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Procedural fairness facilitates cooperative behavior by enhancing cooperative expectations

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Abstract

Two experiments were conducted to explore whether and why procedural fairness may promote cooperation. In both experiments, participants first took part in a task in which they were connected to an allocator who then either selected a fair or an unfair procedure for allocating outcomes between them. After this manipulation of procedural fairness, participants performed a second task in which we studied their cooperation in a chicken game. In Experiment 1, participants were informed that their opponent in the chicken game was the same person who had previously selected the fair (vs. unfair) procedure. In Experiment 2, participants learned that their opponent in the chicken game had not been involved in the selection of the prior procedure. Both studies showed that having experienced a fair (vs. unfair) procedure facilitated subsequent cooperation in the chicken game. Mediation analyses suggest that this positive effect was explained by the finding that the prior experience of procedural fairness induced participants to expect higher levels of cooperation from their opponent, even when this opponent was not involved in the prior experience of procedural fairness.

KEYWORDS

chicken game, cooperative behavior, cooperative expectations, fairness heuristic, procedural fairness, social norm, social interaction

1 | INTRODUCTION

Cooperation is essential in many of our daily interactions. To further the collective welfare, people often need to cooperate rather than compete (Rand, 2016; Van Lange et al., 2013). This is true for large-scale collective interests, such as preserving the climate or providing collective facilities like hospitals, but also for activities on a smaller scale, such as those in work teams. In settings mentioned above, the collective welfare not necessarily coincides with the personal interest (Hardin, 1968). As a result, people may face a social dilemma between furthering the collective welfare (i.e., cooperation) or their self-interest (i.e., non-cooperation (NC)) (for overviews on social dilemmas, see Parks et al., 2013; Van Dijk & De Dreu, 2021; Van Lange et al., 2013).

A complicating factor is that social dilemmas are often characterized by social uncertainty (Messick et al., 1988)—that is, people have to make decisions without yet knowing the decisions that others will make. In such settings, people may have to rely on their expectations of other's cooperativeness (Engel et al., 2021). As the Goal Expectation theory (Pletzer et al., 2018; Pruitt & Kimmel, 1977) posits, people are often willing to cooperate if they expect others to cooperate as well. Believing that other actors may prioritize their own personal interest over collective interests may lead people to behave in a non-cooperative way. Therefore, greater cooperative expectations of interacting partners could be essential in promoting cooperation.

Consistent with the Goal Expectation theory, past studies found that higher cooperative expectations encourage individuals to cooperate. For instance, Ng and Au (2016) found that the higher participants rated the cooperative probability of their interaction partner, the more likely that they were to cooperate with this interaction partner. This positive relation was also evident in a meta-analysis by Balliet and Van Lange (2013) on the relation between trust and cooperation. Their analysis, involving 212 effect sizes, indicated a strong correlation (r = 0.56) between cooperative expectations and cooperation.

But how do people form such expectations? Typically, people may form cooperative expectations on the basis of information about the other's cooperative behavior in prior interactions (Bell et al., 2016; Vives & FeldmanHall, 2018). For example, they may base their cooperative expectations on how cooperative the other had been in the past. Within the context of trust research, such specific, person-based expectations are also referred to as personal trust, personalized trust, or knowledge-based trust (see e.g., Acedo-Carmona & Gomila, 2014; Yamagishi & Yamagishi, 1994). However, in many situations, such information is ambiguous or missing. For example, when people encounter a person for the first time or when they do not know who their interaction partner is. This raises the question of how people then, when the most relevant information about another's cooperativeness is absent, form cooperative expectations and make their decisions to cooperate. As research on trust has shown, people then may rely on a more general process that extends beyond the individual partner they can cooperate with. For example, people may rely on generalized trust expectations; the basis for these expectations may be dispositional, cultural or country specific. For example, people high in general trust, or people in high trust cultures may be more likely to expect others to cooperate, and thereby more willing to cooperate themselves (e.g., Yamagishi et al., 1998; Yamagishi & Yamagishi, 1994).

The present work extends these insights by investigating the possibility that—even when specific information about cooperation partners is lacking—people may base their cooperative expectations on procedural fairness information, that is, on how they were procedurally treated (e.g., Colquitt et al., 2005; Tyler, 2017). More specifically, we will argue that people use their own experiences of procedural fairness as a cue to formulate cooperative expectations of others and that they subsequently use these expectations to decide on their own cooperation. Similar to the distinction made in the trust literature, this process may be person-specific or more general. The process may be person-specific when people know that their cooperation partner has treaded them procedurally fair (vs. unfair). The process may, however, also be more general when people can cooperate with a person who was not responsible for their procedural treatment. In both cases, we argue, procedural fairness may promote cooperation.

1.1 | Procedural fairness and cooperation

That people care about procedural fairness, has been well documented in the extant literature on procedural fairness (e.g., Colquitt et al., 2013; Nagin & Telep, 2017; Tyler, 2017). Procedural fairness refers to the perceived justness of decision-making procedures (e.g., processes, rules, mechanisms, etc.) that are used to determine outcomes (Cooney et al., 2016; Thibaut & Walker, 1975; Tyler, 1988, 2017). People value fair procedures and may even accept inequality if this is the result of a fair (e.g., impartial) procedure (Miles, 2014). For instance, in chess, players playing with white can make the first move, and, therefore, have an advantage over players playing with black. In tournaments, organizers have to implement a procedure to determine the players' colors and they typically opt for a chance procedure (e.g., flipping a coin), because such a procedure is unbiased. By using a procedure of chance, chess players are treated procedurally fairly by the tournament organizer and will, therefore, likely accept if they have to play with black.

Previous research demonstrated that procedural fairness can enhance cooperation. Studies on organizational behavior, for example, showed that higher procedural fairness invoked employees to contribute to the welfare of their organization (e.g., Blader & Tyler, 2009; Van Dijke et al., 2012). Similar findings have been obtained in experimental research on cooperation in several types of social dilemmas. For instance, previous studies manipulated procedural fairness by giving participants a possibility to voice their opinion (vs. not providing voice) before confronting them with a public good dilemma (i.e., the decision between serving one's own personal interest or the collective interest), and observed that participants contributed more money to serve the collective interest in the voice (i.e., fair-procedure) condition rather than in the no voice (i.e., unfair-procedure) condition (De Cremer & Van Knippenberg, 2003, study 2).

More directly related to our research, a recent study on cooperation in a chicken dilemma found that participants were more willing to cooperate with a person who had selected a fair procedure in a prior allocation task (i.e., allocating money via a coin-flip procedure) rather than with a person who had selected an unfair procedure (i.e., allocating money via a personal choice procedure) (Sun et al., 2021, study 2). Taken together, the above insights show that procedural fairness can promote subsequent cooperation. Note, however, that these findings do not provide a clear explanation of why procedural fairness and cooperation are positively linked.

1.2 | Procedural fairness as a cue for expected cooperation

We believe that expectations about others may play an important role in the positive link between procedural fairness and cooperation, because procedural fairness may serve as a cue for expected cooperation. This notion can also be derived from research on interpersonal trust, which is defined as the "intention to accept vulnerability based upon positive expectations of the intentions or behavior of another" (Rousseau et al., 1998, p. 395). Lind (2001, p. 67) theorized that fairness cues can be "a surrogate for interpersonal trust", especially when one is lacking information about other people's trust (see also Van den Bos et al., 1998). In line with these insights, research has shown that procedural fairness is positively related to trust in coworkers or supervisors (Colquitt et al., 2012; Lehmann-Willenbrock et al., 2013; Nelson et al., 2019) and organizational trust (Hadi et al., 2020). With cooperative expectations being viewed as positive expectations, these findings imply that procedural fairness information can help people to formulate subsequent cooperative expectations about others, and, thereby, reduce their uncertainty about what to expect from these others (Ashford & Cummings, 1985; Proudfoot & Lind, 2015; Van den Bos, 2001).

Importantly, trust has been found to mediate the effect of procedural fairness on behavioral performance (Colquitt et al., 2012; Zhang & Zhou, 2018), implying that procedural fairness may induce expectations that are then used to decide on one's own behavior. In the context of social dilemmas, this may imply that procedural fairness may induce cooperative expectations which people may then use to decide on their own cooperation.

Note that this theorized impact of procedural fairness cues may also extend beyond settings in which opponents were directly responsible for prior procedures. If people take their procedural fairness experience as a heuristic cue (see e.g., Lind, 2001), it is possible that people will use it to determine whether or not to cooperate with uninvolved

others. As Lind (2001, p. 67) suggested in his formulation of Fairness Heuristic Theory: "The essence of the fairness heuristic process is that fair treatment leads to a shift from responding to social situations in terms of immediate self-interest, which might be termed the "individual mode," to responding to social situations as a member of a larger social entity, which might be termed the "group mode"." If a similar process would operate here, positive procedural fairness experiences could increase cooperation by enhancing positive (cooperative) expectations, even when the opponent was not responsible for the prior procedure.

1.3 | The current studies

To study social decision-making and cooperation, researchers often use experimental games (for a recent overview, see Van Dijk & De Dreu, 2021). Such experimental games allow one to model and study different types of interdependencies, including settings that involve social uncertainty. For the current purpose we used the so-called chicken game. The chicken game provides a formalized framework (Figure 1) that depicts the relative payoffs of various social interactions and, hence, presents a conflict between cooperation and NC. In the chicken game (De Heus et al., 2010; Fort & Viola, 2004; Fukui et al., 2006), two persons simultaneously decide between cooperation (C) and NC to obtain a particular outcome. If both persons opt for NC, this would result in the worst outcome possible for both (i.e., the punishment payoff *P*). If one expects that the other will indeed opt for NC, the best course of action is then to cooperate, because this would result in the second-worst outcome (i.e., the sucker payoff *S*). In contrast, if one expects that the other will cooperate, also opting for cooperation would result in a better outcome than the aforementioned outcomes (i.e., the reward payoff *R*), but the best outcome possible, however, would be obtained if one opts for NC (i.e., the temptation payoff *T*).

Note that the chicken game does not involve a dominant strategy that will always result in the highest outcome no matter what the other person does. For instance, NC is more beneficial than cooperation only if the other opts for cooperation (resulting in *T* instead of *R*, with $T > R$) rather than NC (resulting in *P* instead of *S*, while $P < S$). Thus, in the chicken game, it depends on the other person's cooperativeness whether NC is the most beneficial strategy, and expectations about other's cooperativeness, therefore, play an important role. As a result, the chicken game is ideal for investigating how people formulate cooperative expectations of others, and how it translates to their own cooperative decisions.

In two experiments, we test whether cooperative expectations about a person and subsequent cooperation with that person are shaped by prior experiences of procedural fairness. Building on insights derived from trust research, we investigated whether the process would be person-specific or more general. For this purpose, participants played a chicken game with the person who had been responsible for the procedural fairness experience (Experiment 1), or with a person who had not been involved in the prior procedure (Experiment 2).

In both studies, procedural fairness was manipulated with the same allocation task that was used by Sun et al. (2021, study 2). In this task, participants learned that a certain amount of money would be distributed between them (i.e., the receiver) and another person (i.e., the allocator). The allocator could choose for a coin-flip (fair)

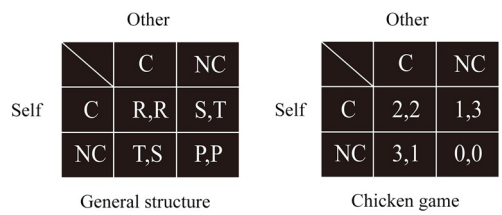

FIGURE 1 Payoff structure for the chicken game. In each cell, the first entry denotes outcomes for Self, and the second entry denotes outcomes for Other

procedure or a personal choice (unfair) procedure to select one of two possible distributions, which were unknown to both the allocator and the receiver. Because a coin-flip eliminates personal responsibility and prevents the effect of personal preferences on the allocation, this chance procedure is experienced as more procedurally fair than the personal choice procedure (Eliaz & Rubinstein, 2014; Keren & Teigen, 2010; Kimbrough et al., 2014; Sun et al., 2021). Cooperative expectations and cooperative behavior were subsequently measured in the chicken game paradigm.

2 | EXPERIMENT 1

In Experiment 1, we examined the effect of procedural fairness on cooperative expectations and subsequent cooperative behavior in the chicken game. The person with whom participants cooperated was the same person who had selected a fair/unfair procedure. Based on our aforementioned arguments, we predicted that a fair procedure would induce greater cooperative expectations which in turn promotes cooperative behavior.

2.1 | Method

2.1.1 | Design and participants

Prior to the experiment, we conducted a power analysis to determine the sample size using G*Power 3.0.10 (Faul et al., 2007). Since there was limited similar work to inform us about the expected effect size of procedural fairness on cooperative expectations and cooperative behavior, we based the sample size on for a medium effect size (*Cohen's* d = 0.6), which we consider scientifically meaningful, as it would imply that the expectation and/or cooperation of a large majority of participants in the fair "coin-flip" condition (i.e., 72.6%) would score higher than the mean expectation and/or cooperation observed in the unfair "choice" condition. To be able to find such a medium effect size with adequate statistical power (1–β = 0.8) and the typical significance level (p = 0.5), we should collect at least 90 participants.

We recruited as many participants as possible in 3 weeks (the time available in the laboratory), with a minimum of 90, through a recruitment platform at XX University. A group of 104 Chinese undergraduates (55 females) in the age range 18–24 years (M = 20.50, SD = 1.71) took part in the study and were randomly assigned to one of the two Procedural fairness conditions (Coin-flip vs. Choice). Participants were paid 9.15 CNY[1] (approximately 1.41 US dollars) on average, with a fixed amount of 5 CNY for part 1 and a bonus of 4.15 CNY on average for part 2 of the experiment.

2.1.2 | Materials and procedure

The general procedure of Experiment 1 is shown in Figure 2. All participants were invited to participate in an experiment on a "social interaction". Similar to Sun et al. (2021), upon arrival to the laboratory, each participant briefly met a same-sex stranger to lend credibility and increase participants' self-engagement. Participants were informed that they would be seated in separate cubicles and interact via a computer network. Afterwards, participants were assigned to a cubicle with a computer, which would be used to provide instructions and record their responses. Participants were randomly assigned to one of the two conditions by the computer program. Participants learned that the study consists of two parts, both of which would determine their final payoff in the experiment.

Part 1. In this part, procedural fairness was manipulated through an allocation procedure that was based on previous studies (Cooney et al., 2016; Sun et al., 2021). Specifically, the participant learned that he/she and another person would each receive a particular share from 10 CNY (worth approximately 1.54 USD).

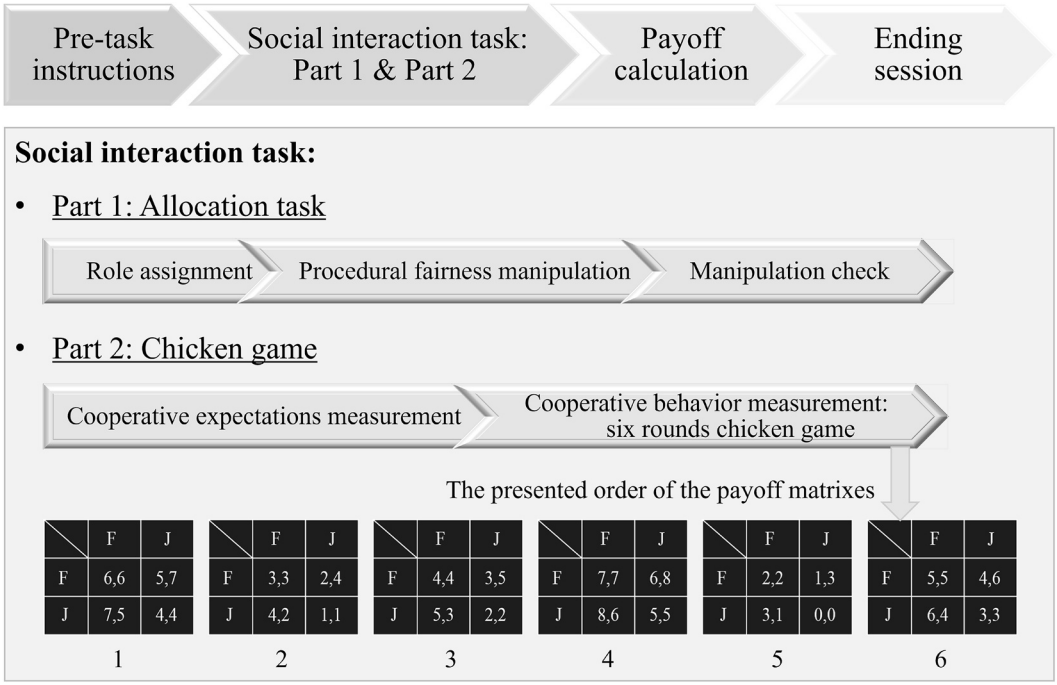

FIGURE 2 The general procedure of Experiment 1

Role assignment. Participants read that there were two sealed envelopes (i.e., A and B), each containing a distribution of the 10 CNY. What these possible allocations were was unknown to both persons. One person (referred to as "allocator") would determine which envelope, and thereby which allocation, would be used. The second person was referred to as the "receiver". All participants then read that, according to the order of registration, the other person was the allocator, and that they would be the receiver.

Procedural fairness manipulation. The participants learned that the allocator could choose between selecting the sealed envelope of the basis of a coin-flip procedure or a personal choice procedure. When opting for the coin-flip procedure, a coin would be flipped and if heads showed, then the allocation would be as stated in envelope A; otherwise, the allocation would be as stated in envelope B. When opting for the choice procedure the allocator had to pick one of the two sealed envelopes. The allocation would then be as stated in the chosen envelope. Participants in the coin-flip condition received pre-programmed feedback that the allocator had chosen the coin-flip procedure, and participants in the choice condition received pre-programmed feedback that the allocator had chosen the choice procedure and thus picked one of the two envelopes him/herself. At this stage, participants did not receive feedback about which envelope was selected and what allocation was in this envelope.[2]

Manipulation check. To check the manipulation of procedural fairness, participants complete the following assessment: "To what extent do you think the allocation procedure selected by the allocator is fair?" (1 = very unfair; 5 = very fair).

Part 2. Similar to Sun et al. (2021), participants learned the rules of the chicken game and that they would perform six rounds of the game with the same person they faced in Part 1. More specifically, participants learned that in each round, they had to select either "F" or "J". Both choice options were associated with two possible outcomes (thus, four in total). Based on the decision of their opponent, who also selected either "F" or "J", they would receive the associated outcome (for an example, see Figure 1). To help participants to understand their task, an example payoff matrix with explanations was shown. Participants also learned that the outcome of one randomly selected round would be paid out as the compensation for participating in Part 2.

Cooperative expectations measurement. After these instructions, participants indicated their cooperative expectations about the decisions that their opponent would make in the 6 rounds of the chicken game. To control for framing effects, half of the participants were asked to indicate how many rounds (out of 6) they expected that their opponent would choose "F" (i.e., the cooperative option), and the other half were asked to assess how many rounds their opponent would choose "J" (i.e., the non-cooperative option).

Cooperative behavior measurement. Next, participants performed 6 rounds of the chicken game, each with a slightly different payoff matrix (see Figure 2) and without feedback about each other's decision in between rounds. Cooperative behavior was computed based on the number of rounds in which a participant chose "F", which could vary between 0 and 6.

After part 2, participants were informed that the allocation in the chosen envelope in Part 1 was "Each person gains 5 CNY". Hence, the payoff for each participant in Part 1 was a fixed amount of 5 CNY. Participants were also informed that for Part 2, the allocator had chosen "F" in each round and the second round was selected for payment. Based on participants decision in the second round, the amount of the payoff from Part 2 was calculated. On average, participants received a payoff of 4.15 CNY in Part 2. So, the final average payoff for participants was 9.15 CNY.

Finally, participants were asked to recall the allocation procedure that the allocator selected with the aim to exclude participants who failed to recall the allocation procedure from the data analysis. After the recall task, participants received their payoff, and then were debriefed and thanked. During the debriefing, participants learned that the decisions by their opponent were pre-programmed.

2.2 | Results

All participants correctly recalled the allocation procedure. Hence, the data of all 104 participants were included in further analyses.

2.2.1 | Manipulation check

An independent *t*-test on the fairness rating was conducted to check the effectiveness of the procedural fairness manipulation. Results showed that participants considered the procedure to be fairer in the coin-flip condition (M = 4.02, SD = 0.75) than in the choice condition (M = 2.42, SD = 0.70), t (102) = 11.22, $p < 0.001$, *Cohen's d* = 2.22, 95% CI = [1.31, 1.88]. These results demonstrated that the manipulation of procedural fairness was successful.

2.2.2 | Cooperative expectations

An independent *t*-test was conducted to analyze the influence of procedural fairness on cooperative expectations. Results showed that participants indicated higher cooperative expectations in the coin-flip condition (M = 3.94, SD = 1.56) than in the choice condition (M = 2.52, SD = 1.59), t (102) = 4.60, $p < 0.001$, *Cohen's d* = 0.91, 95% CI = [0.81, 2.04].

2.2.3 | Cooperative behavior

An independent *t*-test was conducted to analyze the influence of procedural fairness on cooperative behavior. Results showed that participants cooperated more in the coin-flip condition (M = 4.35, SD = 1.77) than in the choice condition (M = 2.60, SD = 1.54), t (102) = 5.38, $p < 0.001$, *Cohen's d* = 1.08, 95% CI = [1.11, 2.40].

2.2.4 | Mediating effect testing

Figure 3 depicts the relation between cooperative expectations and cooperative behavior across the two conditions. To test whether the effect of condition on cooperative behavior was mediated by cooperative expectations, we employed the bootstrapping method for mediation (5000 bootstrap samples, model 4; Hayes, 2013). Results of this analysis (see Figure 4) showed that the direct effect of procedural fairness (Coin-flip vs. Choice) on cooperative behavior (total effect = 1.75, $p < 0.001$, 95% CI = [1.11, 2.40]) remained significant when including cooperative expectations in the model (direct effect = 1.01, $p = 0.002$, 95% CI = [0.39, 1.63]). However, results showed that the indirect effect of procedural fairness on cooperative behavior through cooperative expectations was significantly different from zero ($R^2 = 0.41$, indirect effect = 0.74, 95% CI = [0.39, 1.10]). These results indicated that cooperative expectations mediated the effect of procedural fairness on cooperative behavior.

2.3 | Discussion

Consistent with the findings of Sun et al. (2021), participants considered the procedure of allocating outcomes by coin-flip fairer than the allocation by choice procedure. Importantly, the findings also showed that participants

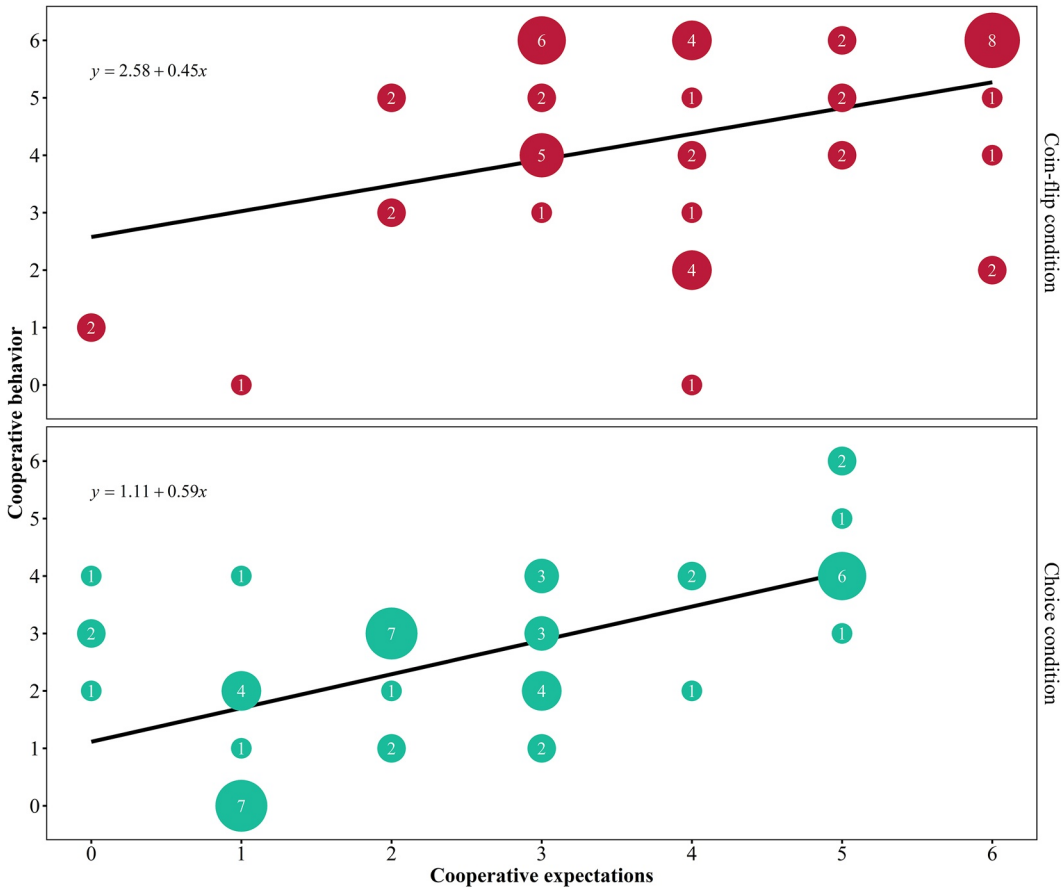

FIGURE 3 The relation between cooperative expectations and cooperative behavior in Experiment 1. The bubble color differentiates the coin-flip condition (red) and the choice condition (green). The bubble size is proportional to the number of participants reported in each condition.

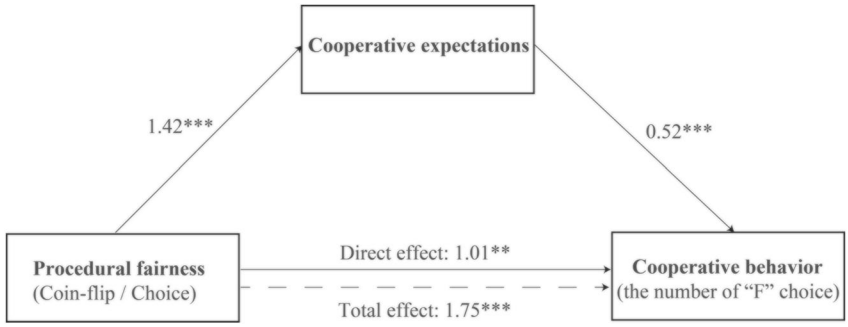

FIGURE 4 The mediating role of cooperative expectations in the association between procedural fairness and cooperative behavior in Experiment 1. $^{**}p < 0.01$, $^{***}p < 0.001$.

expected their opponent to be more cooperative after having experienced the allocation by coin-flip procedure than after the allocation by choice. These expectations, in turn, induced the participants to be more cooperative. Combined, these findings corroborate the proposition that people use procedural fairness information as a cue to form cooperative expectations and guide further cooperative decisions.

Notably, the person with whom participants cooperated was also the one who had selected the fair/unfair procedure. Whether procedural fairness could induce greater cooperative expectations in a generalized manner remains unanswered. In Experiment 2, we tested whether the observed pathway is also at work when participants have to decide whether or not to cooperate with a person who was not involved in the prior procedure.

Besides the focal issue stated above, Experiment 2 also aims to address another feature of Experiment 1. In the experiment, participants responded to the question what decisions they expected from their opponent before making their own decision. This sequence could be a limitation, for instance, because it might have prompted them to first take their opponent's perspective; such perspective taking could influence their decision-making process (Galinsky et al., 2008; Ng & Au, 2016). Experiment 2 first measured participants' cooperative behavior and then measured their cooperative expectations.

3 | EXPERIMENT 2

The main purpose of Experiment 2 was to test whether procedural fairness would also impact cooperative expectations and behavior when the interaction partner was not involved in the prior procedure; and if so, whether the effect would again be mediated by cooperative expectations.

3.1 | Method

3.1.1 | Design and participants

The sample size determination was identical to that of Experiment 1, implying that we again aimed to recruit as many participants as possible within 3 weeks (the time available in the laboratory), with a minimum of 90 participants.[3] A group of 108 Chinese undergraduates (59 females) in the age range 18–24 years (M = 20.23, SD = 1.59) took part in the study and were randomly assigned to one of the two conditions (Procedural fairness conditions: Coin-flip vs. Choice). Participants were on average paid 9.21 CNY (approximately 1.42 US dollars), with a fixed amount of 5 CNY for part 1 and an average bonus of 4.21 CNY for part 2.

3.1.2 | Materials and procedure

The materials and procedure of this experiment were almost identical to those of Experiment 1. In Experiment 2, however, participants were introduced to two same-sex strangers. Participants learned that they would interact with one of them in Part 1 (the allocation task). After Part 1, they learned that they would interact with the other person in Part 2 (the chicken game). Moreover, different from Experiment 1, the cooperative expectations measurement was now included after the cooperative behavior measurement. That is, participants first had to make a choice in each round of the chicken game, and afterwards they were asked to indicate how many rounds (out of 6) they expected that their opponent would have chosen "F" (or "J").

3.2 | Results

All participants correctly recalled the allocation procedure. Hence, the data of all 108 participants were included in further analyses.

3.2.1 | Manipulation checks

Results of the independent *t*-test on the fairness rating showed that participants perceived more fairness in the coin-flip condition (M = 3.93, SD = 0.67) than in the choice condition (M = 2.20, SD = 0.63), t (106) = 13.82, $p < 0.001$, *Cohen's d* = 2.68, 95% CI = [1.48, 1.97]. These results indicated that the manipulation of procedural fairness was successful.

3.2.2 | Cooperative expectations

Results of the independent *t*-test on cooperative expectations showed a significant effect of procedural fairness, t (106) = 4.79, $p < 0.001$, *Cohen's d* = 0.93, 95% CI = [0.75, 1.81], which revealed that participants indicated higher cooperative expectations in the coin-flip condition (M = 3.52, SD = 1.56) than in the choice condition (M = 2.24, SD = 1.18).

3.2.3 | Cooperative behavior

Results of the independent *t*-test on cooperative behavior showed a significant effect of procedural fairness, t (106) = 6.22, $p < 0.001$, *Cohen's d* = 1.21, 95% CI = [1.20, 2.32], which revealed that participants cooperated more in the coin-flip condition (M = 4.69, SD = 1.46) than in the choice condition (M = 2.93, SD = 1.48).

3.2.4 | Mediating effect testing

The relation between cooperative expectations and cooperative behavior across the two conditions, is depicted in Figure 5. We employed the bootstrapping method for mediation (5000 bootstrap samples, model 4; Hayes, 2013) to test whether the effect of condition on cooperative behavior is mediated by cooperative expectations. This analysis (see Figure 6) again showed that the inclusion of cooperative expectations into the model resulted in a significant direct effect of procedural fairness (total effect = 1.76, $p < 0.001$, 95% CI = [1.20, 2.32]; direct effect = 0.89, $p < 0.001$, 95% CI = [0.41, 1.37]). However, results showed that the indirect effect of procedural fairness on cooperative behavior through cooperative expectations was significantly different form zero with 95% confidence (R^2 = 0.75, indirect effect = 0.87, 95% CI = [0.50, 1.23]). These results indicated that cooperative expectations mediated the effect of procedural fairness on cooperative behavior.

3.3 | Discussion

The findings of Experiment 2 were in line with those obtained in Experiment 1. While the opponent in the chicken game was not involved in the prior procedure, we again observed that procedural fairness positively affected cooperative behavior by enhancing cooperative expectations. These findings together with those in Experiment 1 indicated that the relationship between cooperative expectations and cooperative behavior is reliable and positive (cf. the meta-analysis of Balliet & Van Lange, 2013), irrespective of the order of the measurement (i.e., measuring expectations before or after making the decision).

4 | GENERAL DISCUSSION

Converging evidence across two experiments demonstrated the positive effect of procedural fairness on subsequent cooperative expectations as well as cooperative behavior. Moreover, the findings corroborate the view that procedural fairness promotes cooperation because it serves as a cue for people to form expectations about their interaction partner's cooperativeness. This was observed regardless of whether the partner was (Experiment 1) or was not involved (Experiment 2) in the prior procedure.

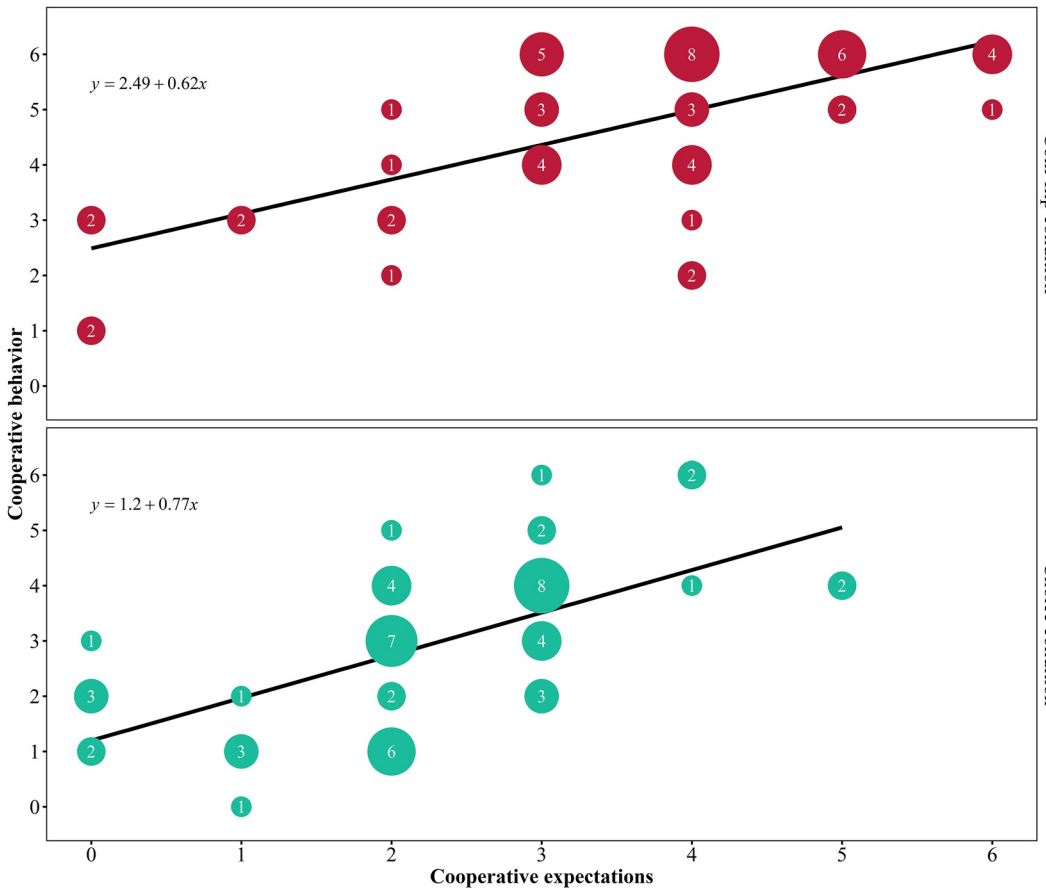

FIGURE 5 The relation between cooperative expectations and cooperative behavior in Experiment 2. The bubble color differentiates the coin-flip condition (red) and the choice condition (green). The bubble size is proportional to the number of participants reported in each condition.

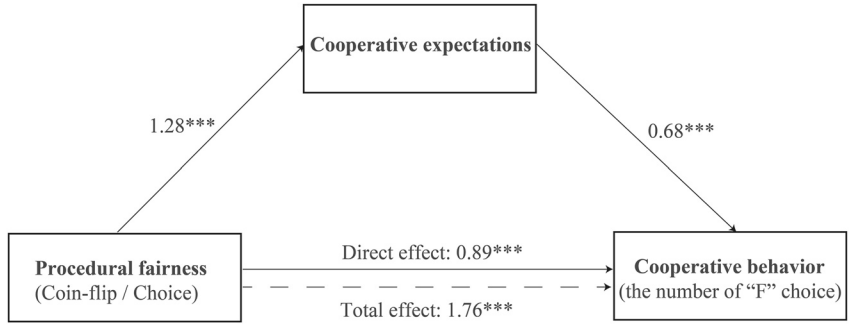

FIGURE 6 The mediating role of cooperative expectations in the association between procedural fairness and cooperative behavior in Experiment 2. ***$p < 0.001$.

As noted, although past research has revealed that procedural fairness is one of the crucial antecedents of cooperation in social dilemmas (De Cremer & Van Knippenberg, 2003; Sun et al., 2021), the underlying mechanism for this relationship was not yet clear. By exploring the role of cooperative expectations in the effect of procedural fairness on cooperative behavior, the current work increases the understanding of how and when people may be likely to cooperate under social uncertainty. Our findings show that participants were more likely to cooperate after having experienced a procedure that they considered relatively fair (i.e., allocation by coin-flip) than after having experienced a procedure they considered relatively less fair (i.e., allocation by choice). Importantly, the fairness of procedures increased cooperation by increasing expectations that others will cooperate. These findings matched prior findings that observed positive correlations among trust (i.e., positive expectations), procedural fairness, and cooperation indicators (e.g., job performance, cooperation intentions) (e.g., Colquitt et al., 2012; Hadi et al., 2020; Nelson et al., 2019). Our research thus provides direct evidence for prior fairness theories suggesting that people rely on procedural fairness information to form expectations and to decide on subsequent behavior when they are uncertain about their interaction partner's cooperativeness (Lind, 2001; Proudfoot & Lind, 2015; Van den Bos et al., 1996).

The current findings highlight the importance of fairness considerations for the forming of cooperative expectations. At a more general level, the findings may connect to literature on person perception. In particular, theory and research on social evaluation have identified several dimensions that carry great weight. In a recent article, Abele et al. (2021) discussed the most studied dimensions. Some of these features relate include elements that are related to fairness. For example, evaluations of warmth (see e.g., Fiske, 2018), communion (see e.g., Abele & Wojciszke, 2007), and morality (see e.g., Ellemers, 2017) are related (but not identical) to fairness evaluations. Our findings that connect procedural fairness to social (cooperative) expectations and cooperation may fit these more general models by highlighting the importance of fairness. It would be interesting for future research to see whether there are other implications as well. For example, the models on social evaluation also suggest that some dimensions have priority over others and that, for example, people react more negatively to those who score low on warmth or morality than to those who score low on agency or competence. A possible avenue for future research could then be to see how procedural fairness information impacts evaluations of other's NC. Such research could, for example, investigate whether people are more willing to sanction noncooperative others after having experienced procedural fair procedures.

At this point it may be interesting to elaborate on the fact that the positive effects of procedural fairness extended to a setting in which participants interacted with a person who was not involved in their prior procedural fairness experience (Experiment 2). Similar to the insights in trust research that distinguish between personalized and generalized trust (e.g., Acedo-Carmona & Gomila, 2014; Yamagishi & Yamagishi, 1994), this suggests that procedural fairness effects are more than person-specific and may generalize to others who had no role in the personal fairness experience. This fits with the notion of fairness heuristic theory (Lind, 2001) that procedural fairness may be used as a cue to generate interpersonal trust and thereby promote cooperation. Also note, however, that this carry-over effect resembles those found in the domain of distributive fairness (i.e., perceived justness in the distribution of resources or outcomes), showing that people are more cooperative after receiving a fair (vs. unfair) outcome, even towards

uninvolved others (Gray et al., 2014; Wang et al., 2019). This suggests that at a more general level, similar processes may be at work. A possible connection could be that a fair (vs. unfair) procedure may—like receiving a fair (vs. unfair) outcome—be considered as kind and fair behavior (De Cremer & Tyler, 2007), which induces individuals more likely to have a general positive view of others and hence, have positive expectations towards others.

It is also relevant to address the issue of causality. Similar to previous accounts, our theoretical framework assumes that people determine their cooperation (at least partially) on the basis of the cooperative expectations they have of others, and that the effects of procedural fairness on cooperation run via the expectations people form. The mediation analyses we presented fit with that account. It should be noted, however, that one could also envisage other paths. One interesting path may be derived from recent research by Doyle (2021) on the role of cultural beliefs about trustworthiness in social dilemmas. Doyle argued that cultural beliefs may promote cooperation because people expect that others will cooperate, but also because they expect that others expect similar behavior from them (see for related ideas on higher order inferences e.g., Correll et al., 2017). One might wonder whether similar inferences could operate in our studies as well such that cooperative participants may have reasoned that their cooperation partner expected them to cooperate as well. We did not test this, but we could envisage such an effect. Whether this would be especially likely after having experienced procedural fairness is an issue that can be tested in future research.

As for the more specific features of our research design, it may also be interesting to further discuss the experimental inductions we used to manipulate the procedure. In all conditions, the procedure could not affect the outcome because whether the allocation was made by chance or by choice, the allocator never knew what was in the envelope. This suggests that there may be something inherently procedurally fair to an explicit chance procedure like a coin-flip (over choice procedure). This might explain why people recommend chance procedures under circumstance like having to choose one of the two things that both are appealing, or settling a dispute between two persons who both want to play first in a game. Future research may further address what exactly it is that makes a chance procedure like a coin-flip appears so procedurally fair. One possibility that we suggest here, is that a chance procedure like a coin-flip to determine which envelope will be opened more explicitly disassociates the outcome from people's preference than a procedure where someone chooses between two sealed envelopes. In this way a coin-flip procedure may be less associated with personal responsibility, which is a proposition that could be tested in future research.

Future research could also benefit from examining other forms of procedural fairness, such as giving people voice (Thibaut & Walker, 1975), or striving for consistent application of rules (Van den Bos et al., 1996). Literature on organizational behavior argues that fair procedures generally symbolize that people are valued and respected by others (Lind & Tyler, 1988), which may also promote cooperation. Given these insights, it would be interesting to examine to what extent self-worth and belongingness can also serve as potential mediators, and to what extent the underlying process (hence, the type of mediation) by which procedural fairness may promote cooperation may be contingent on the specific form of procedural fairness. It is our hope that studies along these lines will further enhance the insight in the intriguing relation between procedural fairness and cooperation.

5 | CONCLUSION

The studies we presented underscore the importance of procedural fairness for promoting cooperation. The effects of being treated fairly or unfairly extend beyond cooperation with those we hold responsible for the procedures used. Moreover, the effects are—at least partly—explained by its effect on how we expect others to behave. In terms of trust, the process we revealed suggest that the experience of being unjustly treated may reduce people's (personalized and general) trust in the cooperation of others, which may reduce their willingness to cooperate. In this sense, procedural unfairness may lead to a self-fulling deterioration of cooperation. On the positive side, the current studies also suggest that by using fair procedures cooperation can be increased. Promoting procedural fairness may then be an effective means organizations and institutions to reach collective goals—not only by communicating respect, but also by fostering positive expectations about others' willingness to cooperate.

AUTHOR CONTRIBUTIONS

Research design was done by Qian Sun and Yongfang Liu. Data collection and analyses were carried out by Qian Sun and Yikang Zhang. Result interpretation and manuscript writing were done by Qian Sun, Welmer E. Molenmaker, and Eric van Dijk collaboratively. All authors contributed to the revision and editing of the manuscript.

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CONFLICT OF INTEREST

The authors state that there is no conflict of interest.

DATA AVAILABILITY STATEMENT

All the materials, data, and syntax associated with this article are available at https://osf.io/52ycx/.

ETHICS STATEMENT

All procedures carried in the current study involving human participants were in accordance with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Additionally, the current study was approved by the ethics review board of East China Normal University.

INFORMED CONSENT

Informed consent was obtained from all individuals who participated in the current study.

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ENDNOTES

[1] Because the study was conducted in China, CNY, the Chinese currency (i.e., the Chinese yuan) was used.

[2] We did not explicitly inform the participants whether the allocator was aware that the procedural decision would be shared with the receiver (i.e., the participant), as we primarily were interested to provide the participant with the procedural decision. One might wonder whether participants would react differently if they would think that the allocator thought the decision would remain private (compared to shared). Our hypothesis would be that in both cases, the personal choice option would be considered more procedurally unfair than the coin-flip option. Nevertheless, it may be good for future research to be more explicit on the information of the allocator, because one would thereby control higher-order inferences ("I know that she knows that I know"; or "I know that she does not know that I know") on the side of the receiver.

[3] We again aimed for a medium effect size (Cohen's = 0.6) of procedural fairness on cooperative expectations and cooperative behavior and did not use the observed effect sizes from Experiment 1 (0.91 and 1.08, respectively). We opted for this procedure because we were not sure whether the effects of procedural fairness on cooperative expectations and cooperative behavior with an opponent who was not involved in the prior experience of procedural fairness (the setup of Experiment 2) would be as strong as with an opponent who was involved in the prior experience of procedural fairness (the setup of Experiment 1).

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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