simply compare the social treatment and the non-social treatment given a specific experience, since trustors in the social treatments not only make an social experience, but also receive information regarding the distribution of dictator decision, which may seem indicate of trustees' behavior in the trust game. We hence employ a difference-in-differences analysis, in which we can control for information regarding the dictator decisions within the social treatments.

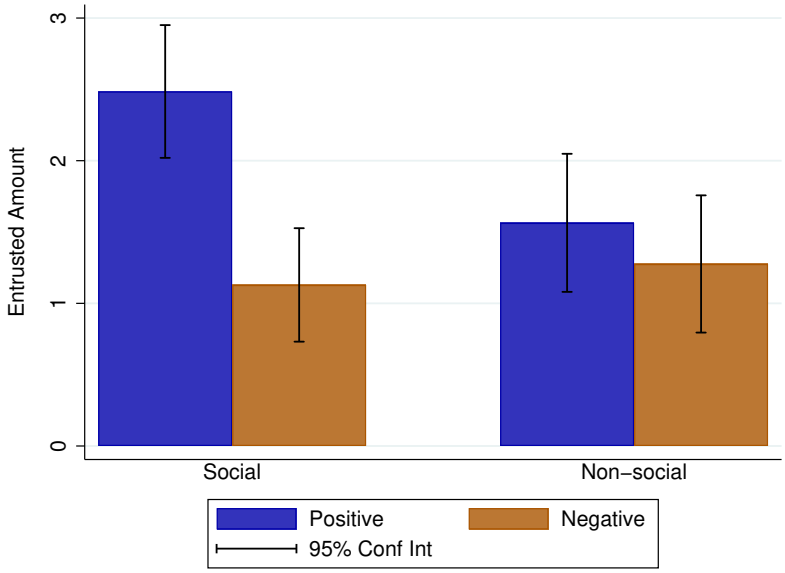

Figure 1: Means of entrusted amounts per treatment for the social (left panel) and non-social (right panel) treatment.

a final step, we delve into the mechanisms underlying the social-experience effects on trust.

2.3.1 Results on Trust Behavior

Figures 1 and 2 capture our main results. Figure 1 shows the average entrusted amounts for the social treatment (two bars on the left) and the non-social treatment (two bars on the right), separated by positive experiences and negative experiences. Figure 2 presents the corresponding distributions.

Figure 1 reveals that trustors that made a positive social experience in Stage 1 sent on average about half of their endowment (€2.49) to the second mover in the trust game, while trustors that made a negative social experience sent less than a quarter of their endowment (€1.13). This difference in trust is substantial and significant (see Columns (1) and (2) of Table 1).[18] A comparison of the distributions of entrusted amounts of money (see the upper panels of Figure 2) confirms this result. Trustors entrust larger amounts more frequently after positive than negative experiences in the social treatments.[19]

[18] P-values reported in this paper always refer to two-sided tests.

[19] Non-parametric Mann–Whitney U and Kolmogorov–Smirnov tests confirm this result and yield P-values below 0.001.

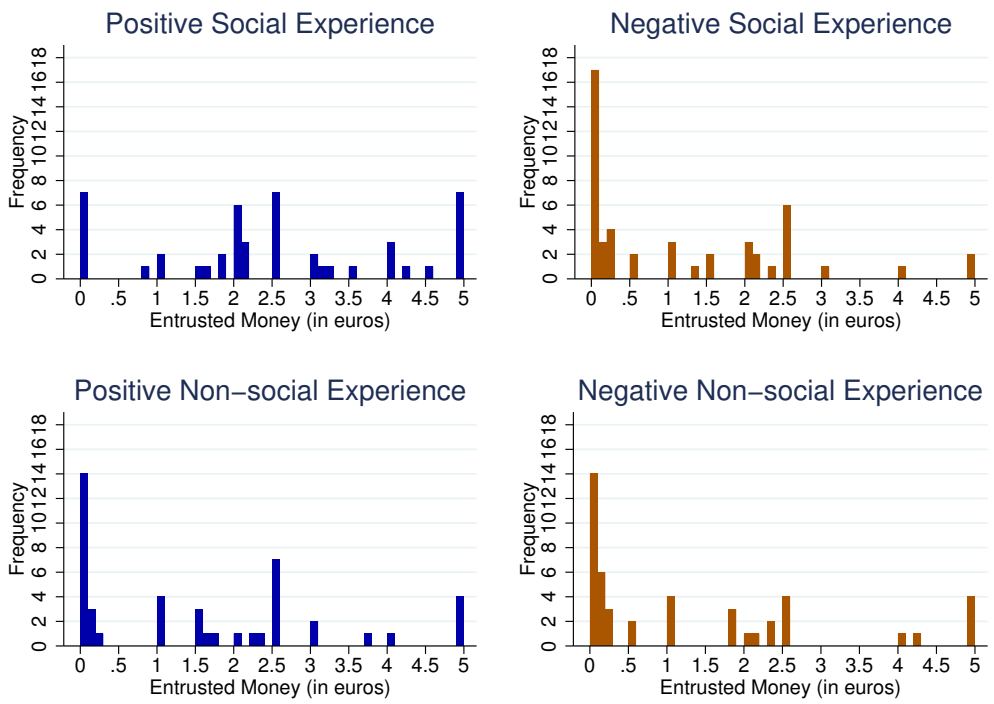

Figure 2: Entrusted Amounts in the Social and Non-social treatments, separately for positive (lower panel) and negative (upper panel) experiences in Stage 1.

Result 1. *Subjects display a greater willingness to trust following positive experiences in prior positive social interactions, compared to prior negative experiences.*

Turning to the non-social treatment, Figures 1 and 2 reveal that trustors sent fairly similar amounts of money to their respective trustees, irrespective of whether they made a positive or negative non-social experience in Stage 1. Specifically, trustors that were exposed to a negative non-social experience in Stage 1 sent on average €0.29 less compared to those that were lucky and got paid in Stage 1. This treatment effect is not statistically significant (see columns (3) and (4) of Table 1). The distributions of entrusted amounts of money reveal very similar trust behavior between the negative and positive non-social experience treatments (see Figure 2).[20]

In order to flesh out the social aspect of experience effects properly, we compare the social and non-social-experience effects in a difference-in-differences linear regression (see Columns (5) and (6) of Table 1). The corresponding coefficient of the interaction is negative and significant in both specifications, establishing our main finding: personal

[20]Similarly, employing Mann–Whitney U and Kolmogorov–Smirnov tests—which yield P-values of 0.4527 and 0.737, respectively—we do not find support that they differ significantly.

Table 1: Comparing Experience Effects on Trust between Social and Non-social Treatments

	OLS: Entrusted Amount					
	Social Treatment		Non-social Treatment		Diff-in-Diff Analysis of Social and Non-social	
	(1)	(2)	(3)	(4)	(5)	(6)
1 if Pos. Exp.	1.36***	1.35***	0.29	0.29	1.36***	1.33***
	(0.30)	(0.31)	(0.34)	(0.35)	(0.30)	(0.31)
1 if Non-social					0.15	0.11
					(0.31)	(0.33)
1 if Pos. & Non-social Exp.					−1.07**	−1.04**
					(0.46)	(0.46)
1 if Female Gender		−0.09		−0.34		−0.22
		(0.39)		(0.38)		(0.27)
Age & IQ Controls		Yes		Yes		Yes
Constant	1.13***	1.18***	1.28***	1.47***	1.13***	1.29**
	(0.20)	(0.41)	(0.24)	(0.32)	(0.20)	(0.32)
Observations	95	95	91	91	186	186
(Adjusted) R^2	0.18	0.14	0.00	−0.03	0.09	0.08

In Columns (1) and (3), we regress trust on a condition dummy (= 1 for positive experience) for the social and the non-social treatment, respectively. Columns (2) and (4) show the former regressions when adding individual controls—gender, age and a proxy for IQ. In Columns (5) and (6), we regress the expected return on an experience dummy (= 1 for positive experience) and a treatment dummy (= 1 for the non-social treatment) and an interaction variable between the two dummies. Robust standard errors in parentheses. Significant at the 1 (5) [10] percent level: *** (**) [*].

experiences of *social* interactions causally affect subjects' willingness to trust beyond non-social negative or positive experiences.

Result 2. *The experience effects on trust in the social treatment is significantly larger compared to the non-social treatment.*

Taken together, our results reveal specific causal experience effects on trust and provide evidence for Hypothesis 1. Prior exposure to social interactions shapes subjects' willingness to trust others. These experience effects are specific in the sense that they can be cleanly traced back to social factors. In the next section we analyze the underlying mechanisms of these findings. In Appendix A we examine who benefits from the efficiency gains that result from higher trust after positive social experiences.

2.3.2 Results on Beliefs

Our results provide clean evidence that personal experiences of prior social interactions are an important determinant of individuals' willingness to trust others. Result 2 implies that this effect cannot be due to income effects, pay-related mood, disappoint-

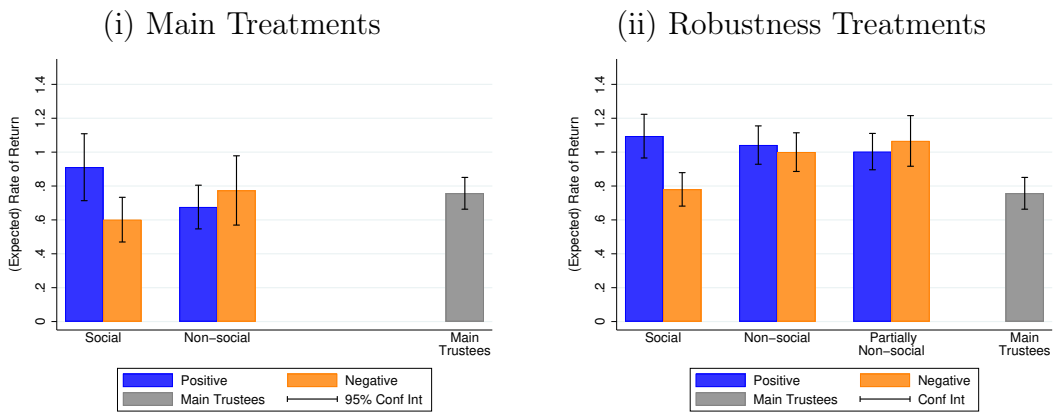

Figure 3: The left panel depicts the means of average expected rate of returns for the social treatment and the non-social treatment, separately for positive and negative experiences in Stage 1, in comparison to the actual rate of return. The right panel depicts the means of average expected rate of returns for all robustness treatments, which we discuss in detail in Section 3.

ment or reference-dependence effects, as such alternative explanations would also have predicted experience effects in the non-social treatment.

In the following, we focus on Hypothesis 2, in which we predict that non-standard beliefs serve as a channel through which social-experience effects operate.[21] In the context of the experimental set-up described in Section 2.1, we investigate such a non-standard belief channel by considering trustors' beliefs about the trustworthiness of trustees, i.e., how much money they expected trustees to send back on average in case €1, €3, and €5 were sent.[22] For each belief, we compute the expected rate of return and then compare the average expected rate of returns between our treatments.[23] We thus have three expected rate-of-return measures for each trustor in our sample. Figure 3 (left panel) shows the means of the average expected rate of returns per treatment cell (as well as the actual returned amounts of trustees).

Trustors' beliefs seem to differ substantially between negative and positive experi-

[21]Recall that by design, Result 2 cannot be explained by rational learning, since all trustors in the social treatment knew the frequency with which dictators paid or did not pay trustor subjects. Therefore, irrespective of their individual experience, all trustors obtained the same objective information from Stage 1. To further substantiate this point, we actually asked trustors at the end of the experiment whether they still recall the frequencies with which dictator subjects paid or did not pay trustors in Stage 1: We find that 84 out of 95 trustors recalled the correct frequencies at the end of the experiment and that our results are robust to including only these 84 subjects who correctly recalled the frequencies (see Appendix A).

[22]Beliefs are rather well-calibrated. Mean beliefs of trustors across all treatments are fairly similar to the actual mean amounts trustees intended to send back (see Figure 5 in Appendix A). In addition stated beliefs are positively associated with actual behavior (see Table 7 in Appendix A).

[23]Instead of looking at the average rate of returns, in Appendix A we also look at disaggregated measures as suggested by Butler, Giuliano and Guiso (2015).

Table 2: Comparing Experience Effects on Beliefs between Social and Non-social Treatments

	OLS: Expected Rate of Returns					
	Social Treatment		Non-social Treatment		Diff-in-Diff Analysis of Social and Non-social	
	(1)	(2)	(3)	(4)	(5)	(6)
1 if Pos. Exp.	0.31**	0.30**	−0.10	−0.08	0.31***	0.30**
	(0.12)	(0.12)	(0.12)	(0.11)	(0.12)	(0.12)
1 if Non-social					0.17	0.17
					(0.12)	(0.13)
1 if Pos. & Non-social Exp.					−0.41**	−0.39**
					(0.17)	(0.16)
1 if Female Gender		−0.10		−0.10		−0.11
		(0.14)		(0.11)		(0.09)
Age & IQ Controls		Yes		Yes		Yes
Constant	0.60***	0.68***	0.77***	0.83***	0.60***	0.67***
	(0.07)	(0.14)	(0.10)	(0.11)	(0.07)	(0.10)
Observations	285	285	273	273	558	558
Clusters	95	95	91	91	186	186
Adjusted R^2	0.04	0.05	0.01	0.02	0.03	0.03

In Columns (1) and (3), we regress the expected rate of return on a condition dummy (= 1 for positive experience) for the social and the non-social treatment, respectively. Columns (2) and (4) show the former regressions when adding individual controls—gender, age and a proxy for IQ. In Columns (5) and (6), we regress the expected rate of return on an experience dummy (= 1 for positive experience) and a treatment dummy (= 1 for the non-social treatment) and an interaction variable between the two dummies. Robust standard errors in parentheses. Clusters on the individual level. Significant at the 1 (5) [10] percent level: *** (**) [*].

ences in the social treatment, while they do not differ much for the non-social treatment.[24] After a negative experience in the social treatment, trustors' average expected rate of return is €0.60. It is €0.91 after the corresponding positive experience. This difference of €0.31 is significantly different from zero in an OLS regression of the expected rate of returns on an experience dummy, see Columns (1) and (2) of Table 2. Thus, trustors are substantially less optimistic about the others' trustworthiness after a negative than a positive social experience.[25] We find a much smaller difference with the opposite sign for the non-social treatment: Trustors' average expected rate of return is €0.77 after a negative experience and €0.68 after a positive experience in the non-social treatment. This difference is not significantly different from zero in an OLS regression, see Columns (3) and (4) of Table 2.

To complete our corresponding analysis, we compare the experience effects on beliefs

[24] This pattern also emerges when looking at the expected amounts returned by trustees for each individual belief measure, see the upper three panels of Figure 6 in Appendix A.

[25] Again, notice that this holds despite the fact that subjects obtained the same objective information in both conditions regarding the frequency with which dictators shared money in Stage 1.

between treatments. We find that the experience effect on beliefs in the social treatment is significantly larger than that in the non-social treatment (see Columns (5) and (6) of Table 2). This implies that social experiences, as opposed to non-social experiences, seem to have specific, non-standard effects on beliefs about others' trustworthiness.

Result 3. *The experience effects on trustors' expected rate of return of entrusting money in the social treatment is significantly larger than in the non-social treatment.*

3 Robustness

The previous section presented evidence for social-experience effects on trust: trustors' willingness to trust others is shaped by recent unrelated social experiences; such social-experience effects appear to be caused—at least partly—by non-standard effects on subjects' beliefs.

In this section, we highlight the robustness of our results by using a tweaked version of our main experimental set-up that implements changes along the following dimensions: (i) Instead of letting subjects participate in an actual trust game in Stage 2, subjects solely state their beliefs about the trustworthiness of others. This allows us to substantiate the non-standard belief channel behind our social-experience effects. (ii) We added a new control condition (called partially non-social) that allows us to discriminate whether our social-experience effects are driven by social-comparison effects or by the fact they were caused by another person rather than by nature. (iii) We altered several minor design features to test for procedural robustness and rule out alternative explanations for our findings.

3.1 Design of Robustness Treatments

In our robustness treatments, we employed a 2 (positive vs. negative) $\times$ 3 (social vs. non-social vs. partially non-social) factorial design. As in our main treatments, each robustness treatment consists of two stages. In Stage 2 of all robustness treatments, we focused on measuring subjects' beliefs about the trustworthiness of others, as is discussed in detail below. In Stage 1, subjects were randomly exposed to positive or negative experiences. In the social and non-social treatments, Stage 1 remained unchanged with respect to our main social and non-social treatments. However, we added a second type of control treatment (partially non-social) in which Stage 1 differs from both the social and non-social treatments, as is discussed in detail below.

3.1.1 Stage 1 - Social and Non-social Treatment

Stage 1 remained unchanged for the social and non-social treatments, with the exception that this time 44% of dictators decided to split the €10 evenly, while 56% of dictators decided to keep the €10 for themselves in the social treatment. The computer of the non-social treatment was hence programmed to pay €5 with probability 44% and pay nothing with probability 56%. Additionally, we changed the timing in the robustness treatments. While trustors in the main treatments learned the distribution that generates experiences (i.e., the distribution of dictator decisions) at the end of Stage 1, subjects in all robustness treatment now learned the distribution at the beginning of Stage 1.

3.1.2 Stage 1 - Partially Non-social Treatment

In Stage 1 of the partially non-social treatment, our subjects of interest were randomly assigned to a peer subject. Within each group, both subjects worked on the real-effort task used in Stage 1 of the social treatment. Upon completing the task, both subjects contributed €5 that were stored in a joint virtual account. The computer then randomly choose whether the peer subject received the entire €10 or whether the amount was split evenly between both subjects.

Recall that two aspects of the social experience could drive our findings, the social nature of the source that generates the experience, or the "shared" nature of the experience which implied potential for unfavorable social comparisons. The partially non-social treatment allows us to separate between the two aspects. It combines elements of our social and non-social treatment. The partially non-social treatment was non-social in the sense that the computer continues to randomly decide whether our subjects of interest were paid for their work on the real-effort task or not, i.e. whether Stage 1 constitutes a positive or a negative experience for them. But it was social in the sense that a peer subject was present that would conversely benefit from the allocation decision (of the computer). In that way the peer subjects resemble the dictators of the social treatment and unfavorable or equalizing social comparisons in Stage-1 payments were present.

The partially non-social treatment hence resembles the social treatment in all but one feature: the allocation decision is conducted by nature rather than by a dictator subject. We can therefore directly test whether the driving factor of the social experience effect is that another person generates the experience (i.e., makes the allocation decision).

3.1.3 Stage 2

We explained the trust game conducted in Stage 2 of the main treatments to our subjects of interests. However, subjects did not actually play the trust game. Instead, we asked subjects to state their beliefs about how much the trustees in these situations send back on average in case a trustor sent €1, €3, and €5. Beliefs were incentivized for accuracy using a quadratic scoring rule.[26] Thus, in the robustness treatments we focus entirely on beliefs about the trustworthiness of others, ruling out hedging motives and other potential spillovers between behavior and beliefs.

3.1.4 Procedures

Our robustness treatments were conducted in the BonnEconLab at the University of Bonn and were computerized using softwares ORSEE, and Qualtrics. In total, 616 subjects participated in the social and partially non-social treatments (308 subjects of interest and 308 dictators/peer subjects) and 154 subjects participated in the non-social treatment. Since none of the socio-demographics we collected for our main treatments had empirical bite, we refrained from eliciting them for the robustness treatments.[27] Average earnings were €9.37 for trustors and €11.79 for dictators.

3.2 Results of Robustness Treatments

Mirroring our analysis of subjects' beliefs in our main treatments, we compute the expected rate of return for each individual belief measure and then compare the average expected rate of returns between our robustness treatments. Figure 3(ii) shows the means of the average expected rate of returns per treatment cell (as well as the actual rate of return of trustees).

Consistent with our previous findings, subjects' beliefs seem to differ substantially between negative and positive experiences in the social treatment, while they do not differ much for the non-social treatment as well as the partially non-social treatment.[28] After a negative experience in the social treatment, subjects' average expected rate of return is almost €0.80 and it is almost €1.10 after the corresponding positive experi-

[26] We used trustee behavior from our main treatments. One of the three beliefs subjects stated was randomly selected for payment. A quadratic scoring rule determined subjects' payment based on how their stated belief, sb, compared to the actual mean behavior of second movers in the main treatments, ab, according to the following formula: $4 - \frac{1}{2}(ab - sb)^2$.

[27] We chose a larger sample size for the robustness treatments, because we worried that the pure belief measures (where subjects don't actually play the game) might be more noisy.

[28] This pattern also emerges when looking at the expected amounts returned by trustees for each individual belief measure, see the lower three panels of Figure 6 in Appendix A.

ence. This difference of €0.31 is significantly different from zero in an OLS regression of the expected rate of returns on an experience dummy, see Column (1) of Table 3. In other words, subjects are substantially less optimistic about the others' trustworthiness after a negative than a positive social experience—even though subjects obtained the same objective information in both conditions regarding the frequency with which dictators shared money in Stage 1. We find a much smaller difference for the non-social treatment. Comparing the experience effects on beliefs between the social and the non-social treatments, we find that the experience effect on beliefs in the social treatment are significantly larger than that in the non-social treatment, see Column (4) of Table 3. We thus replicate our findings from the main treatments.

Turning to the partially non-social treatment, Column (3) of Table 3 reveals that it does not generate a significant experience effect. Comparing effect sizes with the social treatment, we find that the experience effect on beliefs in the social treatment is significantly more pronounced, see Column (5) of Table 3. This implies that the social-experience effects seem to be driven by the fact that the negative and positive experiences were generated by another human being, and are not driven by social comparison effects (i.e., the shared payoff experience with another subject).

Result 4. *The experience effects on subjects' expected rate of return in the social treatment is significantly larger than in the non-social treatment as well as the partially non-social treatment.*

4 Discussion of Results

The previous two sections presented evidence on social-experience effects on trust behavior and beliefs about the trustworthiness of others. These results cannot be explained by rational learning, income effects, pay or social comparison related mood, disappointment aversion and expectations-based or social reference points, as we kept potential effects based on these motives constants between our social treatments and non-social control conditions.

Previous research has demonstrated that trust behavior is reducible to two individual primitives: beliefs about the trustworthiness of others (Costa-Gomes et al., 2014) as well as preferences with respect to social risk taking (Bohnet and Zeckhauser, 2004), outcomes of others (Cox, 2004; Ashraf et al., 2006) and actions of others (Stanca, 2009).[29] While we identified the non-standard belief channel as an important driver of

[29]This dichotomy is not exhaustive. For instance, beliefs regarding norms and/or moral values may be important driver of trust (Butler, Giuliano and Guiso, 2016).

Table 3: Comparing Experience Effects on Beliefs for the Robustness Treatments

	OLS: Expected Rate of Returns				
	Social Treatment	Non-social Treatment	P Non-social Treatment	Diff-in-Diff: Social vs. Non-social	Diff-in-Diff: Social vs. P Non-social
	(1)	(2)	(3)	(4)	(5)
1 if Pos. Exp.	0.31***	0.04	−0.06	0.31**	0.31***
	(0.08)	(0.08)	(0.09)	(0.08)	(0.08)
1 if (P) Non-social				0.21***	0.29***
				(0.08)	(0.09)
1 if Pos. & (P) Non-social Exp.				−0.27**	−0.38***
				(0.11)	(0.12)
Constant	0.78***	1.00***	1.06***	0.78***	0.78***
	(0.05)	(0.06)	(0.08)	(0.05)	(0.05)
Observations	462	462	462	924	924
Clusters	154	154	154	308	308
Adjusted R^2	0.05	0.00	0.00	0.03	0.03

In Columns (1), (2), and (3), we regress the expected rate of return on a condition dummy (= 1 for positive experience) for the social, the non-social, and the partially non-social treatment, respectively. In Columns (4) and (5), we regress the expected rate of return on an experience dummy (= 1 for positive experience) and a treatment dummy (= 1 for the non-social treatment and the partially non-social treatment, respectively) and an interaction variable between the two dummies. Robust standard errors in parentheses. Clusters on the individual level. Significant at the 1 (5) [10] percent level: *** (**) [*].

our social-experience effects, in the following we discuss complementary accounts that may have also contributed to the sizable social-experience effects on trust behavior in our main treatments. Table 4 provides suggestive evidence that non-standard beliefs are not the sole driver of social-experience effects on behavior. In Column (1), there remains a significant effect of social experiences on trustors' willingness to trust in the main treatments, even after controlling for beliefs about the trustworthiness of others.

Betrayal Aversion Trusting others is a risky endeavor. Bohnet and Zeckhauser (2004) have shown that individuals' willingness to trust others is characterized by betrayal aversion (rather than plain risk aversion). Betrayal aversion might have contributed to our findings if positive and negative unrelated social experiences differentially affect individuals' attitudes towards betrayal. Bohnet, Herrmann and Zeckhauser (2010) provide suggestive evidence for such a relationship. Bohnet et al. (2010) find that Gulf residents demand higher trustworthiness to trust anonymous trustees than Western residents. Bohnet et al. (2010) argue that this could be explained by differences in reference points of trustworthiness, which result from differences in accustomed levels of trustworthiness. Betrayal aversion is stronger, the further believed trustworthiness

Table 4: The effect of Social Experiences on Trust in the Main Treatments

	OLS: Entrusted Amount	
	Positive Experience	Negative Experience
	(1)	(2)
1 if Social	0.70**	−0.03
	(0.32)	(0.74)
Average Expected Rate of Return	0.96***	0.70**
	(0.22)	(0.34)
Constant	0.92***	0.73**
	(0.28)	(0.33)
Observations	92	94
Adjusted R^2	0.18	0.08

We regress the entrusted amount on a social treatment dummy (=1 if social treatment, =0 if non-social treatment) and average expected rate of return, separately for the positive experience (Column 1) and negative experience (Column 2). We state robust standard errors in parentheses. Significant at the 1 (5) [10] percent level: *** (**) [*].

is deviating from the reference point of trustworthiness.[30] Therefore, Gulf residents anticipate betrayal aversion for lower trustworthiness than Western residents, which decreases their willingness to engage in trusting others.

Indirect Reciprocity Another potential mechanism that might have added to the effect on trusting behavior is indirect reciprocity (Nowak and Sigmund, 2005; Stanca, 2009). Generalized indirect reciprocity (Stanca, 2009) predicts that kind and unkind treatment by someone may be reciprocated to an unrelated third party. In our context, Stage 1 induces experiences of kind and unkind social interactions, depending on treatment. Trustors may indirectly reciprocate their Stage 1 experience by sending a lower amount to the trustee after unkind social interactions rather than kind ones.

Other-regarding Preferences Cox (2004); Ashraf et al. (2006) have shown that trust behavior is partly driven by individuals' altruism regarding the outcomes of others. Our social-experience effects could have been reinforced by altruism if the following

[30] While Gulf residents may develop trust primarily between family members, their reference point of trustworthiness regarding strangers is relative large. Western residents in turn produced trust because of formal rules, such as contract law, which accustomed them to a relatively low reference point of trustworthiness.

holds: Individuals' altruism changes differentially between the positive and negative social experiences—even if those are caused by an unrelated third party; Negative unrelated social experiences lead trustors to care less for the outcome of their trustee and positive unrelated social experiences result in trustors caring more for the outcome of their trustee.

5 Conclusion

Our results show a substantial effect of personal experiences from negative versus positive social interactions on the willingness to trust others. Findings from a non-social control condition reveal that the social aspect of experiences is a key driver of our results. Delving into the underlying mechanisms, our findings suggest that experience effects on trust operate via non-standard belief patterns, where experiences shape beliefs about the trustworthiness of others. We document robustness of our results by replicating our findings in additional treatment variations.

These findings provide a first step to uncover the pronounced heterogeneity of trust within given institutional settings that the literature has identified, by underscoring the importance of past experiences as a driver of differences in individuals' willingness to trust. Our results also relate to the literature on experience effects more broadly by emphasizing the crucial role of *personal* experiences as well as by identifying beliefs as a crucial mediator of experience effects. Furthermore, based on our findings, policy makers and workplace designers who are interested in promoting trust should keep spillover effects from unrelated personal experiences in mind. By encouraging fairness between individuals, trust may be fostered as a welcomed side effect and virtuous circles may be initiated.[31]

An important open question is to what extent our results generalize to other settings. We think of our experimental investigation mainly as providing clean qualitative proof of concept type of evidence. While our results have proven to be robust to variations in the experimental design, we can only speculate about likely effect sizes in other contexts. For instance, one might argue that we probably underestimate real-life social-experience effects, simply because real life experiences tend to be more important and meaningful than the social experience we create in the lab. At the same, one could argue the opposite, because the social experience in the lab is very salient,

[31] However, one should be cautious, as trust may be promoted in situations that lead to exploitation. In our TG, for instance, first movers who experienced fair treatment earned 54 Cents on average less than first movers who experienced unfair treatment.

whereas real-life social experiences are maybe more ambiguous and mixed with other events.

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A Treatment Overview, Robustness, and Additional Findings

Table 5: Comparing Experience Effects on Trust between Social and Non-social Treatments - Reduced Sample

	OLS: Entrusted Amount							
	Social Treatment			Non-social Treatment		Difference-in-Differences Analysis of Social and Non-social Treatment		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1 if Pos. Exp.	1.36***	1.35***	1.35***	0.29	0.29	1.36***	1.33***	1.34***
	(0.30)	(0.31)	(0.34)	(0.34)	(0.35)	(0.30)	(0.31)	(0.33)
1 if Non-social						0.15	0.11	0.07
						(0.31)	(0.33)	(0.34)
1 if Pos. & Non-social Exp.						−1.07**	−1.04**	−1.04**
						(0.46)	(0.46)	(0.48)
1 if Female Gender		−0.09	−0.02		−0.34		−0.22	−0.18
		(0.39)	(0.41)		(0.38)		(0.27)	(0.28)
Age & IQ Controls		Yes	Yes		Yes		Yes	Yes
Constant	1.13***	1.18***	1.17***	1.28***	1.47***	1.13***	1.29**	1.30***
	(0.20)	(0.41)	(0.43)	(0.24)	(0.32)	(0.20)	(0.32)	(0.33)
Sample	Full	Full	Partial	Full	Full	Full	Full	Partial
Observations	95	95	84	91	91	186	186	175
Adjusted R^2	0.18	0.14	0.13	0.00	−0.03	0.09	0.08	0.08

In Columns (1) and (4), we regress the entrusted amount on a condition dummy (= 1 for positive experience) for the social and the non-social treatment, respectively. Columns (2) and (3) show the former regression when adding individual controls—gender, age and a proxy for IQ—(2) as well as taking only the sample of subjects who recalled the correct frequency of dictator behavior (3). Column (5) shows the regression of (4) with demographic controls. In Column (6), we regress the entrusted amount on a condition dummy (= 1 for positive experience) and a treatment dummy (= 1 for the non-social treatment) and an interaction variable between the two dummies. In Columns (7) and (8) show the regression of Column (6) when adding demographic controls (7) as well as taking only the sample of subjects who recalled the correct frequency of dictator behavior (8). We state robust standard errors in parentheses. Significant at the 1 (5) [10] percent level: *** (**) [*].

Expected Earnings

Our key result is that positive social experiences enhance subjects' willingness to trust. In the following, we analyze whether trustors benefit from the resulting efficiency gains. In order to assess this, we calculate the expected earnings for each trustor based on their actual willingness to trust and on the average intentions of trustees. Recall that we used the strategy method to elicit trustees' willingness to send back money. That is, trustees stated how much they would send back for each potential amount trustors could have send to them. Figure 4 shows trustees' intended average rate of return for any given entrusted amount. Overall, trustees intended to return less than 75% of what was entrusted to them. This finding is consistent with what studies typically

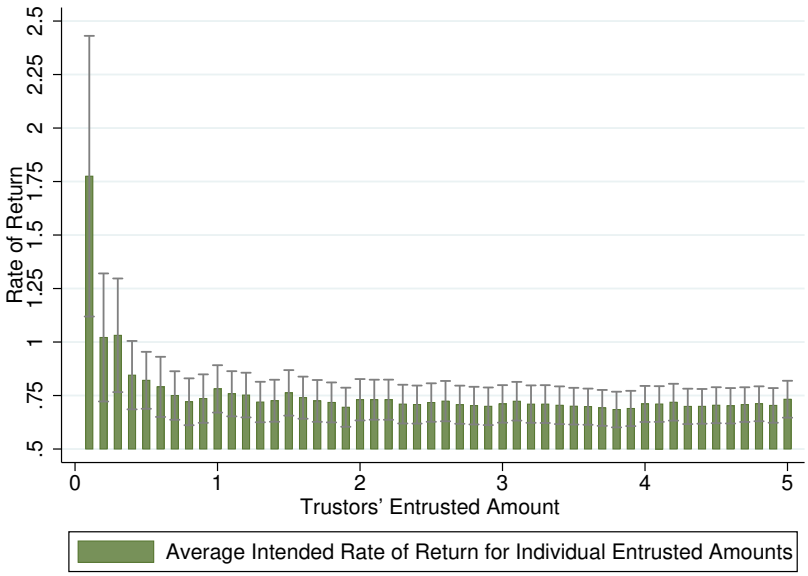

Figure 4: Means of how much trustees intended to send back for each entrusted amount.

Table 6: Comparing Experience Effects on Expected Earnings between Social and Non-social Treatments

	OLS: Expected Earnings					
	Social Treatment		Non-social Treatment		Diff-in-Diff Analysis of Social and Non-social	
	(1)	(2)	(3)	(4)	(5)	(6)
1 if Pos. Exp.	−0.40***	−0.39***	−0.09	−0.09	−0.40***	−0.39***
	(0.09)	(0.09)	(0.09)	(0.10)	(0.09)	(0.09)
1 if Non-social					−0.03	−0.02
					(0.09)	(0.09)
1 if Pos. & Non-social Exp.					0.30**	0.30**
					(0.13)	(0.13)
1 if Female Gender		0.03		0.09		0.06
		(0.11)		(0.11)		(0.08)
Age & IQ Controls		Yes		Yes		Yes
Constant	4.71***	4.69***	4.67***	4.62***	4.71***	4.66***
	(0.06)	(0.11)	(0.07)	(0.10)	(0.06)	(0.09)
Observations	95	95	91	91	186	186
Adjusted R^2	0.18	0.15	0.00	−0.03	0.10	0.09

In Columns (1) and (4), we regress the expected earnings of trustors on a condition dummy (= 1 for positive experience) for the social and the non-social treatment, respectively. Columns (2) and (4) show the former regressions when adding individual controls—gender, age and a proxy for IQ. In Columns (5) and (6), we regress the expected return on an experience dummy (= 1 for positive experience) and a treatment dummy (= 1 for the non-social treatment) and an interaction variable between the two dummies. Robust standard errors in parentheses. Significant at the 1 (5) [10] percent level: *** (**) [*].

find for this type of trust game (see, for instance, Camerer, 2003; Ashraf et al., 2006). Note that for amounts sent to trustees larger than €0.30, their intended rate of return

is essentially flat. Other studies (for instance, Ashraf et al., 2006; Butler et al., 2015) found that rates of return (modestly) increase with amount sent.

Table 7: Relationship Between Trustors' Willingness to Trust and Expected Rate of Returns

	OLS: Entrusted Amount			
	(1)	(2)	(3)	(4)
€1-Belief	0.47***			
	(0.12)			
€3-Belief		0.36***		
		(0.09)		
€5-Belief			0.20***	
			(0.05)	
Average Expected Rate of Return				0.95***
				(0.23)
Constant	1.22***	0.84***	0.92***	0.91***
	(0.15)	(0.20)	(0.20)	(0.19)
Observations	186	186	186	186
Adjusted R^2	0.08	0.12	0.07	0.11

We regress the entrusted amount on beliefs measures. In Column (1), we take the belief how much trustors expected return after €1 was send to them. In Column (2), we take the belief how much trustors expected trustees return after €3 was send to them. In Column (3), we take the belief how much trustors expected trustees return after €5 was send to them. In Column (4), we take the average expected rate of return, which we calculate from all three beliefs questions. We state robust standard errors in parentheses. Significant at the 1 (5) [10] percent level: *** (**) [*].

That is, trustors lost on average money when sending positive amounts to trustees. This finding suggests that personal experiences of positive social interactions lead to lower expected earnings. This is precisely what we find. Positive social experiences significantly reduced trustors' expected earnings by €0.40 relative to negative social experiences, see Columns (1), (2), and (3) of Table 6. This treatment effect is significantly larger than the experience effect in non-social treatment, see Columns (6), (7), and (8) of Table 6. Therefore, the personal experience effect of unrelated social interactions affects not only trustors' willingness to trust, but also their expected outcomes. While positive social interactions decrease expected outcomes of trustors in our experiment—by improving trust towards not trustworthy trustees—, it could well be the case that in different situations—where trustees are substantially more trustworthy—the relationship between positive social interactions and expected outcomes of trustors are positive.

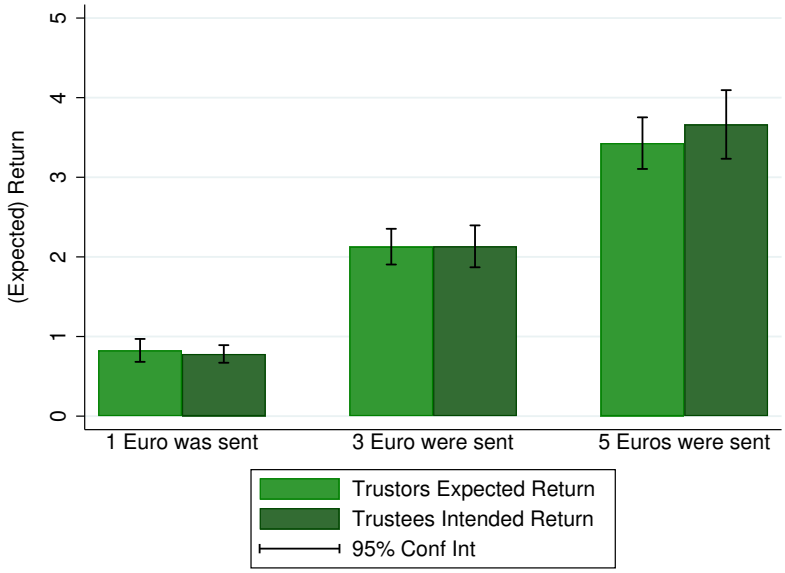

Figure 5: Means of how much trustees intended to send back and of how much trustors expected trustees to send back.

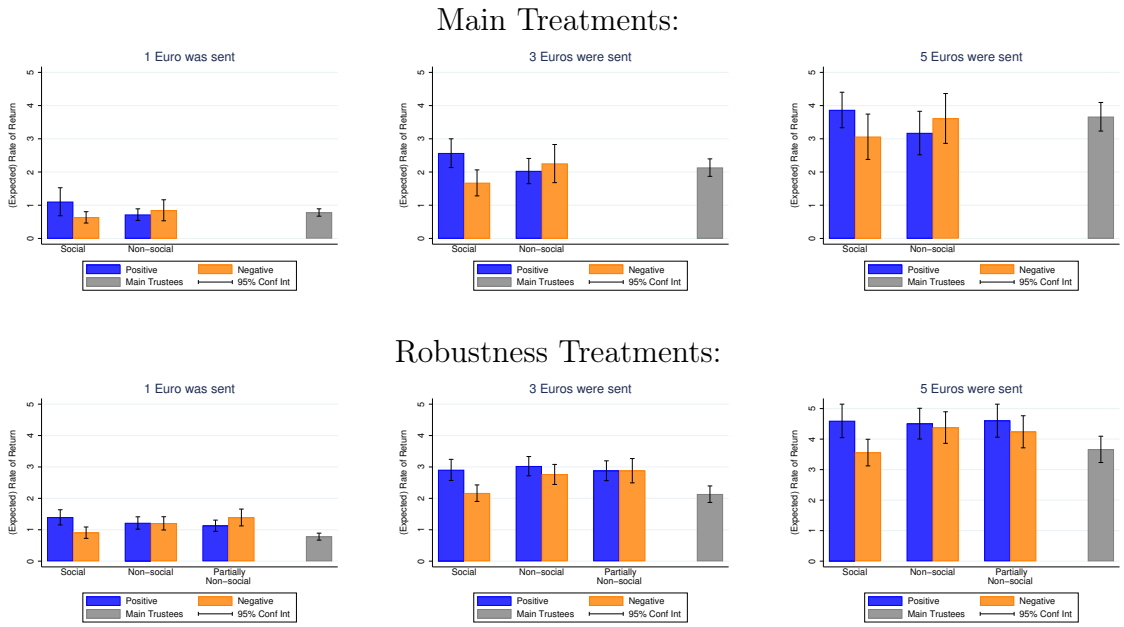

Figure 6: Means of (expected) money send back by trustees. The expected amounts are stated separately for the social and the non-social treatments—separately for positive and negative experiences in Stage 1.

Beliefs

We investigate a non-standard belief channel by considering trustors' beliefs about the trustworthiness of trustees, i.e., how much money they expected trustees send

Table 8: Comparing Experience Effects on Subjects' Baseline Beliefs on Trustworthiness

	OLS: Baseline Beliefs on Trustworthiness					OLS: Expected Reciprocity				
	Main Treatments		Robustness Treatments			Main Treatments		Robustness Treatments		
	Social	Non-social	Social	Non-social	P Non-social	Social	Non-social	Social	Non-social	P Non-social
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1 if Pos. Exp.	0.54**	−0.13	0.52***	0.03	−0.31	−0.08	0.01	−0.07**	0.00	0.08**
	(0.25)	(0.20)	(0.16)	(0.17)	(0.19)	(0.05)	(0.04)	(0.03)	(0.04)	(0.04)
Constant	0.63***	0.87***	0.93***	1.25***	1.47***	−0.01	−0.03	−0.05**	−0.08**	−0.14***
	(0.18)	(0.14)	(0.11)	(0.11)	(0.13)	(0.04)	(0.03)	(0.02)	(0.02)	(0.03)
Observations	95	91	154	154	154	95	91	154	154	154
Adjusted R^2	0.04	0.00	0.06	0.00	0.01	0.02	0.00	0.02	0.00	0.03

In Columns (1), (2), (3), (4), and (5) we regress subjects' baseline beliefs on trustworthiness on a condition dummy (= 1 for positive experience) for all treatments. In Columns (6), (7), (8), (9), and (10) we regress subjects' expected reciprocity on a condition dummy (= 1 for positive experience) for all treatments. Robust standard errors in parentheses. Significant at the 1 (5) [10] percent level: *** (**) [*].

back on average in case €1, €3, and €5 were sent. Beliefs are rather well-calibrated. Mean beliefs of trustors across all main treatments are fairly similar to the actual mean amounts trustees intended to send back, Figure 5. In addition stated beliefs are positively associated with actual behavior, see Table 7. Figure 6 shows subjects' average beliefs for each case, separately for all treatments (main treatments in the upper panels and robustness treatments in the lower panels) and in contrast with trustees intended returned amounts.

We conducted our main analysis on the average expected rate of return per individual. Here, we follow Butler et al. (2015) in computing subjects' baseline trustworthiness and expected reciprocity by estimating the equation $e_i(s) = b_i + r_i a + u_i$ for each individual i, with e denoting the expected rate of return and a the amounts of money that were sent. By running these regressions, we obtain individual-level measures of subjects' baseline beliefs on trustworthiness, $\hat{b_i}$, and expected reciprocity $\hat{r_i}$ (the intercept and slope intercepts, respectively). Consistent with our previous findings, we find significant social-experience effects on subjects' baseline beliefs on trustworthiness and little to no non-social-experience effects on subjects' baseline beliefs on trustworthiness, see Columns (1) to (5) in Table 8: subjects baseline beliefs on trustworthiness are greater after positive social experiences than negative social experiences. We also find that positive social experiences tend to decrease subjects' expected reciprocity, see Columns (6) and (8) in Table 8.