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**Working Paper**

# The Experience Is (Not) Everything: Sequential Outcomes and Social Decision-Making

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# The Experience Is (Not) Everything: Sequential Outcomes and Social Decision-Making

*Johannes Buckenmaier, Eugen Dimant*

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# The Experience Is (Not) Everything: Sequential Outcomes and Social Decision-Making

## Abstract

In multiple pre-registered experiments, we examine the effect of sequences of positive and negative experiences on altruism, trust, trustworthiness, and cooperation. For non-social experiences, we find no effect on subsequent behavior in any of these social domains. However, when experiences are social in nature, we find more cooperation after gains than after losses. For neutral experiences with gains equalizing losses, we find no evidence for a differential effect of experiences irrespective of whether the experience is social or not. Our findings are in line with recent evidence on decision making under risk, showing that the effect of prior experiences depends on task similarity. Beyond that, we extend these findings to various forms of social decision making. Our results suggest that the overall valence of an experience (gain or loss) matters, whereas its dynamic trend (improving or deteriorating) does not.

JEL-Codes: C720, C910, D800, D900.

Keywords: altruism, cooperativeness, sequential decisions, trust.

*Johannes Buckenmaier**
*University of Zurich / Switzerland*
*johannes.buckenmaier@econ.uzh.ch*

*Eugen Dimant*
*University of Pennsylvania*
*Philadelphia / PA / USA*
*edimant@sas.upenn.edu*

*corresponding author

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# 1 Introduction

Past events play a crucial role in determining current economic decisions (Thaler, 1980). The role of such *experience effects* has been studied extensively, particularly within the domain of risky decision-making and financial markets (Andrade and Iyer, 2009; Haisley and Loewenstein, 2011; Malmendier and Nagel, 2011). Imas (2016) shows that risk-taking depends on whether prior losses have been realized or are mere "paper losses." However, not all experiences hold equal importance: prior gains and losses resulting from more similar tasks have a greater impact on risk-taking (Heinke et al., 2020; Merkle et al., 2020). What is more, insights from macro and finance literature inform our rationale that experienced outcomes – as utilized in our context – affect subsequent decisions. For example, that line of literature emphasizes how past experiences (e.g., gains/losses from investments, exposure to inflation and economic shocks) influence subsequent beliefs and decisions in similar contexts, such as economic forecasts, financial risk-taking, and preference for redistribution (Malmendier and Nagel, 2011; Kuhnen, 2015; Lejarraga et al., 2016; Giuliano and Spilimbergo, 2014; Malmendier and Nagel, 2016). Related literature suggests that beyond the valence of prior experiences (overall gains or losses), the relative trend of the experience might also play a role (Kahneman and Varey, 1990; Loewenstein and Prelec, 1993). It has been shown that improving sequences of outcomes are evaluated higher than deteriorating ones (Ross and Simonson, 1991). Several drivers for this preference for improvement have been proposed, including savoring and dread, loss aversion, and recency effects.

The goal of our paper is threefold: first, we extend existing results to various types of social behavior including altruism, trust, trustworthiness, and cooperation. For this, we conducted five pre-registered and well-powered experiments. Second, we examine whether the preference for improvement mentioned above leads to a differential effect of improving compared to deteriorating sequences of outcomes. Third, we explore the role of similarity on cooperation behavior, comparing social and non-social experiences. While most of the previous literature has focused on standard risky decisions, surprisingly, little is known about the role of prior experiences outside the realm of risk-taking. A notable exception is Schwerter and Zimmermann (2020), who examined experience effects on trust. While social decision situations are different from standard risky decision situations, they often also carry elements of (social) risk (e.g. trust game or public goods game decisions) and, hence, it is conceivable that prior experiences affect behavior in these social domains as well.

# 2 Experimental Design and Procedures

A total of $N = 1,200$ subjects (564 female) participated in one of five pre-registered online experiments conducted using the online-research platform Prolific. Following a

pre-registered power calculation, we collected 240 subjects for each experiment.[1] Subjects received instructions onscreen describing the experiment, which was carried out truthfully. Sessions lasted about 7.5 minutes, and subjects were paid on average £2.62 including a show-up fee of £0.5.

All experiments consisted of two parts. First, subjects experienced two subsequent events, each resulting in a gain or loss of money. Subjects were informed about the outcome of the two events, and any amount lost or gained was withdrawn from or added to their initial endowment of £1.[2] Second, subjects faced one of four social decision-making tasks. At the end of each experiment, we elicited preferences over increasing/deteriorating sequences (Ross and Simonson, 1991), risk attitudes (Dohmen et al., 2011), and trust attitudes (World Value Survey).

### 2.1 Non-Social Experiences

We conducted four experiments with non-social experiences induced via two sequential "double-or-nothing" bets (part one), which resulted in a gain/loss of £0.5. The probability to win an individual bet, subsequently resulting in a gain, was 50%. Each subject experienced one of four sequences: Gain-Gain ($GG$), Gain-Loss ($GL$), Loss-Gain ($LG$), or Loss-Loss ($LL$). Sequences $GG$ and $LL$ resulted in a net gain or loss of £1, respectively. Whilst the sequences $GL$ and $LG$ resulted in the same net outcome of zero, their trend differed: outcomes are deteriorating for the former and improving for the latter.

In part two, subjects faced a different social decision situation in each experiment. In experiment *DG*, subjects played a standard dictator game where they decided how to split £1 between themselves and a passive receiver. We interpret the amount sent as a measure of "altruism." In experiment *TG-S*, subjects played a trust game with an endowment of £1 and a multiplier of three in the role of the sender. The amount sent to the receiver is our measure of "trust." In experiment *TG-R*, subjects played the trust game as receivers using the strategy method. We define "trustworthiness" as the average fraction of the received amount that the receiver returned to the sender. In experiment *PGG*, subjects played a standard, linear public goods game in groups of four, where all contributions to the public good were doubled. We define "cooperation" as the individual amount invested into the group account.

### 2.2 Social Experiences

The structure of the fifth experiment, *PGG-Social*, was identical to *PGG* with the sole exception that the experience in the first part was social in nature. Social experiences

[1] All experiments were pre-registered in the AEA RCT registry. A summary of the pre-registration, as well as the experimental materials and data are available at https://osf.io/n9w3c/. A power analysis for $\alpha = 0.05$, $1 - \beta = 0.80$ shows that we require at least 53 subjects per experienced sequence to detect a medium effect size of $d = 0.50$.

[2] Imas (2016) has shown that such a transfer between accounts is sufficient for outcomes to be realized instead being perceived as mere paper gains/losses.

were induced via two sequential transfers from dictators in a binary dictator game. This resulted in a gain or a loss of the same magnitude as in the double-or-nothing bets used in the other experiments. Subjects were randomly matched with a dictator, selected from a group of dictators, who had already made their decisions in an earlier session. Subjects were informed that in that group of dictators, exactly half chose an allocation resulting in a loss and the other half chose an allocation resulting in a gain for the receiver. Thus, the probabilities of being paired with a "generous" dictator was exactly 50%, matching the probability of a gain in the double-or-nothing bet. Thus, in *PGG-Social*, experiences were more similar to the subsequent contribution decision, but otherwise identical to those in *PGG* in terms of outcomes and probabilities (for a similar approach see Schwerter and Zimmermann, 2020).

### 2.3 Hypotheses

We expected that, due to a preference for improvement (Kahneman and Varey, 1990; Loewenstein and Prelec, 1993), neutral-improving experiences would lead to more altruism, trust, trustworthiness and cooperation compared to neutral-deteriorating experiences. Thus, we pre-registered the following hypothesis:

**$H_1$:** Subjects exhibit more altruism / trust / trustworthiness / cooperativeness following (non-)social improving experiences ($LG$) compared to deteriorating experiences ($GL$).

Further, following existing literature (Imas, 2016; Dimant, 2019; Schwerter and Zimmermann, 2020; Cao et al., 2021), we also expect more altruism, trust, trustworthiness, and cooperation after a positive compared to a negative experience. Note that these sequences involve a net loss or a net gain, respectively, in contrast to the neutral sequences $LG$ and $GL$. The corresponding pre-registered hypothesis is:

**$H_2$:** Subjects exhibit more altruism / trust / trustworthiness / cooperativeness following (non-)social positive experiences ($GG$) compared to negative experiences ($LL$).

## 3 Results

Following our pre-registered analysis plan, sections 3.1 and 3.2 rely on one-sided Wilcoxon rank-sum (WRS) tests to test our hypothesis.

### 3.1 Non-Social Experiences

Figure 1 shows behavior in *DG*, *TG-S*, *TG-R*, and *PGG* following non-social experiences. We find no support for Hypothesis $\mathbf{H_1}$. Neither altruism, trust, trustworthiness, nor cooperation is higher for improving experiences compared to deteriorating ones according to Wilcoxon rank sum (WRS) tests (all $p > 0.255$). Comparing gains to losses in each of the experiments, we also find no support for Hypothesis $\mathbf{H_2}$. There is no differential effect on behavior in any of the four social dimensions (WSR tests, all $p > 0.738$). In

fact, in all four games, social behavior tends to be even smaller following gains ($GG$) than following losses ($LL$) ($DG$: 39.7% versus 43.8%; $TG$-$S$: 40.0% versus 48.0%; $TG$-$R$: 41.5% versus 43.2%; $PGG$: 51.2% versus 53.7%). This latter null result is in line with the results of Schwerter and Zimmermann (2020), who also found no difference in the willingness to trust following a single non-social positive versus negative experience. A robustness analysis, that excludes all subjects who failed to answer all control questions correctly, confirms the above results.[3] In summary, we find that neither the valence nor the relative trend of task-unrelated, non-social experiences affect altruism, trust, trustworthiness, or cooperation.

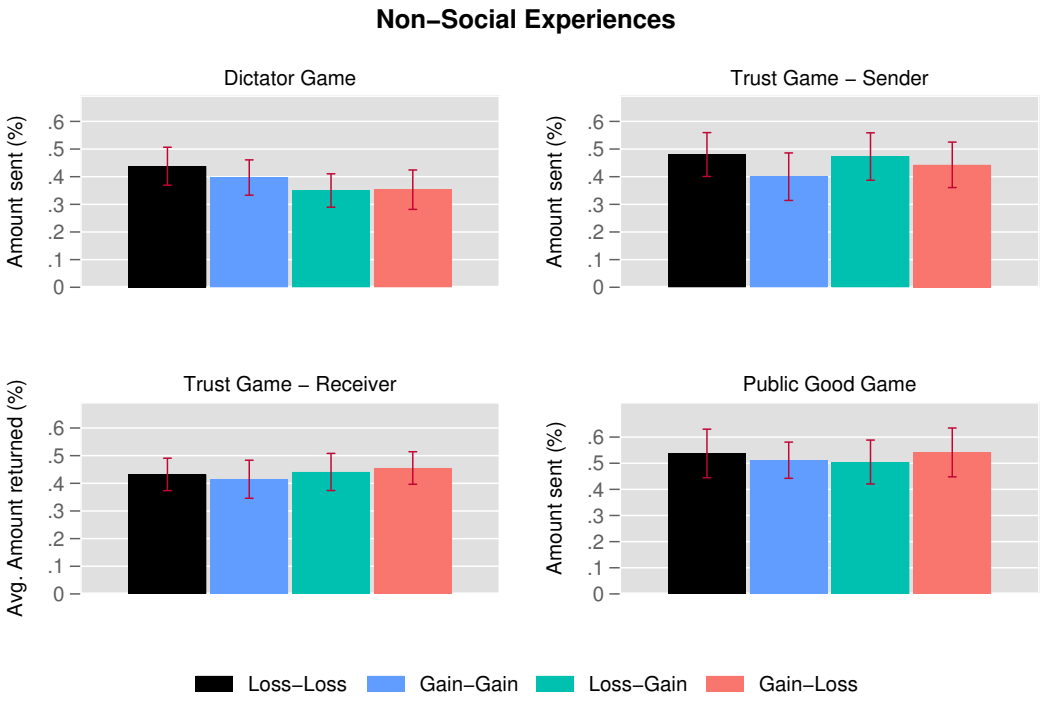


**Figure 1:** Behavior after non-social experiences.

## 3.2 Social Experiences and Cooperation

Figure 2 shows behavior in $PGG$-$Social$ following social experiences. Average contributions following improving ($LG$) and deteriorating ($GL$) experiences were not significantly different (56.6% versus 52.5%; WRS, $N = 121$, $p = 0.159$). This finding suggests that if experiences are also social, the dynamic trend of a prior experience seems not to affect cooperation rates.[4] Turning to valence (overall loss versus gain), we find that average cooperation after gains ($GG$) is 64.7%, whereas it is only 51.0% after losses ($LL$). This difference is statistically significant (WRS, $N = 119$, $p = 0.011$). Thus, in contrast to

[3] The appendix provides further details on robustness checks and regression analyses.

[4] Considering only subjects who who answered all three control questions correctly, we find that for those subjects average contributions following an improving experience are 61.3%, whereas they are only 48.0% following a deteriorating experience. However, this difference fails to reach the pre-registered significance level (WSR, $N = 68$, $p = 0.055$). See the appendix for further details.

non-social experiences, the valence of social experiences affects subsequent cooperation, with gains leading to more cooperation relative to losses.

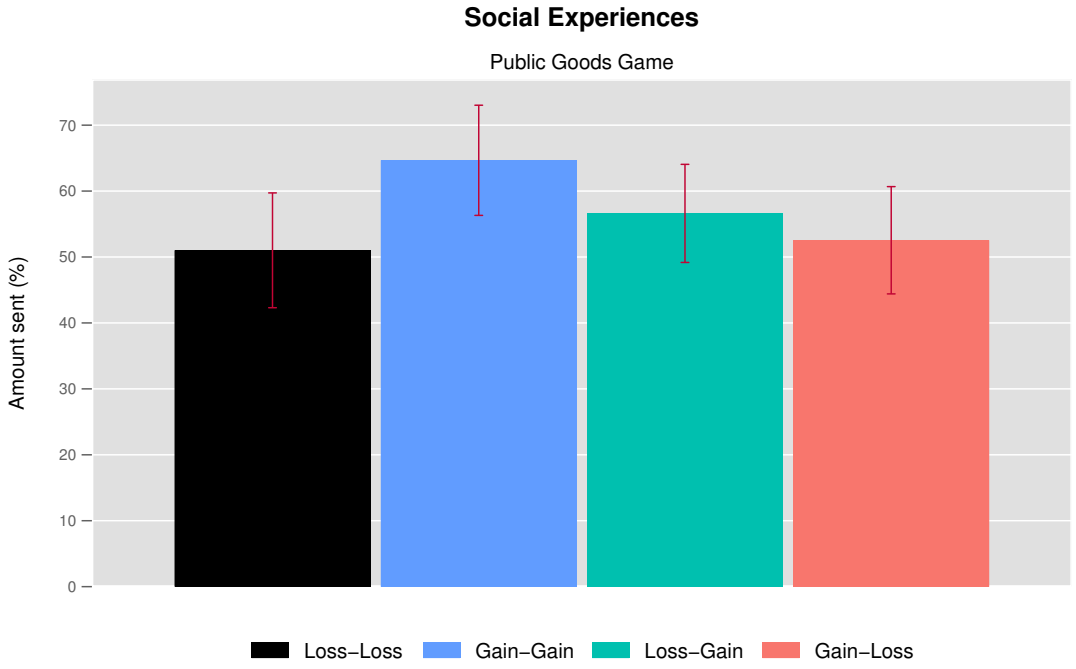


**Figure 2:** Cooperation following social experiences (*PGG-Social*).

### 3.3 The Role of Task-Similarity

In this section, we report on an exploratory analysis comparing cooperation behavior after non-social (*PGG*) and social experiences (*PGG-Social*). Overall, subjects contributed 4.2 percentage points more in *PGG-Social* than in *PGG*. Figure 3 shows a comparison of cooperation rates separately for each sequence of outcomes. If the experience is social, hence more similar to the task, contributions are 13.5 and 6.2 percentage points higher after a positive experience and a neutral-improving experience, respectively. In contrast, following a negative or neutral-deteriorating sequence, contributions tend to be even smaller for social compared to non-social experiences.

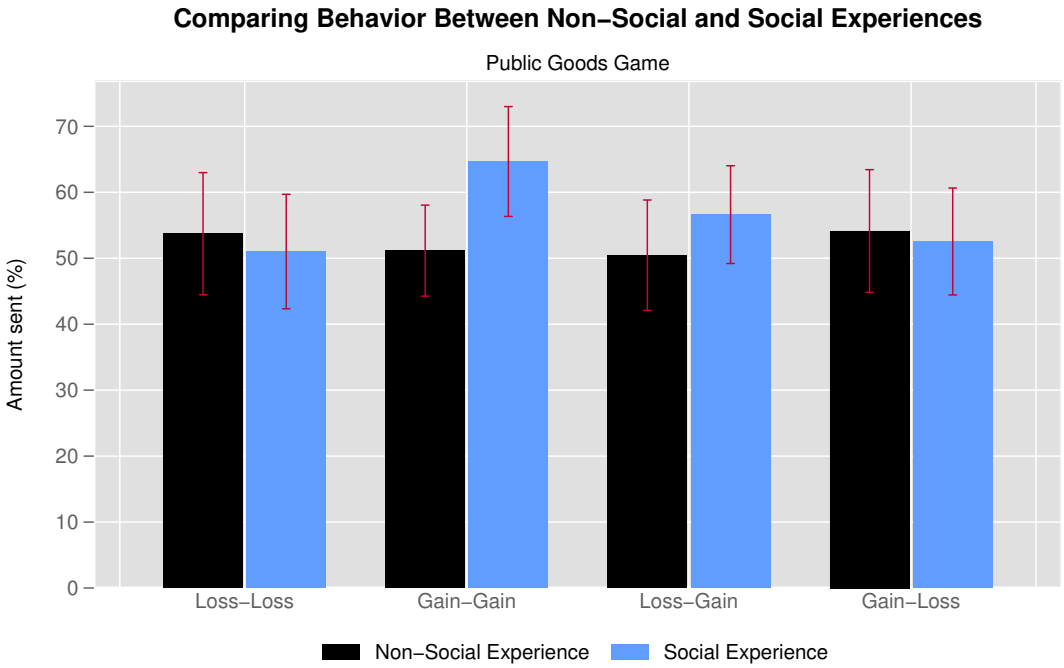


**Figure 3:** Comparison of cooperation behavior between non-social and social experiences.

To quantify the effects, we conducted a series of linear regressions with the cooperation level (amount sent) as dependent variable (Table 1). Comparing cooperation after gains and after losses, we find that for social experiences, cooperation is higher following gains than following losses, confirming our previous observation. Further, the difference in cooperation between positive and negative experiences is smaller for non-social experiences (significant interaction). Comparing cooperation between improving and deteriorating sequences, we find no difference between social and non-social neutral experiences. Specifically, there was no evidence that the dynamic trend (improving versus deteriorating) affects subsequent cooperation.

**Table 1:** Linear regression.

| Cooperation | 1 | 2 |
|---|---|---|
| Non-Social | 0.0497 | −0.0422 |
| | (0.0672) | (0.0587) |
| *GG* | 0.1519** | |
| | (0.0619) | |
| *GG* × Non-Social | −0.1891** | |
| | (0.0866) | |
| *GL* | | −0.0349 |
| | | (0.0577) |
| *GL* × Non-Social | | 0.0962 |
| | | (0.0852) |
| Constant | 0.3181** | 0.3615** |
| | (0.1243) | (0.1150) |
| Controls | Yes | Yes |
| Observation | 248 | 232 |

*Notes:* Standard errors in parentheses. ** $p < 0.05$, *** $p < 0.01$. Omitted controls are gender, age, preferences for improvement, risk, trust, and a dummy indicating correct comprehension checks.

## 4 Conclusion

We reported the results of five pre-registered experiments designed to study the effect of the valence as well as the dynamic trend of sequences of prior experiences on altruism, trust, trustworthiness, and cooperation. Neither valence (gain versus loss) nor the trend (improving versus deteriorating) of prior non-social experiences affect behavior in any of these social domains. However, if experiences are social, hence more similar to the subsequent task, we find more cooperation after positive experiences compared to negative negative ones.

Our results are in line with previous literature on risk-taking that documented effects of prior experiences on subsequent risky decision making. Crucially, these contributions relied on decisions and prior experiences that were also very similar in nature. Hence, our results highlight the importance of similarity between prior experiences and subsequent decisions. Thus, our work also contributes and is consistent with recent literature (Evers and Imas, 2019; Heinke et al., 2020) indicating that similarity between outcomes determines whether they are considered as part of the same or booked to different mental accounts (see also Thaler and Johnson, 1990). With these insights in mind, our results suggest that if a prior experience results from a social interaction, it is more likely to be evaluated jointly with a subsequent social interaction than when it results from an unrelated, non-social task.

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# Appendix A Robustness: Regression Analysis

In the following sections, we present robustness checks that directly correspond to the analyses in the main text. Additional analyses that examine the data in alternative ways (e.g., looking at the impact of outcome sequences at the extensive rather than intensive margin, see pre-registration documents) are available upon request. It should be noted that none of these analyses changes any of our main conclusions.

### Non-social experiences

Table A.1 reports the results of a series of linear regressions that take the amount sent/returned as a dependent variable. For each experiment we conducted two separate regressions, one comparing gains ($GG$) to losses ($LL$) and another comparing improving experiences ($LG$) to deteriorating ones ($GL$). In line with the non-parametric tests reported in the main text, we find no evidence that non-social experiences affect subsequent social behavior in terms of altruism, cooperation, trust, or trustworthiness.

**Table A.1:** Linear regressions for non-social experiences.

| Amount sent/returned | *DG* | *PGG* | *TG-S* | *TG-R* |
|---|---|---|---|---|
| $GG$ (= 1) vs. $LL$ | −0.0356 | −0.0470 | −0.0190 | −0.0402 |
| | (0.0475) | (0.0634) | (0.0487) | (0.0609) |
| $GL$ (= 1) vs. $LG$ | 0.0114 | 0.0597 | −0.0007 | −0.0916 |
| | (0.0497) | (0.0590) | (0.0466) | (0.0672) |

*Notes:* Standard errors in parentheses. $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$. Shown are coefficients of pairwise linear regressions of the amount sent/returned on a dummy that took the value 1 for $GG$ or $GL$ and 0 for $LL$ or $LG$, respectively. Omitted controls are gender, age, preference for increasing/deteriorating sequences, risk attitudes, trust, and correct control questions.

### Social experiences

Table A.2 reports the results of two linear regressions on cooperation in *PGG-Social*, one comparing gains ($GG$) to losses ($LL$) and another comparing improving experiences ($LG$) to deteriorating ones ($GL$). We find significantly more cooperation after a positive compared to a negative experience. In contrast, we again find no evidence for a differential effect of neutral-improving compared to neutral-deteriorating experiences on cooperation. These results are in line with the results obtained from the non-parametric tests in the main text.

# Appendix B Robustness: Lack of understanding

The experiment included the following attention check "hidden" within the instructions.

**Table A.2:** Linear regressions for social experiences.

| Amount sent | 1 | 2 |
|---|---|---|
| *GG* | 0.1556** | |
| | (0.0631) | |
| *LG* | | −0.0397 |
| | | (0.0591) |
| Constant | 0.3252** | 0.4539*** |
| | (0.1605) | (0.1463) |
| Controls | Yes | Yes |
| Observations | 119 | 121 |

*Notes:* Standard errors in parentheses. ** $p < 0.05$, *** $p < 0.01$. Omitted controls are gender, age, preference for increasing/deteriorating sequences, risk attitudes, trust, and correct control questions.

> *Before you proceed, please answer the sports test. The test is simple, when asked for your favorite sport you must enter the word "clear" in the text box below. Based on the text you read above, what favorite sport have you been asked to enter in the text box below?*

Any subject that failed to enter "clear" was excluded from the study immediately and was not counted as a valid data point towards the total number of subjects. In addition, subjects answered three game-specific control questions to check their understanding of the experiment. For example, for *PGG* one of the questions was as follows.

> *If you and all other players invest* 1 *into the group account, then . . . a) your total is* 2 *and each othes' total is* 2*; b) your total is* 0.5 *and each others total is* 1.5*; c) your total is* 1 *and each other's total is* 1*.*

In this section, we report an additional robustness check to ensure that the results are not due to a lack of understanding. To that end, we repeat the analysis reported in Section 3, excluding all subjects who answered at least one control question incorrectly.

We first consider non-social experiences. Also, after exclusion of subjects who might not have understood the instructions (*DG:* 25 out of 240; *TG-S:* 21 out of 240; *TG-R:* 44 out of 240; *PGG:* 112 out of 240), we find no difference in altruism, trust, trustworthiness, or cooperation between improving and deteriorating experiences according to Wilcoxon rank sum (WRS) tests (all $p > 0.255$). The same holds for a comparison of gains to losses in each of the experiments. Here, we also find no differential effect on behavior in any of the four social dimensions (WSR tests, all $p > 0.738$).

Next, we consider social experiences. After excluding subject who might not have understood the instructions (103 of 240 subjects),[5] in *PGG-Social* average contributions following an improving experience are 61.3%, whereas they are only 48.0% following a

[5]Although high, the number of subjects who failed at least one control question in *PGG-Social* is comparable to *PGG*.

deteriorating experience. This difference fails to reach the pre-registered level of statistical significance (WSR, $N = 68$, $p = 0.055$). Turning to valence, we find that the difference between cooperation after gains and cooperation after losses is slightly larger after exclusion (49.3% versus 64.5%) and the difference remains statistically significant (WSR, $N = 68$, $p = 0.029$). This robustness analysis suggests that our results are not the result of a lack of understanding of the experimental instructions.