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Conditional Punishment in England

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Abstract

A large body of literature has shown that peer-to-peer punishment is effective in enforcing cooperation norms in dilemmas. Kamei [2014, Economics Letters 124, pp.199-202] provides experimental evidence on the prevalence of heterogeneous conditional punishment types by conducting an experiment with a strategy method in the United States. This note reports a replication experiment using subjects in England. As consistent with Kamei (2014), the experiment indicates that people's punishment decisions are on average positively proportional to the others' punishment toward the target. However, it also indicates interesting cross-country differences in the distribution of human conditional punishment types.

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1. Introduction

One of the most established findings in the last few decades from experimental research is that peer-to-peer punishment opportunities help resolve people's cooperation dilemmas under some conditions because people punish norm violators even if they incur cost for punishment (e.g., Fehr and Gächter 2000 and 2002). Kamei (2014) provides experimental evidence that (a) people's punishment behavior to a target is conditional upon other members' punishment acts to that target and (b) individuals' conditional punishment behaviors are heterogeneous.

The experiment in Kamei (2014) was conducted in Michigan, the United States. But, how does people's conditional punishment behavior differ by subject pool? This is an important question to explore because the literature has shown that there exists a significant cross-country difference in people's *unconditional* punishment behavior in various games (e.g., Henrich *et al.* 2006, Herrmann *et al.* 2008) and therefore people's conditional punishment behavior may also depend on subject pool. This note reports the results of a replication experiment of Kamei (2014) conducted in England. The results show that two important findings in Kamei (2014) hold also for subjects in England. First, subjects in England on average exhibit the pattern of conditional punishers: the intensity of people's punishment imposed on a target is positively proportional to the others' punishment strength toward the target, whether the target is a cooperator or a non-cooperator. Second, individual conditional punishment types are heterogeneous. Nevertheless, this replication experiment reveals some significant cross-country differences. For instance, the distributions of conditional punishment types are significantly different between the two research sites. This implies that we cannot assume people's conditional punishment behaviors only from Kamei (2014) and we may need some calibration for each subject pool in order to know people's conditional punishment preferences in a given study.

The remainder of this note proceeds as follows: Section 2 briefly describes the experimental design. Section 3 reports results in England and compare them against the data of Kamei (2014). Section 4 concludes.

2. Experiment

At the onset of the experiment, each subject was randomly assigned to a group of four, was given an endowment of ten points, and simultaneously decided whether to allocate the ten points to a group account or a private account (binary choice). If subject *i* allocates it to the private account, she obtains 10 points as a payoff. If she instead allocates 10 points to the group account, each of the four group members obtains 5 points. In other words, the marginal per-capita return (MPCR) is 0.5 in the experiment.

Each member made two kinds of punishment decisions before being informed of their group members' contribution decisions. First, they were asked to submit an amount that they wish to reduce from the payoff of a group member who chose to allocate to the private account (non-cooperator, hereafter). They were also asked to decide an amount that they wish to reduce from the payoff of a group member who chose to allocate to the group account (cooperator, hereafter). We call these two decisions "unconditional punishment decisions."[1] A reduction amount to a member must be an integer between 0 and 4. Second, after all subjects made the two unconditional punishment decisions, they were asked how many punishment points they would assign to a member, assuming that the two remaining group members on average assign a reduction amount $x \in \{0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0\}$ to that member. Subjects made these "conditional punishment" decisions to each of a cooperator and a non-cooperator,

[1] The experimental design is identical to Kamei (2014), except that a strategy method was used for subjects' unconditional punishment decisions in the present paper. The reason that we used the strategy method is to collect more observations on subjects' unconditional punishment acts.

separately. Thus, this conditional punishment task involves 18 (= 2×9) decisions. Both the unconditional and conditional punishment decisions were incentive-compatible. After four members in a group completed the unconditional punishment decisions and then submitted the conditional punishment form, one out of the four members' conditional reduction schedules was randomly selected to be used in each group. The cost ratio of the punishment technology was 1: 3 (the punisher: the punished).

3. Results

The replication experiment was conducted at the University of York in England. A total of 216 students there participated in the experiment. The subjects voluntarily registered for and participated in the sessions, responding to solicitation messages sent through the Hamburg Registration and Organization Online Tool (HROOT; see Bock 2014). All experiments except instructions were programmed in Ztree (Fischbacher 2007). At the onset of the experiment, instructions (see Kamei (2014)) were distributed to the subjects and were read aloud; then subjects were asked to answer comprehension questions before the experiment started.[2]

We first study the total average conditional punishment schedules. As shown in Figure 1, the total average conditional punishment to a target has a positive intercept and is increasing in other members' average punishment points to the target, whether the target is a cooperator or a non-cooperator (lines with triangles). Both the intercepts and slopes are significantly positive at the 5% level or more (see columns (3) and (4) of Part (1), Appendix Table A.1). This result

[2] This replication experiment was conducted along with some treatments of Kamei (2017). Specifically, it was included at the onset of the Kamei (2017)'s experiment. Subjects were informed that they would not interact with group members of the conditional punishment experiment in the later experiment (i.e., the perfect stranger matching protocol was used between the present experiment and Kamei (2017)). Further, subjects were not informed of the details of the experiment of Kamei (2017) when they underwent the conditional punishment experiment. The conversion rate was: 1 pound sterling was equal to 5 points in the experiment.

implies that subjects care about the income inequality between them and other punishers. This suggests that Result 1 in Kamei (2014) is robust when using subjects in England.

RESULT I: *Result 1 in Kamei (2014) holds for subjects in England.*

Despite Result I, a cross-country difference is observed. Figure 1 shows the average conditional punishment schedules for each of cooperators and non-cooperators (dash lines with rectangles and chain lines with diamonds). It indicates that cooperators impose significantly stronger conditional punishment on non-cooperators than non-cooperators do (also see columns (1) and (2) in Part (2) of Appendix Table A.1). This finding supports the idea that a cooperator cares about the income inequality between her and the non-cooperator (the target of punishment) in her group. However, this pattern is in contrast with the results in the United States: non-cooperators impose stronger (although not significantly) conditional punishment on non-cooperators than cooperators do (see Figure 1(a) and Appendix Table B.2, both in Kamei (2014)). Considering that the payoff of a non-cooperator is the same as that of another non-cooperator (the target of punishment) before the punishment stage, the pattern in the United States suggests that the non-cooperators may obtain higher utility when another non-cooperator in their groups obtain lower material payoffs; which is consistent with the spiteful preferences proposed by Levine (1998). This cross-country difference seems to suggest that the types of people's other-regarding preferences may differ by country.

RESULT II: *Unlike Kamei (2014), in England, cooperators impose significantly stronger conditional punishment on non-cooperators than non-cooperators do.*

As for conditional punishment targeted at cooperators, the punishment intensity by non-cooperators is significantly stronger than that by cooperators in both the United States and

England (see again Appendix Table A.1 of the present paper and Appendix Table B.2 in Kamei (2014)). This suggests that non-cooperators are the sources of anti-social punishment.

A look at the individuals' conditional punishment schedules reveals that their conditional punishment profiles are heterogeneous as in Kamei (2014). Figure 2 shows the distributions of conditional punishment types for the subjects in England and the United States. As in Kamei (2014), the data shows that there are five kinds of conditional punishment types: pro-social conditional punishers (those who punish non-cooperators with a strength positively proportional to the others' punishment targeted at the non-cooperators, but do not conditionally punish cooperators), anti-social conditional punishers (those who punish non-cooperators in the same manner as the pro-social conditional punishers, and also conditionally punish cooperators in whatever way possible), free-riders (those who do not punish any one, no matter what circumstance), other pro-social punishers (those who conditionally punish non-cooperators only, but are not classified as the pro-social conditional punishers), and other anti-social punishers (those who conditionally punish cooperators but are not classified as the anti-social conditional punishers). However, the distribution of conditional punishment types is significantly different between the two research sites. For instance, the percentage of the free-riders in the England sample (36.1%) is significantly smaller than that in the USA sample (53.8%).[3] The significantly smaller percentage of free-riders implies that people's punishment may be more effective in enforcing cooperation norms in England than in the United States. One example would be feedback or rating systems on online platforms. Our results may mean that users in England spend more cost (e.g., time) than those in the United States in writing comments for bad shipping experiences when they see others have already written similar reviews there.

[3] A Fisher's exact test indicates that the difference is significant at the 5% level (two-sided p-value = .026).

RESULT III: *Conditional punishment types are heterogeneous in England as is the case in the United States. However, the distribution of the conditional punishment types in England differs from that in the United States.*

Lastly, we note that as in Kamei (2014), the elicited conditional punishment types have high predictability for subjects' unconditional punishment acts in England (Appendix Table A.2). First, the free-rider types unconditionally punish a target very little, whether the target is a cooperator or a non-cooperator. Second, the pro-social conditional punishers and the other pro-social punishers unconditionally impose large punishment points on non-cooperators, but they unconditionally impose almost no punishment points on cooperators. Third, the anti-social conditional punishers and the other anti-social punishers impose large punishment points on both cooperators and non-cooperators.

4. Conclusions

This note reports that subjects' total average conditional punishment to a target in England is increasing in others' punishment to the target, which is consistent with Kamei (2014). The data also shows that subjects' conditional punishment schedules are heterogeneous in England. Nevertheless, a detailed look at the data reveals significant cross-country differences as summarized in Results II and III. This provides a useful remark to readers as to how to interpret the findings of Kamei (2014): although the overall conditional punishment schedules are robust as shown in Result I, the degree of conditional punishment behavior and/or the distribution of conditional punishment types can be different by country. The distribution of punishment types could affect the evolution of cooperation in societies or organizations. For instance, in Hermann *et al.* (2008), contribution dynamics between some countries are different even though the patterns of unconditional punishment are similar to each other (e.g., St. Gallen versus Chengdu).

A potential reason other than the ones discussed in Hermann *et al.* is that these different contribution patterns are partly caused by cross-country differences in the distribution of conditional punishment types. This result also suggests that calibration of people's conditional punishment behaviors for each subject population may be required, for example, if one engages in a theoretical study in which conditional punishment types are assumed.

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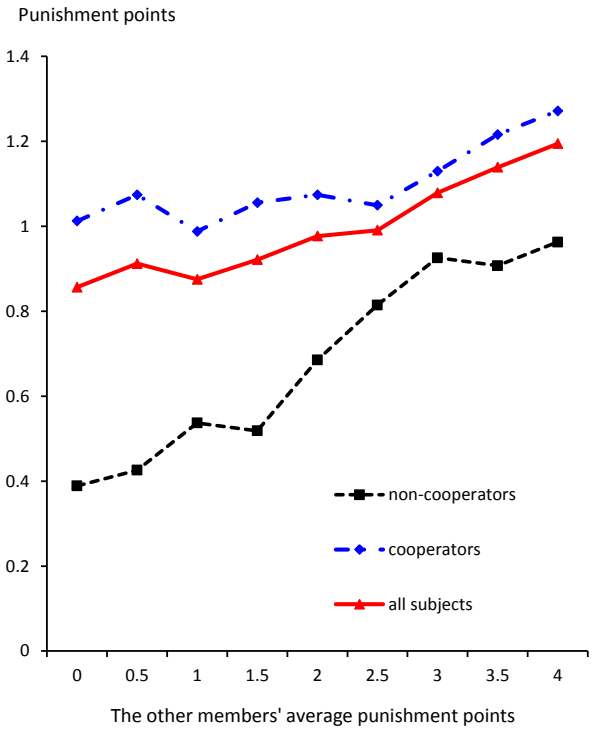
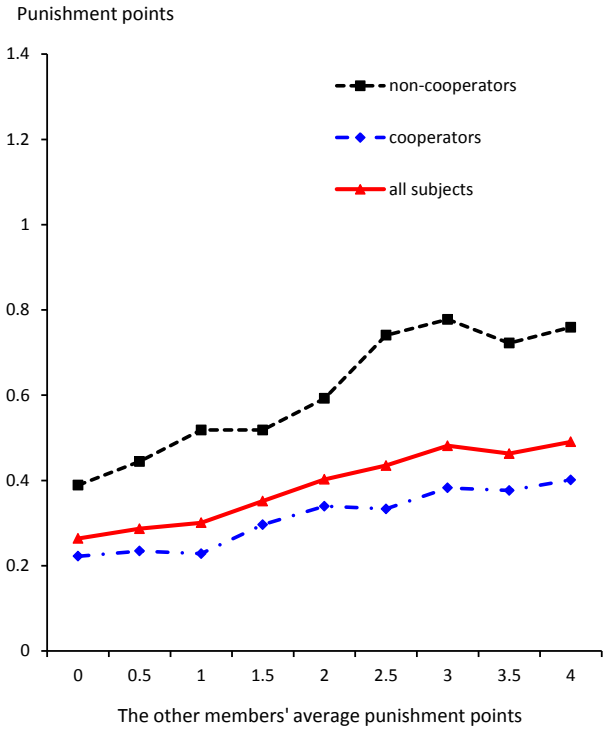
Figure 1. *Average Conditional Punishment Schedules*

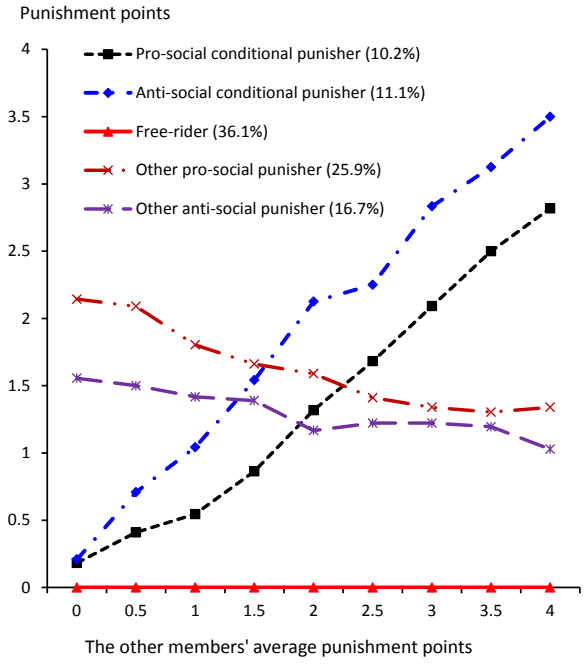


(a) Conditional punishment decisions targeted at a non-cooperator

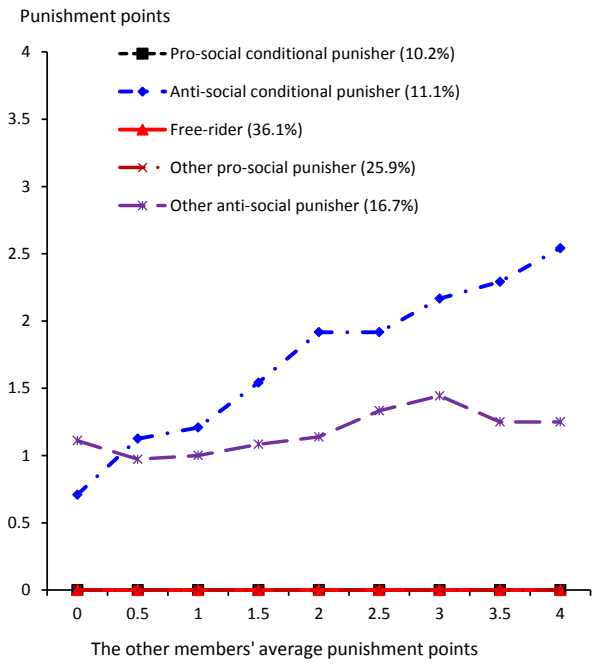


(b) Conditional punishment decisions targeted at a cooperator

Figure 2. *Distributions of Conditional Punishment Types in the United States and England*

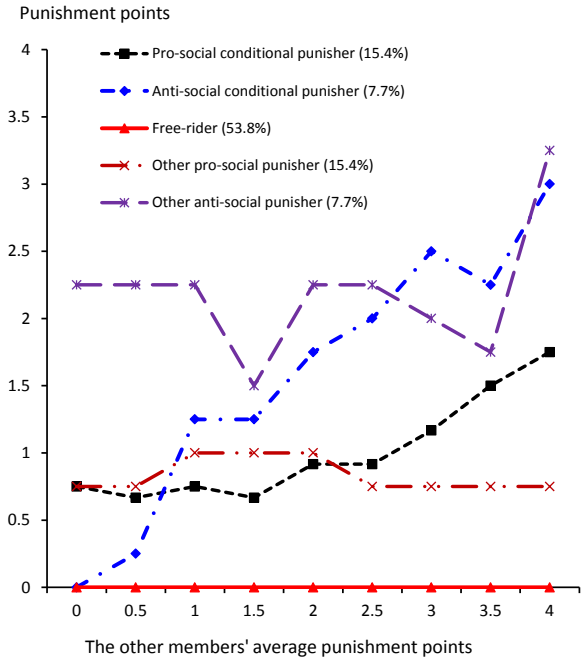


(a) Conditional punishment decisions targeted at a non-cooperator

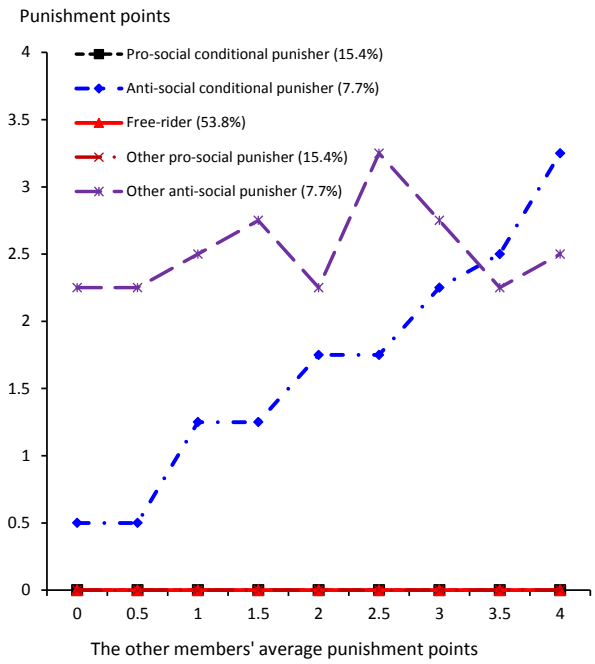


(b) Conditional punishment decisions targeted at a cooperator

(1) England



(a) Conditional punishment decisions targeted at a non-cooperator



(b) Conditional punishment decisions targeted at a cooperator

(2) United States (from data of Kamei (2014))

Notes: See the online Appendix for the criterion of classifying a subject into one of the five types.