The (un)willingness to reward cooperation and punish non-cooperation

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Chapter 4

The willingness to costly reward cooperation and punish non-cooperation before versus after the choice behavior: Sanctioning the past, the present, or the future

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■ Abstract

Numerous empirical studies demonstrate that sanctions can promote cooperative choice behavior. However, to successfully implement sanction opportunities it is not only important to know that sanctions can work, it is also important to know under what conditions people are actually willing to sanction. Although people can decide about sanctioning at various moments in time, it either involves a decision before or a decision after others' choice behavior. We argue that people are less willing to sanction choice behavior that may possibly occur in the future (i.e., beforehand) than choice behavior that did actually occur in the past (i.e., afterwards). In two experiments we showed that people sanction less often and to a lesser extent when sanctioning decisions are made before instead of after the choice behavior. These findings corroborate our reasoning that decision timing has an impact on the willingness to employ costly rewards for cooperation and punishments for non-cooperation.

■ Introduction

The implementation of sanctions is often proposed as an effective means to promote cooperative choice behavior. This proposition is supported by numerous empirical studies demonstrating that positive sanctions (i.e., rewards like bonuses, prices, or privileges) and negative sanctions (i.e., punishments like fines, penalties, or restrictions) stimulate cooperation and minimize non-cooperation (e.g., Fehr & Gächter, 2002; Komorita & Barth, 1985; McCusker & Carnevale, 1995; Rand, Dreber, Ellingsen, Fudenberg, & Nowak, 2009; Sefton, Shupp, & Walker, 2007; Wit & Wilke, 1990; Yamagishi, 1986, 1988; for overviews, see Balliet, Mulder, & Van Lange, 2011; Van Dijk, Molenmaker, & De Kwaadsteniet, 2015). However, to successfully implement sanction opportunities, it is not only important to know that sanctions can work. It is also important to know under what conditions people are actually willing to administer sanctions. After all, sanctions can only show their effect if those in control of rewards and punishments are willing to bear the costs of administering them (i.e., in terms of money, effort and/ or risk). The current research addresses this critical question by focusing on the timing of sanction decisions. That is, we examine whether decision timing has an impact on the willingness to employ rewards for cooperation and punishments for non-cooperation.

Although one can decide to sanction others' choice behavior at various moments in time, it either involves a decision *before* or a decision *after* the choice behavior. Consider, for instance, managers in organizations who have sanctions at their disposal to steer employees' choice behavior in the desired direction. When evaluating the performance of their employees, they can decide afterwards whether employees who furthered the success of the organization should be rewarded (e.g., by giving them a bonus) and whether employees who weakened the success of the organization should be punished (e.g., by cancelling their vacation leave). Whereas in this case the sanctioning decisions are made after the employees' choice behavior, sanctioning decisions can also be made before the choice behavior. For instance, managers can also decide beforehand if those employees who will further the success of the organization should be rewarded and whether those employees who will weaken the success of the organization should be punished. Until now, very little experimental research has been done to investigate whether the willingness to sanction choice behavior *beforehand* differs from the willingness to sanction choice behavior *afterwards*. This is unfortunate since a better understanding of the impact of decision timing not only has a practical relevance for those who implement sanction opportunities, it may also shed new light on how people make sanctioning decisions.

The need for sanctions

To address the timing of sanctioning decisions, one should first understand why authorities may need to implement sanction opportunities. There are many everyday situations (at work, home, or other places) that require us to cooperate with others. Although cooperative choice behavior is beneficial to the collective in these situations, it is not self-evident that individuals will cooperate (Dawes, 1980). To give just one example, employees may be more motivated to further their own careers than to further the success of their organization. Personal interest may thus collide with the collective interest (Hardin, 1968; Olson, 1965; Samuelson, 1954).

Situations in which personal interests conflict with collective interests are generally referred to as social dilemmas (for overviews, see Parks, Joireman, & Van Lange, 2013; Van Lange, Joireman, Parks, & Van Dijk, 2013; Weber, Kopelman, & Messick, 2004). It is within this context of social dilemmas that we investigate the willingness to sanction.

Public transport, medical care, and clean environments are all examples of goods and services that stand or fall with individuals' willingness to provide and maintain them because they can, in fact, be used freely by everyone (Samuelson, 1954). If too many people choose not to contribute to the provision of these public goods, it may eventually be impossible to provide them and all will be worse off. However, public goods provision – which is a specific type of social dilemma called the public good dilemma (Camerer, 2003; Dawes, 1980) – is not only a problem on a societal or global level, it is a problem for groups in general. After all, the performance of groups is usually based on each group members' effort to attain the goals of the group, and if too many group members lack effort (i.e., free-ride) the performance of the group may be jeopardized. Thus, to prevent collective failure, it is often necessary to make cooperation more attractive and non-cooperation less attractive (e.g., Hardin, 1968; Olson, 1965).

Straightforward tools to increase the relative attractiveness of cooperation over non-cooperation are rewards for those who cooperate, and punishments for those who do not cooperate (Messick & Brewer, 1983; Van Lange, Rockenbach, & Yamagishi, 2014). Indeed, several studies have shown that the opportunity to use costly punishments enables people to self-govern social dilemmas (e.g., Fehr & Gächter, 2000, 2002; Gürerk, Irlenbusch, & Rockenbach, 2006; Ostrom, Burger, Field, Norgaard, & Policansky, 1999; Rand et al., 2009; Yamagishi, 1986). For example, Ostrom, Walker, and Gardner (1992) demonstrated that in small groups people especially punish those group members who tend to free-ride on the generosity of others. A costly sanctioning opportunity enhances the level of cooperation in such groups. Furthermore, some people even are willing to punish others' selfishness when direct gains for themselves are absent (Fehr & Fischbacher, 2004; Fehr & Gächter, 2002). In fact, the presence of individuals within a group who are willing to deter non-cooperation with costly punishments (i.e., strong reciprocators) is considered to be a prerequisite for the evolution of cooperation (e.g., Boyd & Richerson, 1992; Fehr & Rockenbach, 2004; Gintis, 2000; Gintis, Bowles, Boyd, & Fehr, 2003; Gintis, Henrich, Bowles, Boyd, & Fehr, 2008).

Whereas prior research demonstrated that people may be willing to use costly punishments for non-cooperation, the use of costly rewards for cooperation has received far less attention (for some exceptions, see e.g., Rand et al., 2009; Sefton et al., 2007). This is remarkable, as rewards are just as effective as punishments in promoting cooperation (e.g., Balliet et al., 2011). In addition, the scarce research done on rewarding revealed that people generally prefer to administer rewards over punishments (Chapters 2 and 3; Molenmaker, De Kwaadsteniet, & Van Dijk, 2014, 2016; also see Molm, 1997; Sutter, Haigner, & Kocher, 2010; Wang, Galinsky, & Murnighan, 2009). Thus, to identify whether the willingness to promote cooperative choice behavior *before* the choice behavior differs from the willingness to promote cooperative choice behavior *after* the choice behavior, one should address both reward of

cooperation and punishment of non-cooperation. In the present research, we therefore take both types of sanctions into consideration and investigate their sensitivity to the timing of sanctioning decisions.

The timing of sanctioning decisions

Why would the timing of sanctioning decisions have an impact on the willingness to costly reward and punish? To answer this question, we draw attention to the fact that a decision beforehand differs markedly from a decision afterwards. One of the most apparent differences between these two moments in time is that afterwards people decide about the sanctioning of choice behavior that has actually taken place in the past, whereas beforehand people decide about the sanctioning of choice behavior that may or may not take place in the future. We argue that this fundamental difference between facing choice behavior that *may possibly occur in the future* (i.e., beforehand) or choice behavior that *did actually occur in the past* (i.e., afterwards) radically alters the decision environment. More importantly, we aim to show that this alteration of the decision environment has an impact on the willingness to employ costly rewards for cooperative choice behavior and costly punishments for non-cooperative choice behavior.

Decision timing alters the decision environment, first and foremost, because in the decision environment beforehand (as opposed to the decision environment afterwards) it is not known yet whether particular choice behavior will actually occur in the future. Research on the disjunction effect (e.g., Shafir, 1994; Shafir, Simonson, & Tversky, 1993; Shafir & Tversky, 1992; Tversky & Shafir, 1992) demonstrated that uncertainty about outcomes may induce nonconsequential reasoning (see also Langer, 1975; Messé & Sivacek, 1979; Quattrone & Tversky, 1984). That is, if the outcome of a particular situation is unknown, people are often reluctant to think through the implications of all possible outcomes (e.g., Tversky & Shafir, 1992) and are less likely to make decisions based on uncertain information than on certain information (Van Dijk & Zeelenberg, 2003). To illustrate this, it is informative to consider an example given by Tversky and Shafir (1992). In one of their studies on the disjunction effect, participants were presented the hypothetical scenario in which they had just taken a qualifying exam and had either passed the exam, failed the exam, or did not know whether they had passed or failed the exam. Next, the willingness to book a vacation to Hawaii was measured. The majority of the participants were willing to book the vacation when they knew that they had passed the exam. The same preference was observed when they had failed the exam. However, when they did not know whether they had passed or failed the exam, only a minority of the participants were willing to book the vacation. Apparently, they reasoned that they could not book the vacation if they did not know their test result. Participants' decisiveness to book the vacation was thus hampered by the uncertainty about the outcome of the exam, which is an example of nonconsequential reasoning. After all, if they would have known their test result, they would have booked the vacation, regardless of whether they had passed or failed the exam. We believe that a similar effect may be observed for sanctioning decisions. That is, people may be less willing to employ costly sanctions if the choice behavior is not known yet (see Van Dijk, De Kwaadsteniet, & Mulder, 2009). Since in the decision environment beforehand others'

actual choice behavior still has to take place – whereas in the decision environment afterwards it did actually take place – we thus argue that people may be less willing to sanction choice behavior beforehand than afterwards.

In addition, there may be another reason as to why decision timing may alter the decision environment. Decision timing may also have an impact on how people experience others' choice behavior. Scholars from various disciplines have proposed that emotions are an important proximate mechanism underlying the willingness to employ sanctions (e.g., Darley & Pittman, 2003; Dawes, Fowler, Johnson, McElreath, & Smirnov, 2007; Fehr & Fischbacher, 2004; Fehr & Gächter, 2002; Pillutla & Murnighan, 1996; Rotemberg, 2008; Sanfey, Rilling, Aronson, Nystrom, & Cohen, 2003; Seip, Van Dijk, & Rotteveel, 2009; Van't Wout, Kahn, Sanfey, & Aleman, 2006; Wang et al., 2009). For instance, the anger that people experience about selfish peers or unfair choice behavior in general has been identified as a driving force of costly punishment (e.g., De Kwaadsteniet, Rijkhoff, & Van Dijk, 2013; Nelissen & Zeelenberg, 2009; Seip, Van Dijk, & Rotteveel, 2014). The anger experienced when confronted with others' non-cooperative choice behavior in the past does, however, not necessarily resemble the anger associated with thinking about the possibility that non-cooperative choice behavior may occur in the future. After all, how people experience future events may frequently differ in intensity and quality from how they experience present or past events (e.g., Loewenstein, 1996; Loewenstein & Lerner, 2003; Miceli & Castelfranchi, 2015). Inspired by work on the disjunction effect (e.g., Tversky & Shafir, 1992; Van Dijk & Zeelenberg, 2003), research revealed that people experience less intense emotions based on uncertain outcomes than on certain outcomes (Van Dijk & Zeelenberg, 2006; Wang, Li, & Jiang, 2012). Since it is not known yet what choice behavior will actually occur in the decision environment beforehand (as opposed to the decision environment afterwards), one might thus expect that the intensity of the emotions experienced in the decision environment beforehand is lower than in the decision environment afterwards. The fact that people may experience less intense emotions beforehand than afterwards is consistent with the notion that decision environments can be characterized as "cold" when decisions are made about future events and as "hot" when decisions are made about present events (see Loewenstein, 1996; Loewenstein & Schkade, 1999; Wang et al., 2011). The timing of sanctioning decisions may thus also constitute a distinction between hot and cold decision environments, which may be another reason why people may be less willing to sanction choice behavior in the decision environment beforehand than in the decision environment afterwards.

The present research

In this chapter, we examine whether the timing of sanction decisions has an impact on the willingness to reward cooperative choice behavior and punish non-cooperative choice behavior. More specifically, we test the prediction that people are less willing to sanction choice behavior when sanctioning decisions are made before (instead of after) the occurrence of others' choice behavior. In two experiments, we use a third party sanction paradigm in which participants have the opportunity to reward a cooperator or the opportunity to punish a non-cooperator (see Fehr & Fischbacher, 2004; Molenmaker et al., 2014). We manipulate

the timing of the sanction decision by presenting participants either with choice behavior that could possibly occur in the future (i.e., beforehand) or with choice behavior that did actually occur in the past (i.e., afterwards). Subsequently, we measure participants' willingness to sanction that particular choice behavior by having them decide whether to employ a sanction (i.e., choice to sanction) and decide about the size of sanction they employed (i.e., sanction size). We examine both the choice to sanction and the sanction size since both are indicators of the willingness to sanction (Molenmaker et al., 2014, 2016). As outlined in the introduction of this chapter, we argue that there are two reasons why people would be less willing to sanction choice behavior beforehand than afterwards: decision timing may (1) induce nonconsequential reasoning and (2) constitute a hot/cold distinction.

To our knowledge, we are the first to investigate whether the willingness to sanction differs between the decision environment beforehand and the decision environment afterwards. However, it should be noted that the timing of decisions does connect with studies that were specifically aimed at investigating the behavioral validity of two experimental methods frequently used in research on social decision making: the *strategy method* and the *direct-response method* (see e.g., Brandts & Charness, 2011; Brosig, Weimann, & Yang, 2003; Fischbacher, Gächter, & Quercia, 2012; Selten, 1967). The strategy method requires individuals to make precompiled strategies for responding to all feasible choices that others' could possibly make (i.e., decide about multiple possible choices), whereas the direct-response method, by contrast, requires individuals to only respond to others' actual choices (i.e., decide about a single choice). Although these two response methods were not designed to study the impact of decision timing, the strategy method has similarities with situations in which sanction decisions are made beforehand and the direct-response method has similarities with situations in which sanction decisions are made afterwards.

The results of the studies that directly compared the strategy method with the direct-response method are, however, mixed. Some research, for instance, revealed differences between both methods on decisions that involved emotions, especially when the decisions were punitive in nature (for an overview, see Brandts & Charness, 2011). For example, unfair offers were rejected less frequently in strategy response than in direct response (Güth, Huck, & Müller, 2001; Oxoby & McLeish, 2004). Moreover, lower punishment rates in economic interactions were observed in strategy response than in direct response to another's choices (Brandts & Charness, 2003; Brosig et al., 2003). Finally, a study by Falk, Fehr, and Fischbacher (2005) demonstrated that non-cooperation was punished to a lesser extent in strategy response than in direct response, even though the proportion of individuals choosing to punish was equal in both methods. Unfortunately, very few studies compared reward-like decisions in the strategy method versus the direct-response method, and the results of the studies that did were inconsistent (Brandts & Charness, 2011). Research that is indirectly related to rewarding has, for instance, shown that trust seems to be repaid less frequently in strategy response than in direct response (Casari & Cason, 2009; but see Büchner, Coricelli, & Greiner, 2007). However, people were not less willing to reciprocate others' cooperative choice behavior in strategy response than in direct response (Fischbacher et al., 2012; Muller, Sefton, Steinberg, &

Vesterlund, 2008; also see Reuben & Suetens, 2012). Whereas these studies were on trust and reciprocity (and did not address rewarding directly), a study by Brandts and Charness (2003) focused on people's use of actual rewards in economic interactions. Their results indicated that lower reward rates were observed in strategy response than in direct response to another's choices, although this difference was not statistically significant.

Research that directly compared the strategy method with the direct-response method is thus inconclusive about whether the willingness to sanction in strategy response differs from the willingness to sanction in direct response to others' choice behavior (for an overview, see Brandts & Charness, 2011). In addition, despite the similarities between the two response methods and the two timing moments we distinguish (beforehand versus afterwards), there also are important differences. Most importantly, people in the decision environment beforehand do not necessarily have to make full precompiled strategies for all feasible choices that could possibly occur, as is the case with the strategy method. Whereas the strategy method forces people to think through the implications of all possible outcomes, in reality they are often reluctant to do so (e.g., Shafir, 1994; Shafir et al., 1993; Shafir & Tversky, 1992; Tversky & Shafir, 1992), thereby giving rise to the disjunction effect. As such, the above makes apparent that we have to go beyond prior research that compared the strategy method with the direct-response method to examine whether decision timing has an impact on the willingness to reward cooperation and punish non-cooperation.

■ Experiment 4.1

To investigate the timing of both reward and punishment decisions in social dilemmas, we conducted a first experiment in which participants were third party observers of a one-shot public good task (see Fehr & Fischbacher, 2004; Molenmaker et al., 2014). As third party observers, participants themselves were not involved in the public good task but they had the opportunity to reward the group members or the opportunity to punish the group members (sanction type manipulation). These sanctioning decisions either had to be made before or after the group members had made their choices (decision timing manipulation). For exploratory purposes, we also measured the (anticipated) emotional reactions to the choice behavior. Based on our reasoning, we predicted that people would sanction others' choice behavior less often and to a lesser extent when they decided beforehand than afterwards. Furthermore, we explored whether the impact of decision timing would have a different effect on the reward of cooperation than on the punishment of non-cooperation.

Method

Participants and design

We recruited 159 students from a university in the Netherlands (97 women and 62 men; M_{age} = 21.44 years, SD_{age} = 3.74) to participate in an experiment on "group decision making".[1]

[1] For each experiment, we aimed to recruit as many participants as possible within the given time available in the lab (approximately two weeks per experiment).

A 2 (Decision Timing: Beforehand versus Directly afterwards) × 2 (Sanction Type: Reward versus Punishment) between-participants factorial design was used.

Procedure

When participants arrived at the laboratory, they were seated in separate cubicles, each containing a personal computer to give instructions and register their responses. Assignment to one of the four conditions was randomly determined by a computer automated procedure. Participants were instructed that they had to perform a joint task with four fellow participants whose identities were unknown to them. The choices they would make in the joint task determined how much extra money they could earn on top of the standard initial participation fee. Participants learned that whether they would actually receive this extra money would be determined by a lottery after the study was conducted.

The participants were instructed that they were randomly assigned to a different role than the other four persons in the joint task (for a similar procedure, see Molenmaker et al., 2014). That is, their role was to observe the other four persons performing a one-shot public good task. Each person in the public good task would be endowed with €10 (which is approximately US $13) that they could either keep for themselves or contribute to a common pool. When contributed to the common pool, the €10 would be multiplied by 1.5 and divided equally among the four persons in the public good task (i.e., each would receive €3.75). Thus, the participants learned that the four persons had to make a dichotomous choice between being cooperative (i.e., contributing the €10 to the common pool) or not being cooperative (i.e., keeping the €10 for themselves). After participants read the instructions about the public good task, we posed four practice questions to ensure that they understood the task. We asked, for example, what would happen if a person would contribute his/her €10 to the common pool. The correct answer was disclosed after answering each question.

After this, participants read the instructions about their own role in the joint task. The instructions explained that they would be endowed with 100 points (worth €0.10 each) per person. In the reward conditions, participants could keep these points for themselves, but they could also assign points as increment points (we never used the word 'reward'). The value of the assigned increment points would be multiplied by 3 and added to the individual outcome of the person concerned. Thus, it would cost the participant €0.10 to increase a group member's outcome with €0.30. The instructions in the punishment conditions were identical, except that they could assign points as decrement points (we also never used the word 'punishment') and the value of the assigned decrement points would be multiplied by 3 and subtracted from the individual outcome of the person concerned. Thus, it would cost the participant €0.10 to decrease a group member's outcome with €0.30 (for a similar procedure, see Molenmaker et al., 2014).

In the instructions about participants' role in the joint task, we also introduced our manipulation of decision timing. In the beforehand conditions, participants learned that they had to decide about assigning points before the others actually decided about contributing their €10. That is, participants would have to compose a binding strategy for responding to the cooperative or non-cooperative choice that the persons could make in the public good

task. In addition, they were informed that they would have to make separate strategies for each person in the public good task.[2] In contrast, participants in the directly afterwards conditions learned that they had to decide about assigning points after their group members had decided about contributing their €10. Thus, they would have to respond to the cooperative or non-cooperative choice that the persons had actually made in the public good task.

Participants in all conditions also learned that the other four persons would be informed beforehand about the presence of a fifth person in the joint task who would have the opportunity to increase (reward conditions) or decrease (punishment conditions) their individual outcomes. Moreover, the instructions in the beforehand conditions also stated that group members would not be informed what this fifth person had decided before they themselves had decided about contributing their €10. Note that we thus merely manipulated when participants would make their sanction decisions, not when their group members would learn about the sanction decisions. In this way, we ruled out the possibility that participants in the beforehand conditions would opt for sanctioning to influence the four persons' choices in the public good task, while participants in the afterwards conditions would not have this opportunity because the choices in the public good task are already made. To ensure comprehension of their role in the joint task, we again posed four practice questions. For example, we asked participants when they would have to decide about assigning points. The correct answer was disclosed after answering each question.

Subsequently, the joint task started and participants were endowed with their first 100 points. In the beforehand conditions, we presented participants with the possibility that a person (named person M, see Footnote 2) would contribute his/her €10 to the common pool in the reward condition or would keep it for his/herself in the punishment condition.[3] We reminded participants that this was a possible choice that person M could make and that their decision would be executed if it would turn out that person M actually made this choice (i.e., their decision was binding). In the reward condition, we first asked whether the participants wanted to assign points as increment points and when they decided to assign increment points to person M, they had to indicate how many increment points they assigned. The procedure in the punishment condition was identical, except that they could assign points as decrement points.

In the directly afterwards conditions, we first asked participants to wait until we could confirm that all four persons had read their instructions and had made their choice in the public good task, which took about a minute. Next, they received the (bogus) feedback that a person

[2] We decided to ensure that the participants would make a sanction decision in response to an identifiable (but anonymized) person in both the beforehand and afterwards conditions (instead of one strategy in the beforehand conditions that would apply to all persons in the public good task) since research by Small and Loewenstein (2003, 2005) has shown that identifiability can influence people's sanctioning decisions.
[3] To keep the beforehand and afterwards conditions as identical as possible, we instructed participants that we would present each feasible choice one by one instead of presenting all feasible choices at once, as in the strategy method (Selten, 1967).

(named M) had contributed his/her €10 to the common pool in the reward condition or had kept it for him/herself in the punishment condition. In response to this actual choice that person M had made, we first asked participants whether they wanted to assign points as increment points in the reward condition or as decrement points in the punishment condition, and if they decided to assign points to person M, they had to indicate how many points they assigned. In all conditions, the maximum number of points participants could assign to person M was 100 points (and the minimum was zero points).

Next, we asked participants about their emotional reactions to the (*possible*) choice by person M. On a 9-point rating scale ranging from 1 (*not at all*) to 9 (*totally*), participants in the directly afterwards conditions indicated to what extent nine statements currently applied to them, whereas participants in the beforehand conditions indicated to what extent they anticipated that these statements would apply to them when later on it would turn out that person M has actually made this choice. To measure participants' positive emotions, we posed besides happiness ("*This choice by person M makes me feel happy*") also four additional positive emotional reactions (i.e., joy, pride, admiration, and elevation). To measure their negative emotions, we posed besides anger ("*This choice by person M makes me feel angry*") also three additional negative emotional reactions (i.e., fury, disappointment, and contempt).

At this point in the experiment, participants in all conditions had only learned about person M's (*possible*) choice in the public good task (see Footnote 2), and were asked about their sanction response and (anticipated) emotional reactions to particularly this cooperative choice behavior in the reward conditions or non-cooperative choice behavior in the punishment conditions (see Footnote 3). Next, participants were informed that the joint task was stopped. Before the participants were thoroughly debriefed and paid (1 course credit or €3 monetary compensation), we first checked our manipulations, the believability and the comprehension of the joint task. Finally, after the experiment was performed by all the participants, ten participants were randomly selected who received their actual earnings from the joint task.

Results

Manipulation checks

The manipulation of sanction type was checked by asking participants whether they could assign increment or decrement points. All participants (100%) answered this question correctly. We checked the manipulation of decision timing by asking participants whether they had to decide about assigning increment points (*decrement points*) before or after the other four persons made their choices in the public good task. All participants except three (98.1%) answered this question correctly.[4] Based on these results we can conclude that our manipulations were successful and we included the data of all 159 participants in the analyses.

[4] The data of these participants were included in the analyses because exclusion of the data did not alter the pattern of results.

Choice to sanction

We started by analyzing the effect of decision timing (Beforehand versus Directly afterwards) and sanction type (Reward versus Punishment) on the proportion of participants choosing to sanction (N = 159). In accordance with our prediction, a binary (Sanction Choice: 0 = not sanctioned, 1 = sanctioned) logistic regression yielded a significant Decision Timing main effect (B = 1.04, SE = 0.47, Wald (df=1) = 4.97, p = .026, Odds Ratio = 2.84, 95% CI [1.13, 7.12]). This main effect indicated that the proportion of participants choosing to sanction beforehand (75.6%) was significantly lower than the proportion of participants choosing to sanction directly afterwards (88.8%). Moreover, the analysis yielded a significant Sanction Type main effect (B = 2.19, SE = 0.58, Wald (df=1) = 14.37, p < .001, Odds Ratio = 8.91, CI [2.87, 27.58]), which showed that the proportion of participants choosing to punish (69.6%) was significantly lower than the proportion of participants choosing to reward (95%).

The impact of decision timing did not differ between reward and punishment, as indicated by the non-significant Decision Timing × Sanction Type interaction effect, B = 0.13, SE = 1.28, Wald (df=1) = 0.01, p = .921, Odds Ratio = 1.14, 95% CI [0.09, 14.07]. A closer inspection of the proportions for reward and punishment (also see Table 4.1 for the frequencies), revealed that only in the punishment condition the proportion of participants choosing to punish beforehand (59%) seems significantly lower than the proportion of participants choosing to punish directly afterwards (80%), $\chi^2(1) = 4.13$, p = .042, Odds Ratio = 2.78, CI [1.02, 7.59]. In the reward condition, the proportion of participants choosing to reward beforehand (92.5%) did not differ significantly from the proportion of participants choosing to reward directly afterwards (97.5%), $\chi^2(1) = 1.05$, p = .305, Odds Ratio = 3.16, CI [0.32, 31.78]. This suggests that the main effect of decision timing on the proportion of participants choosing to sanction is particularly driven by the choice to punish, and less so by the choice to reward. A possible explanation might be that the willingness to reward was so high (Molenmaker et al., 2014, 2016), that a potential difference in the choice to reward between the beforehand and directly afterwards conditions could not occur (i.e., a ceiling effect).

Sanction size

Furthermore, a 2 (Decision Timing: Beforehand versus Directly afterwards) × 2 (Sanction Type: Reward versus Punishment) ANOVA on the number of points (N = 159) yielded a marginal significant Decision Timing main effect ($F(1,155) = 3.06$, p = .082, η^2 = .01, 90% CI [.00, .06]). As predicted, the size of the sanctions administered beforehand (M = 32.72, SD = 31.98) was smaller than the size of the sanctions administered directly afterwards (M = 40.80, SD = 36.59). Furthermore, the analysis yielded a significant Sanction Type main effect ($F(1,155) = 52.90$, p < .001, η^2 = .25, CI [.16, .34]), which showed that the size of the punishments (M = 19.51, SD = 27.19) was significantly smaller than the size of the rewards (M = 53.85, SD = 32.52).

The impact of decision timing did again not differ between reward and punishment, as indicated by non-significant Decision Timing × Sanction Type interaction effect, $F(1,155)$ = 1.09, p = .298, η^2 = .01, 90% CI [.00, .04]. But a closer inspection of the simple effects

Table 4.1. *Number of participants choosing to sanction by Decision timing and Sanction type in Experiments 4.1 and 4.2.*

			Choice to sanction	
Experiment	Decision timing	Sanction type	Yes	No
1	Beforehand	Overall	60	19
		Punishment	23	16
		Reward	37	3
	Afterwards	Overall	71	9
		Punishment	32	8
		Reward	39	1
2	Beforehand	Overall	45	24
		Punishment	15	22
		Reward	30	2
	Afterwards	Overall	127	16
		Punishment	61	9
		Reward	66	7
	Directly afterwards	Overall	68	5
		Punishment	34	2
		Reward	34	3
	Delayed afterwards	Overall	59	11
		Punishment	27	7
		Reward	32	4

for reward and punishment (see also Table 4.2 for the mean number of points and standard deviation per condition) revealed that only the size of the rewards administered beforehand (M = 47.25, SD = 29.00) was significantly smaller than the size of the rewards administered directly afterwards (M = 60.45, SD = 33.82), $F(1,155) = 3.93$, $p = .049$, $\eta^2 = .03$, CI [.00, .08]. In contrast, the size of the punishments administered beforehand (M = 17.82, SD = 28.05) did not differ significantly for the size of the punishments administered directly afterwards (M = 21.15, SD = 26.59), $F(1,155) = 0.19$, $p = .67$, $\eta^2 < .01$, CI [.00, .03]. This seems to indicate that the main effect of decision timing on the number of points assigned to sanction is particularly driven by the size of the rewards, and less so by the size of the punishments. As prior research suggested (Molenmaker et al., 2014), a possible explanation might be that a potential difference in the punishment size between the beforehand and directly afterwards conditions could not occur because participants were very reluctant to punish (i.e., a floor effect).

Emotional reactions

We also analyzed the effects of decision timing (Beforehand versus Directly afterwards) on participants' emotional reactions. Since we gave different feedback in the reward conditions (i.e., a cooperative choice) and punishment conditions (i.e., a non-cooperative choice), we analyzed participants' positive emotions to the cooperative choice (i.e., the reward conditions;

Table 4.2. *Number of points assigned by Decision timing and Sanction type in Experiments 4.1 and 4.2.*

			Sanction size	
Experiment	Decision timing	Sanction type	*M*	*SD*
1	Beforehand	Overall	32.72	31.98
		Punishment	17.82	28.05
		Reward	47.25	29.00
	Afterwards	Overall	40.80	36.59
		Punishment	21.15	26.59
		Reward	60.45	34.82
2	Beforehand	Overall	22.69	31.44
		Punishment	11.43	24.35
		Reward	34.60	33.81
	Afterwards	Overall	42.30	37.04
		Punishment	24.44	27.03
		Reward	59.42	37.40
	Directly afterwards	Overall	44.95	36.11
		Punishment	26.89	28.75
		Reward	62.51	34.07
	Delayed afterwards	Overall	39.54	38.05
		Punishment	21.85	25.25
		Reward	56.25	40.77

$N = 79$) and negative emotions to the non-cooperative choice (i.e., the punishment conditions; $N = 78$) in separate analyses. First, a MANOVA on positive emotions about the cooperative choice showed no significant effect of decision timing on the positive emotional reactions, $V = 0.09$, $F(5,74) = 1.39$, $p = .24$, $\eta_p^2 = .09$. Second, a MANOVA on negative emotions about the non-cooperative choice also showed no significant effect of decision timing on the negative emotional reactions, $V = 0.04$, $F(4,74) = 0.73$, $p = .58$, $\eta_p^2 = .04$. See Table 4.3 for the overall means and standard deviations.

Discussion

The results of Experiment 4.1 provide first evidence for our reasoning that decision timing has an impact on the willingness to employ costly rewards for cooperative choice behavior and costly punishments for non-cooperative choice behavior. The willingness to sanction was lower when participants decided before the choice behavior than when they decided after the choice behavior. More specifically, participants both rewarded and punished less often and to a lesser extent in the decision environment beforehand than in the decision environment afterwards. However, a closer inspection of the results did suggest that the impact on the choice to sanction was particularly driven by punishment and the impact on sanction size was particularly driven by reward. Also note that we found no difference between the anticipated emotional reactions beforehand and the actual emotional reactions directly afterwards, which

Table 4.3. *Emotional reactions to the cooperative or non-cooperative choice in Experiments 4.1 and 4.2.*

		Experiment 4.1		Experiment 4.2	
Feedback	Emotions	*M*	*SD*	*M*	*SD*
Cooperative choice	Happiness	6.64	2.06	6.46	1.76
	Joy	6.50	1.79	6.44	1.77
	Pride	5.77	2.05	6.43	2.12
	Admiration	6.65	1.92	6.77	2.02
	Elevation	3.97	2.47	3.91	2.05
Non-cooperative choice	Anger	3.57	2.23	4.08	2.19
	Fury	2.96	2.20	3.28	1.99
	Disappointment	5.22	2.31	5.16	2.34
	Contempt	4.14	2.33	4.84	2.19

may suggest that a distinction between hot and cold decision environments may not necessarily explain our behavioral findings. To elaborate further on this tentative conclusion, we designed Experiment 4.2.

■ Experiment 4.2

Sanctioning either involves a decision *before* or a decision *after* others' choice behavior. Our first experiment demonstrated, however, that people are not as willing to sanction beforehand as they are willing to sanction afterwards. The aim of Experiment 4.2 was, first of all, to replicate the findings of Experiment 4.1. But although we argue that the willingness to sanction beforehand differs from the willingness to sanction afterwards, this is not the only temporal distinction that may alter the decision environment. In real-life, it is often the case that sanctioning decisions are *not* made directly after the choice behavior, but at a later moment in time. Importantly, deciding directly afterwards versus after a time delay has – besides deciding beforehand versus directly afterwards – also been related to the distinction between hot and cold decision environments (see e.g., Harinck & De Dreu, 2008; Wang et al., 2011). The fact that emotions tend to have a relatively short lifespan (Fridhandler & Averill, 1982) suggests that "hot" decision environments become less emotionally charged after some time has passed, and thus turn into colder decision environments (see Loewenstein, 1996; Loewenstein & Lerner, 2003; Loewenstein & Schkade, 1999). Put differently, the intensity of emotions may be lower after a time delay than directly afterwards (see also Gross, 1998; Ray, Wilhelm, & Gross, 2008). To further examine the impact of decision timing on the willingness to sanction, we therefore not only focused on the willingness to sanction beforehand and directly afterwards, but also on the willingness to sanction after a time delay (i.e., delayed afterwards).

Given that emotions have been identified as possible driver of the willingness to employ sanctions (e.g., De Kwaadsteniet et al., 2013; Fehr & Gächter, 2002; Seip et al., 2014), but also tend to have a relative short lifespan (Fridhandler & Averill, 1982), it may very well be that people are less willing to sanction after a time delay than directly afterwards. Preliminary support

for this reasoning can be found in research by Wang and colleagues (2011) who demonstrated that people react less punitive to others' norm transgressions after a short time delay than when they react directly afterwards. Their research also showed, however, that such an effect is only observed if people are distracted during the time delay, such that they cannot re-arouse the experienced anger by ruminating about the anger-arousing stimulus (see also Fridhandler & Averill, 1982; Gross, 1998; Harinck & De Dreu, 2008; Ray et al., 2008). In Experiment 4.2, we therefore manipulated the time delay by using the same distraction task as Wang and colleagues (2011) used in one of their experiments (i.e., the dots-estimation task; e.g., Gerard & Hoyt, 1974). If people experience intense emotions about others' choice behavior, we expect that they would particularly be willing to sanction in the decision environment directly afterwards, and less so in the decision environment after a time delay (and the decision environment beforehand). Testing this prediction was the second aim of Experiment 4.2.

It is important to note, however, that sanctioning does not necessarily have to be an emotional response due to 'heated tempers', it can also result from deliberate reasoning (see Schroeder, Steel, Woodell, & Bembenek, 2003). Indeed, this would explain why we found no difference in Experiment 4.1 between the anticipated emotional reactions beforehand and the actual emotional reactions directly afterwards. The fact that we did find that the willingness to sanction was lower beforehand than afterwards is consistent with the notion that people are less willing to employ costly sanctions if the choice behavior is not known yet (see Van Dijk et al., 2009), as is the case in the decision environment beforehand. Thus, the observed pattern of results in Experiment 4.1 fits the explanation in terms of nonconsequential reasoning (see also e.g., Shafir, 1994; Shafir & Tversky, 1992; Tversky & Shafir, 1992; Van Dijk & Zeelenberg, 2003), which presupposes more nonconsequential reasoning before rather than after others' choice behavior. A nonconsequential reasoning account does, however, not distinguish between whether decisions are made directly after the choice behavior or only after a time delay (as in both cases, people may be expected to engage in consequential reasoning). An interesting implication of this could be that adding a decision environment with a time delay provides us with a useful paradigm to further illuminate the reasons why people would be less willing to sanction choice behavior beforehand than afterwards.

In sum, in Experiment 4.2 we provided another test of the impact that decision timing may have on the willingness to sanction by focusing on the willingness to sanction beforehand, directly afterwards and after a time delay. Our main prediction is that people would sanction others' choice behavior less often and to a lesser extent when they decide beforehand than when they decide afterwards, thereby replicating the findings of Experiment 4.1. This pattern of results would, first and foremost, fit the explanation in terms of nonconsequential reasoning since this account only distinguishes between a decision environment beforehand and a decision environment afterwards, and not between a decision environment directly afterwards and a decision environment after a time delay. If the hot/cold distinction would have explanatory power for the sanctioning decisions in our research, we may also expect that people would sanction others' choice behavior less often and to a lesser extent when they decide in the decision environment after a time delay than in the decision environment directly afterwards. Moreover, we again explored whether the impact of decision timing would

differ between reward of cooperation and punishment of non-cooperation. In addition to our behavioral measures, we also again measured the (anticipated) emotional reactions to the choice behavior.

Method

Participants and design

215 students from a university in the Netherlands (148 women and 67 men; M_{age} = 20.47 years, SD_{age} = 4.09) were recruited to participate in an experiment on "group decision making". We used a 3 (Decision Timing: Beforehand versus Directly afterwards versus Delayed afterwards) × 2 (Sanction Type: Reward versus Punishment) between-participants factorial design.

Procedure

The procedure of Experiment 4.2 was almost identical to the procedure of Experiment 4.1. Thus, the instructions explained that the participants' role was to observe the four other persons performing a one-shot public good task. Whereas participants in Experiment 4.1 learned that the four persons in the public good task had to decide whether they would contribute their endowment of €10 to the common pool or keep it for themselves (i.e., dichotomous choice), participants in Experiment 4.2 learned that the persons had to decide *how many* euros from their endowment of €10 they would contribute to the common pool and *how many* euros they would thus keep for themselves (i.e., a continuous choice). Thus, instead of the dichotomous choice that we used in our first experiment, the persons in the public good task had to determine their degree of (non-)cooperativeness in our second experiment. The (bogus) feedback about the decision that a person (named person M) would possibly make (beforehand conditions) or had actually made (afterwards conditions) was, however, again the choice to contribute all his/her €10 to the common pool in the reward conditions or to keep it all for his/herself in the punishment conditions.

The delayed afterwards conditions were almost identical to the directly afterwards conditions. However, immediately after participants in the delayed afterwards conditions received the feedback (but before we asked them whether they wanted to assign points) they had to perform a dots-estimation task (Gerard & Hoyt, 1974; Sivanathan, Molden, Galinsky, & Ku, 2008; Wang et al., 2011). In this 5 minutes task – which has been shown to decrease the intensity of emotions because it interferes with emotional thoughts (see Wang et al., 2011) – participants had to make a series of estimations about the number of dots that were presented on their computer screen for 5 seconds. The feedback about person M's (*possible*) choice remained on the screen during the task. To rule out the possibility that performing the dots-estimation task itself (and not its distracting nature) would influence our results, participants in the beforehand and directly afterwards conditions also had to perform the dots-estimation task. However, they performed the task both before we presented the feedback and they could make their sanction decision. As such, participants in all conditions performed the dots-estimation task, but only in the delayed afterwards conditions it served as a distracting filler task between the feedback and the sanction decision.

As in Experiment 4.1, participants in all conditions were asked whether they wanted to assign points, and if they decided to assign points to person M, they had to indicate how many points they assigned. The maximum amount of points participants could assign to person M was again 100 points (and the minimum was zero points), and each assigned point would cost the participant €0.10 but increased the personal outcome of person M with €0.30 in the reward conditions or decreased the personal outcome of person M with €0.30 in the punishment conditions.

Results

Manipulation check

The manipulation of sanction type was checked by asking participants whether they could assign increment or decrement points. All participants except one (99.1%) answered this question correctly. The manipulation of decision timing was checked by asking participants whether they had to decide about assigning increment points (*decrement points*) beforehand, directly afterwards, or after a time delay. This question was answered correctly by all participants except fifteen (93%). These fifteen participants who gave an incorrect answer were mainly part of the delayed afterwards conditions (11 participants), which suggests that they did not recognized the filler task as a time delay (see Footnote 4). We conclude that our manipulation of decision timing was successful and included the data of all 215 participants in the analyses.

Choice to sanction

We first performed a binary (Sanction Choice: 0 = not sanctioned, 1 = sanctioned) logistic regression (N = 215) to analyze the effects of decision timing (Beforehand versus Directly afterwards versus Delayed afterwards) and sanction type (Reward versus Punishment) on the proportion of participants choosing to sanction. As predicted, the analysis yielded a significant Decision Timing main effect (Wald (df=2) = 19.70, $p < .001$). Planned contrasts revealed that the proportion of participants choosing to sanction beforehand (62.5%) was significantly lower than the proportion of participants choosing to sanction afterwards (88.8%), regardless of whether they decided directly afterwards or after a delay, B = 1.70, SE = 0.39, Wald (df=1) = 19.29, p = .001, Odds Ratio = 5.50, 95% CI [2.57, 11.76]. In addition, the proportion of participants choosing to sanction directly afterwards (93.2%) did not differ significantly (but marginally) from the proportion of participants choosing to sanction after a delay (84.3%), B = 0.97, SE = 0.58, Wald (df=1) = 2.84, p = .092, Odds Ratio = 2.64, CI [0.85, 8.19]. Moreover, the significant Sanction Type main effect (B = 1.29, SE = 0.40, Wald (df=1) = 10.57, p = .001, Odds Ratio = 3.62, CI [1.67, 7.85]) showed that the proportion of participants choosing to punish (71%) was significantly lower than the proportion of participants choosing to reward (88.9%). Also see Table 4.1 for the frequencies.

Furthermore, the Decision Timing × Sanction Type interaction effect was significant (Wald (df=2) = 6.12, p = .047); not because sanction type altered the difference in proportions of participants choosing to sanction directly afterwards and after delay (B = 1.14, SE = 1.16, Wald (df=1) = 0.95, p = .329, Odds Ratio = 3.11, 95% CI [0.32, 30.42]), but because

sanction type significantly altered the difference in proportions of participants choosing to sanction beforehand and afterwards (B = 2.01, SE = 0.83, Wald (df=1) = 5.93, p = .015, Odds Ratio = 7.48, CI [1.48, 37.84]). That is, the proportion of participants choosing to punish beforehand (40.5%) was significantly lower than the proportion of participants choosing to punish afterwards (87.1%), regardless of whether they decided directly afterwards (94.4%) or after a delay (79.4%), $\chi^2(1) = 25.55$, $p < .001$, Odds Ratio = 9.94, CI [3.81, 25.95]. In contrast, the proportion of participants choosing to reward beforehand (85.7%) did not differ significantly from the proportion of participants choosing to reward afterwards (90.4%), regardless of whether they decided directly afterwards (91.9%) or after a delay (88.9%), $\chi^2(1) = 0.53$, p = .467, Odds Ratio = 1.57, CI [0.46, 5.36]. As in Experiment 4.1, these findings might indicate a ceiling effect (see also Molenmaker et al., 2014, 2016).

Sanction size

Next, we analyzed the effect of decision timing and sanction type on the number of points with a 3 (Decision Timing: Beforehand versus Directly afterwards versus Delayed afterwards) × 2 (Sanction Type: Reward versus Punishment) ANOVA (N = 215), which yielded a significant Decision timing effect, $F(2,209) = 9.07$, $p < .001$, $\eta^2 = .12$, 90% CI [.06 .19]. Planned contrasts revealed that the size of the sanctions administered beforehand (M = 22.69, SD = 31.44) was significantly smaller than the size of the sanctions administered afterwards (M = 42.30, SD = 31.44), regardless of whether they decided directly afterwards or after a delay, $t(209) = 4.11$, $p < .001$, d = 0.59, 95% CI [0.30, 0.88]. In addition, the size of the sanctions administered directly afterwards (M = 44.95, SD = 36.11) did not differ significantly from the size of the sanctions administered after a delay (M = 39.54, SD = 38.05), $t(209) = 1.06$, p = .289, d = 0.18, CI [-0.15, 0.51]. Moreover, the analysis yielded a significant Sanction Type main effect ($F(1,209) = 51.46$, $p < .001$, $\eta^2 = .18$, 90% CI [.11, .26]), which showed that the size of the punishments (M = 19.94, SD = 28.81) was significantly smaller than the size of the rewards (M = 51.38, SD = 37.95).

Furthermore, the impact of decision timing did not differ between reward and punishment, as indicated by the non-significant Decision Timing × Sanction Type interaction effect, $F(2,209) = 0.84$, p = .432, $\eta^2 = .01$, 90% CI [.00, .04]. A closer inspection of the simple contrasts for reward and punishment (see also Table 4.2 for the mean number of points and standard deviation per condition) revealed that the size of the rewards administered beforehand (M = 34.60, SD = 33.81) was significantly smaller than the size of the rewards administered afterwards (M = 59.42, SD = 37.40), regardless of whether they decided directly afterwards (M = 62.51, SD = 34.07) or after a delay (M = 56.25, SD = 40.77), $t(209) = 3.90$, $p < .001$, d = 0.80, 95% CI [0.39, 1.21]. In addition, also the size of the punishments administered beforehand (M = 11.43, SD = 24.53) was significantly smaller than the size of the punishments administered afterwards (M = 24.44, SD = 27.03), regardless of whether they decided directly afterwards (M = 26.89, SD = 28.75) or after a delay (M = 21.85, SD = 25.25), $t(209) = 2.14$, p = .03, d = 0.44, CI [0.03, 0.84]. This demonstrates that the main effect of decision timing on the on the number of points assigned to sanction is driven by both the size

of the rewards and punishments, although the effect seems greater for reward (d = 0.80, CI [0.39, 1.21]) than for punishment (d = 0.44, CI [0.03, 0.84]).

Emotional reactions

The effects of decision timing (Beforehand versus Directly afterwards versus Delayed afterwards) on participants' positive emotions to the cooperative choice (i.e., the reward conditions; N = 108) and negative emotions to the non-cooperative choice (i.e., the punishment conditions; N = 107) were analyzed in separate analyses. First, a MANOVA on positive emotions about the cooperative choice showed no significant (but marginal) effect of decision timing on the positive emotional reactions, V = 0.16, F(10,204) = 1.74, p = .074, η_p^2 = .08. [5] Second, a MANOVA on negative emotions about the non-cooperative choice also showed no significant effect of decision timing on the negative emotional reactions, V = 0.11, F(8,204) = 1.46, p = .17, η_p^2 = .05. See Table 4.3 for the overall means and standard deviations.

Discussion

The results of Experiment 4.2 further corroborated our reasoning that decision timing (beforehand versus afterwards) has an impact on the willingness to employ costly rewards for cooperative choice behavior and costly punishments for non-cooperative choice behavior. That is, participants sanctioned less often and to a lesser extent before others' choice behavior than after others' choice behavior. Experiment 4.2 also showed that the willingness to sanction directly afterwards was not significantly different from the willingness to sanction after a distracting time delay.[6] In addition, the emotional reactions that participants reported were

[5] Although the MANOVA on positive emotions was marginally significant, separate one-way ANOVAs did reveal (marginal) significant effects of decision timing on pride (F(2,105) = 2.64, p = .08, η^2 = .09, 90% CI [.02, .18]) and admiration (F(2,105) = 6.34, p = .003, η^2 = .20, CI [.08, .29]). Planned contrasts showed that the anticipated pride (M = 5.00, SD = 2.03) and admiration (M = 5.89, SD = 2.18) in the beforehand condition was lower than the experienced pride (M = 6.73, SD = 2.12) and admiration (M = 7.19, SD = 1.80) in the afterwards conditions (Pride: t(105) = 2.15, p = .03, d = 0.44, 95% CI [0.33, 0.85]; Admiration: t(105) = 3.29, p = .001, d = 0.68, CI [0.26, 1.09]), whereas the emotions did not differ between the directly afterwards condition and the delayed afterwards conditions (Pride: t(105) = 0.80, p = .43, d = 0.19, CI [-0.27, 0.65]; Admiration: t(105) = 1.33, p = .19, d = 0.31, CI [-0.15, 0.77]).

[6] We ran an additional experiment (Experiment 4.3) with a 2 (Decision Timing: Directly afterwards versus Delayed afterwards) × 2 (Sanction Type: Reward versus Punishment) between-participants factorial design in which we used the game Tetris (e.g., Holmes, James, Coode-Bate, & Deeprose, 2009; Van Dillen, Van der Wal, & Van den Bos, 2012) – instead of the dots-estimation task – as a 3 minutes filler task. The binary (Sanction Choice: 0 = not sanctioned, 1 sanctioned) logistic regression on the proportion of participants choosing to sanction (N = 112) yielded only a significant Sanction Type main effect (B = 2.48, SE = 0.78, Wald (df=1) = 10.14, p = .001, Odds Ratio = 11.92, 95% CI [2.59, 54.79]), which showed that the proportion of participants choosing to punish (69.6%) was significantly lower than the proportion of participants choosing to reward (96.4%). The Decision Timing main effect (B = 0.44, SE = 0.55, Wald (df=1) = 0.65, p = .420, Odds Ratio = 1.55, 95% CI [0.53, 4.51]) and the Decision Timing × Sanction

not different between conditions (as in Experiment 4.1). In the general discussion of this chapter, we further reflect on these findings.

■ General discussion

The decision to reward cooperative choice behavior and to punish non-cooperative choice behavior can be made at various moments in time. However, it either involves a decision *before* or a decision *after* the choice behavior. In the present chapter, we argued and showed that people are less willing to employ costly sanctions when they decide beforehand than when they decide afterwards. In the decision environment beforehand others' actual choice behavior still has to take place in the future, whereas in the decision environment afterwards the choice behavior did actually take place in the past. Research on the disjunction effect revealed that the presence of uncertainty about outcomes may induce nonconsequential reasoning (e.g., Shafir & Tversky, 1992; Tversky & Shafir, 1992; Van Dijk & Zeelenberg, 2003). In accordance with this work, we demonstrated that people are less willing to sanction choice behavior that *may possibly occur in the future* than choice behavior that *did actually occur in the past*. More specifically, people rewarded cooperation and punished non-cooperation less often and to a lesser extent when sanctioning decisions were made before (instead of after) the occurrence of others' choice behavior (Experiments 4.1 and 4.2), regardless of whether they decided directly afterwards or after a time delay (Experiment 4.2). By doing so, we thus revealed that people are less willing to employ costly sanctions if the choice behavior is not known yet.

At this point, it is important to stress that we do not claim that the experience of emotions directly afterwards may never be related to the impact that decision timing can have on the willingness to employ costly sanctions. After all, emotions have been identified as a driving force of sanctioning decisions (e.g., De Kwaadsteniet et al., 2013; Nelissen & Zeelenberg, 2009; Seip et al., 2014), and the emotions that people experience may differ in intensity and quality between the decision environment beforehand and the decision environment afterwards (e.g., Loewenstein, 1996; Loewenstein & Lerner, 2003; Loewenstein & Schkade, 1999; Miceli & Castelfranchi, 2015). The present research revealed, however, that the experience of emotions directly afterwards does not seem to be a necessary precondition of differences in the willingness to employ costly sanctions before versus after others' choice behavior. It would therefore be a good idea for future research to investigate whether the experience of (intense)

Type interaction effect (B = 0.51, SE = 1.56, Wald (df=1) = 0.11, p = .743, Odds Ratio = 1.67, 95% CI [0.79, 35.16]) both were non-significant. The ANOVA on the number of points (N = 112) yielded only a significant Sanction Type main effect (F(1,108) = 57.70, p < .001, η^2 = .35, 90% CI [.23, .45]), which showed that the size of the punishments (M = 15.54, SD = 24.73) was significantly smaller than the size of the rewards (M = 60.61, SD = 36.62). The Decision Timing main effect (F(1,108) = 0.67, p = .415, η^2 < .01, CI [.00, .05]) and the Decision Timing × Sanction Type interaction effect (F(1,108) = 0.27, p = .606, η^2 < .01, CI [.00, .04]) both were non-significant. Thus, also with a different distracting task during the time delay we found no difference in the willingness to costly reward cooperation and punish non-cooperation between the directly afterwards conditions and the delayed afterwards conditions.

emotions would amplify the impact that decision timing (beforehand versus afterwards) has on sanctioning decisions, for example, by experimentally manipulating such emotions (see Seip et al., 2014).

Another point worth mentioning is that, whereas the present research demonstrated that both the willingness to reward cooperation and the willingness to punish non-cooperation are sensitive to the timing of sanctioning decisions, the impact of decision timing is not necessarily identical for both types of sanctions. Prior research has shown that people are generally reluctant to punish non-cooperation and prefer to reward cooperation (Chapters 2 and 3; Molenmaker et al., 2014, 2016; see also Molm, 1997; Sutter et al., 2010; Wang et al., 2009). Consistent with these earlier findings, we also showed that participants punished non-cooperation less often and to a lesser extent than they rewarded cooperation. However, our results – those of Experiment 4.2 in particular – suggest that this relative preference for the use of rewards over punishments may be more pronounced when sanctioning decisions are made beforehand than when they are made afterwards. After all, participants were particularly reluctant to opt for punishing before (as compared to after) the choice behavior, whereas they were very willing to opt for rewarding, both beforehand and afterwards. An interesting direction for future research would therefore be to examine whether people particularly are more reluctant to punish (as compared to reward) others' actual choice behavior they are not certain about yet (see Van Dijk et al., 2009).

Although one should always be cautious when generalizing experimental results to practice, we do want to address an interesting practical implication that may derive from our work. When implementing sanction opportunities in real-life social dilemmas, policymakers should realize that whether people consider sanctioning the appropriate course of action can differ across time (see also March, 1994; Messick, 1999). Whereas people may employ sanctions after the choice behavior has occurred, they may not be that willing to employ them before the choice behavior has occurred. When the opportunity to sanction beforehand is not used sufficiently, implementing the opportunity to sanction afterwards can thus be decisive to promote cooperative choice behavior.

In addition to this practical implication, our work may also contribute to the methodological debate about the behavioral validity of the strategy method and the direct-response method (e.g., Brandts & Charness, 2011; Brosig et al., 2003; Fischbacher et al., 2012; Selten, 1967). Given that there are similarities between the two response methods and the two timing moments that we distinguished in our experiments (beforehand versus afterwards), the insight that people are less willing to sanction choice behavior beforehand (which has not taken place yet, as compared to choice behavior afterwards) may thus also apply to the strategy method. As such, it may very well be that the mixed results of the studies that compared the strategy method with the direct-response method (see Brandts & Charness, 2011) could be explained by the fact that it is not known yet whether particular choice behavior will occur in the future. Future research should investigate whether the impact of uncertainty about the choice behavior is attenuated by the fact that the strategy method may force people to think through the implications of all possible outcomes (see e.g., Shafir, 1994; Shafir et al., 1993; Shafir & Tversky, 1992; Tversky & Shafir, 1992).

Before closing, we also want to discuss two aspects of the experimental paradigm we used. First of all, we used a third party paradigm in our experiments. As third party observers, participants themselves were not involved in the public good dilemma they observed (Fehr & Fischbacher, 2004; Molenmaker et al., 2014). Whereas this procedure eliminated the possibility that participants' interpretation of the choice behavior was colored by self-interest, the willingness to sanction may be higher when they take part in the social dilemma themselves (i.e., a second party paradigm) because in such situations revenge-like motives might drive the infliction of harm (e.g., see De Quervain et al., 2004). As such, the impact of decision timing might be different when people's personal outcomes are affected by others' choice behavior. However, this is an empirical question and should be addressed in future research (see Appendix A).

Another point worth discussing is that we focused on the willingness to sanction in a one-shot interaction. One-shot interactions constitute an appropriate setting to test the impact of decision timing, as this setting eliminates confounds that might arise in repeated interactions (Gächter & Herrmann, 2009). For example, strategic considerations about future interactions do not play a role in one-shot interactions, only whether people consider it the appropriate course of action to sanction others' choice behavior. It would be interesting to examine to what extent decision timing effects persist as people gain experience in repeated interactions or have gained experience in comparable interactions with other people. Does deciding beforehand (as compared to afterwards) have less of an impact on sanctioning decisions when people are more experienced with the dilemma at hand? In addition, it would be interesting to examine whether the effect of decision timing on the willingness to employ sanctions has consequences for the enforcement of cooperative choice behavior. Does the fact that people are less willing to sanction beforehand than afterwards lead to lower levels of cooperation in repeated interactions? A fruitful avenue for future research may thus be to investigate the impact of decision timing on the willingness to sanction in repeated interactions.

Conclusions

The present work substantiates that decision timing (beforehand versus afterwards) has an impact on the willingness to costly sanction. In our research, we demonstrated that people are less willing to sanction beforehand than afterwards, regardless of whether they decide directly afterwards or after a time delay. These findings imply that people are less willing to sanction choice behavior that *may possibly occur in the future* than choice behavior that *did actually occur in the past*. As such, our findings shed new light on the willingness to costly reward cooperative choice behavior and punish non-cooperative choice behavior. At the same time, we provide a better understanding of the use of sanction opportunities to promote cooperative choice behavior.