Peaceful alternatives to asymmetric conflict
Reddmann, L.H.

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Chapter 2 - Resource Transfers Reduce but Do Not Eliminate Conflict

Lennart Reddmann, Ruthie Pliskin, Jörg Gross, Zsombor Méder and Carsten K.W. De Dreu

Leiden University, Zurich University and University of Amsterdam

Author Note

L. Reddmann (https://orcid.org/0000-0002-1482-9739), Social, Economic and Organisational Psychology, Leiden University, Leiden, Netherlands; R. Pliskin (https://orcid.org/0000-0002-3751-6292), Social, Economic and Organisational Psychology, Leiden University, Leiden, Netherlands; Z. Méder (https://orcid.org/0000-0002-0241-9433), Social, Economic and Organisational Psychology, Leiden University, Leiden, Netherlands; J. Gross (https://orcid.org/0000-0002-5403-9475), Social and Economic Psychology, Zurich University, Leiden, Netherlands; C.K.W. De Dreu (https://orcid.org/0000-0003-3692-4611), Social, Economic and Organisational Psychology, Leiden University and Center for Experimental Economics and Political Decision Making, University of Amsterdam, Leiden, Netherlands.

Abstract

When faced with the threat of aggression, a defending party can attempt to "pay off" and appease its attacker through the transfer of resources. Whether defenders make such payments and whether and how resource transfers mitigate aggression and conflict is an unresolved question. Historical anecdote and related experimental work suggest that appeasement and conciliatory gestures can be effective, but also run considerable risk of being exploited. We hypothesized that defenders would make such transfers in the attempt to appease the other party, and that in response attackers would decrease their aggression, reducing overall conflict. Two experiments using an extended version of the Attacker-Defender Contest demonstrate that defenders use resource transfers as an appeasement strategy, expect reduced aggression from the attackers, and, in turn, decrease their own conflict investment. Responses by the attackers were more varied: While conflict investment overall decreased, only some attackers reduced their aggression, others used the transferred resources to escalate the conflict and exploit the defender. Our second experiment reveals that these individual differences are partly explained by attackers' social value orientation, with prosocial attackers being more prone to reduce their conflict investment upon receiving a transfer than selfish attackers. Our findings extend previous work on conflict resolution and bargaining strategies and highlight the critical role of expectations and individual differences. They also suggest that strategic appeasement can be effective in reducing aggression, yet its success is crucially dependent upon a correct assessment of the opposing party's interests and values.

Introduction

Social conflict emerges when individuals or groups invest resources to advance their interests at a cost to those of others. Examples include civil wars, terrorist attacks, or hostile takeovers in business. Anticipating aggressive attacks can lead to protective defense including pre-emptive strikes, thus easily creating cycles of attacks and counter-attacks that are economically wasteful and emotionally taxing at both the individual and collective level (Abbink & De Haan, 2014; De Dreu & Gross, 2019; Halevy, 2012; Jervis, 1979).

To protect against the threat of being aggressed against, individuals and their groups sometimes have alternatives to reactive aggression – they can flee and migrate away from potential aggressors or, counterintuitively perhaps, try to "befriend" or appease potential aggressors with gifts and related payments. Whereas migration is costly but likely to reduce the threat of being attacked, whether and how effective making payments and transferring resources to potential aggressors is remains unknown. There is anecdotal evidence that such transfers happen, and can have appeasing consequences. For long periods in history, for example, states neighboring China paid tributes to Chinese emperors in exchange for not being invaded. Historians attribute long-term regional stability to this system of paying tributes (Kang, 2010). Likewise, at the height of the Cold War between the Soviet Union and the United States, scholars experimented with so-called Gradual Reduction of International Tension: antagonists could be enticed to reciprocate small and one-sided reductions in (nuclear) power, setting in motion a cycle of arms reduction without risking being overpowered (Linskold & Han, 1988; Osgood, 1962). Conversely, however, there is reason to expect such concessions to actually escalate conflict – defenders transferring resources to potential aggressors empower the latter comparatively and reduce the cost of attacking. For example, historians' debate whether Chamberlain's appeasement strategy to prevent Nazi Germany from invading Czechoslovakia in 1938 made it, in fact, easier rather than more

difficult for Hitler to attack Czechoslovakia and, shortly thereafter, Poland (Ripsman & Levy, 2008).

While historical examples suggest that antagonists use appeasement with mixed results, little is known about the use and consequences of resource transfers in more mundane conflict and competitions among individuals or small groups. Our goal here is to fill this void. With two experiments on dyadic contests, we answer two open questions: (i) do agents under threat of attack voluntarily transfer resources to their potential aggressor, and (ii) if they do, what are the consequences of such transfers for conflict dynamics. Our experimental contests involve an attacker and a defender. Attackers can invest resources to capture those of their defender while defenders, simultaneously, can invest resources to prevent attacks to be successful. Prior to the contest, defenders but not attackers can decide to transfer some of their resources to their antagonist. We observe how conflict evolves over time when defenders can (vs cannot) transfer resources to their attacker, whether and with how much defenders transfer to their attacker, whether making transfers has an appeasing effect on attackers, and whether there are individual differences in how attackers respond to their defenders' transfers.

Resource Transfers from an Economic and Behavioral Perspective

The Attacker-Defender Contest models conflicts in which one side invests to capture the other side's resources, while the other side invests to protect its resources from being taken. While investing in conflict is collectively wasteful – resources invested are non-recoverable – it can be in the attacker's best interest to invest in attack (up to some point) and, therefore, in the defender's best interest to invest in defense (for formal analysis of the contest, see Methods; De Dreu & Gross, 2019; Meder, Gross & De Dreu, 2022).

To study the emergence and consequences of transfer payments, we add to the basic attacker-defender contest the possibility for defenders to transfer some of their resources to

their attacker prior to conflict investment. Such payment reduces the defender's resources for defense and increases by the same amount the attacker's resources for attack. Assuming that, as in Standard Economic Theory, attackers and defenders are strictly concerned with maximizing payoff, making transfers should not be observed. A defending party should assume that attackers will act in their own rational self-interest and use transfer payments for attack. Additionally, giving away resources undermines the defenders' ability to defend against possible aggression. Making transfers is thus at odds with selfish payoff maximization among defenders and empowers attackers, which should lead to more rather than less conflict and more rather than fewer victories for attackers.

Relaxing the assumption of strict payoff maximization reveals not only that defenders may transfer resources to their potential aggressors, but also how receiving transfer payments may reduce conflict. As noted at the outset, early work on bargaining and reciprocal tension reduction suggests that small unilateral concessions can be effective in building trust, reducing punitive actions and increasing cooperation (Boyle and Lawler, 1991; Large, 1999, Lawler et al., 1999, Osgood, 1962). For example, Lindskold and Han (1988; De Dreu, 1995) showed that conciliatory messaging can foster cooperation in prisoner's dilemma and bargaining games, and Rubin and Brown (1975) argued that the use of promises in bargaining situations can lead to a general liking for the person making the promises, supporting the idea that conciliatory approaches can be effective in fostering cooperation.

The notion that defender transfers can appease attackers is based on a general norm of reciprocity (Cialdini, 1984; Cialdini & Goldstein, 2004; Gouldner, 1960; Regan, 1971)—attackers may feel compelled to "return the favor" by not attacking. Evidence for this possibility would resonate with extant work using trust games. In the trust game, an investor decides to transfer an amount to a trustee. The amount transferred is tripled, and the trustee can then return any amount to the investor. Whereas it is in the trustee's best interest not to

return anything, ample research has shown that trustees abide by some implicit norm of reciprocity and back-transfer a non-trivial amount (Berg et al., 1995; Chaudhuri and Gangadharan, 2007; Cox, 2004). At both the psychological and neural level such back-transfers relate to the desire to avoid unequal distribution of resources (*viz*., inequality aversion; Bolton & Ockenfels, 2000; Fehr & Schmidt, 1999), adherence to a do-no-harm principle (Baron, 1995; also see De Dreu, Giacomantonio et al., 2019), and an aversion towards violating moral norms and disappointing others (*viz.*, guilt aversion; Battigalli & Dufwenberg, 2007; Charness & Dufwenberg, 2006; Chang et al., 2011).

Experiment 1: Overview and Hypotheses

Experiments as well as anecdotal observations suggest that, in contrast to Standard Economic Theory, individuals defending against possible aggression are willing to "appease" their antagonist by voluntarily transferring them resources. This is Hypothesis 1. Work on trust games and the neural and psychological underpinnings of (not) 'returning the favor' lend support to Hypothesis 2, that attackers receiving voluntary transfer from their defenders invest less in attack than those not receiving such payment. If true, and because investing in conflict is collectively wasteful, we should see that post-conflict wealth is higher when defenders have, versus not, possibilities to transfer resources to their potential attackers. We note, however, that such collective savings particularly favor attackers, who not only waste less on conflict but also receive resources from their defender. Put differently, when transfer payments are made and reduce conflict, attackers might end up wealthier.

We tested our hypotheses by comparing the standard Attacker-Defender Contest (De Dreu & Gross, 2019; henceforth AD-C) with the newly created Transfer Attacker-Defender Contest (henceforth TAD-C). In the AD-C, an attacker and a defender each enter the interaction with an endowment e. Players have to decide how much of their endowment to invest in attack (for the attacker, a) or in defense against such attack (for the defender, d).

While investments are always lost (hence, conflict is wasteful), the non-invested part of the players' endowment *e* may count towards their payoff. If the attacker's investment exceeds that of the defender, i.e., *a* > *d,* the attacker appropriates the defender's remaining endowment and adds it to her own. In contrast, if *d* is equal to or larger than *a,* defenders successfully defend and both players keep their remaining endowments. The attacker's payoff is therefore:

$$\pi_{Att}(a, d) = \begin{cases} e - a & if \ a \leq d \\ 2e - a - d & if \ a > d \end{cases}$$

The defender's payoff is:

$$\pi_{Def}(a, d) = \begin{cases} e - d & if \ a \leq d \\ 0 & if \ a > d \end{cases}$$

The TAD-C is a simple extension of the AD-C. Players go through an additional stage prior to the contest. In this stage, the defender can decide if and how much of their endowment they want to 'gift' to the other party – the amount of transfer *t,* constrained by the defender's endowment ($0 < t < e$). The attacking player is informed about this transfer, and, in the second stage, players proceed to play the AD-C as described. The defender can defend themselves with whatever resources they have left after the transfer in the first stage ($0 < d <$ [*e* - *t*]). The attacker can use their endowment and whatever resources they have received in Stage 1 for investments towards attack ($0 < a <$ [*e* + *t*]). Transfers in Stage 1 are thus risky, with no binding contract guaranteeing that attackers will lower or even avoid increasing their attack investment.

In the TAD-C, the attacker's payoff is therefore:

$$\pi_{Att}(a, d, t) = \begin{cases} e + t - a & if \ a \leq d \\ 2e - a - d & if \ a > d \end{cases}$$

The defender's payoff is:

$$\pi_{Def}(a, d, t) = \begin{cases} e - t - d & if \ a \leq d \\ 0 & if \ a > d \end{cases}$$

Methods

Ethics and Participants. The experimental design and hypotheses were preregistered (https://aspredicted.org/K8D_GJ3) and approved by the Psychology Research Ethics Committee of Leiden University (Protocol #CEP 2021-05-28-xxx-V2-3261). Participants provided informed consent and received full debriefing upon conclusion of the study. We recruited 144 participants (83 female; age M = 29.30, SD = 10.03, range 18–69 years), resulting in 72 experimental dyads.

Experimental Procedures. Participants were recruited using prolific.co from which they were invited to a discord.com server. After they entered the server, the general rules and procedure of the experiment were explained to them, and the experimenter greeted them over a chat box. Once 4 participants had joined the server, they were provided with a link to the experiment. The experiment was designed using oTree (Chen et al., 2016). Throughout the experiment, participants could contact the experimenter over the discord.com chat box for questions.

The 4 participants were randomly assigned to two fixed dyads - playing either the AD-C or TAD-C - and within dyads either to the role of attacker or defender. Participants received extensive instructions on the experimental task, followed by comprehension questions to make sure that every participant understood the rules. All instructions used neutral language to avoid framing effects. Participants would then play the task for 15 trials in which both attacker and defender had 30 MU at their disposal at the start of each round. Between trials, participants received full feedback: In both AD-C and TAD-C, participants learned how much attackers and defenders invested into conflict, what outcome the conflict had, and how much both parties earned. In the TAD-C, participants additionally received

information after Stage 1 of the contest on how many MU the defender had transferred to the attacker and how many MU both parties would have at their disposal at Stage 2. After the main task, all participants completed a series of questionnaires which were collected to answer research questions outside of the scope of the current paper and are therefore not further discussed. Finally, all participants were debriefed.

Participants were paid after completion of the study via the prolific.co platform. Participants received a 7.50 GBP participation fee and an additional performance-based payment. For the main task, the outcome of six randomly selected trials of decision-making were summed and then converted into GBP at a rate of 1 MU = 0.20 GBP.

Results

Main Analysis Strategy. The data from our interactive experiment are hierarchically structured. For our main analysis (unless indicated otherwise), we therefore accounted for the resulting violation of independence of individual data points by fitting random intercept regression models with decisions nested within participants, nested within dyads. Predictors of our main model were *game* (TAD-C/AD-C), *role* (Defender/Attacker), and the interaction term. We performed our analyses using Python for data processing and plotting and R for model fitting (Team, 2016). Linear mixed models were fitted using the lme4 package (Bates et al., 2015) and *p*-values were obtained using the lme4 extension package lmerTest (Kuznetsova et al., 2017).

Main effects of AD-C versus TAD-C. Confirming Hypothesis 1, defenders in the TAD-C made use of the option to transfer in stage 1 of the game, spending on average 1.83 MU (i.e., ~7% of their MU; Intercept = 1.83, *p* < .001; Table 1; Figure 1a) per round. Further analysis revealed that defenders transferred relatively infrequently, with transfers made in 20.12% of trials (approximately every fifth trial; Intercept = 0.20, *p* < .001; Table 1; Figure 1a). However, the "magnitude" of these transfers (calculated by excluding trials with transfer

equal to 0) was substantial with an average of 8.82 MU (approximately ⅓ of the MU at their disposal; Intercept = 8.82, $p < .001$; Table 1; Figure 1a).

Figure 1

Conflict decisions and game-theoretic benchmarks in AD-C and TAD-C
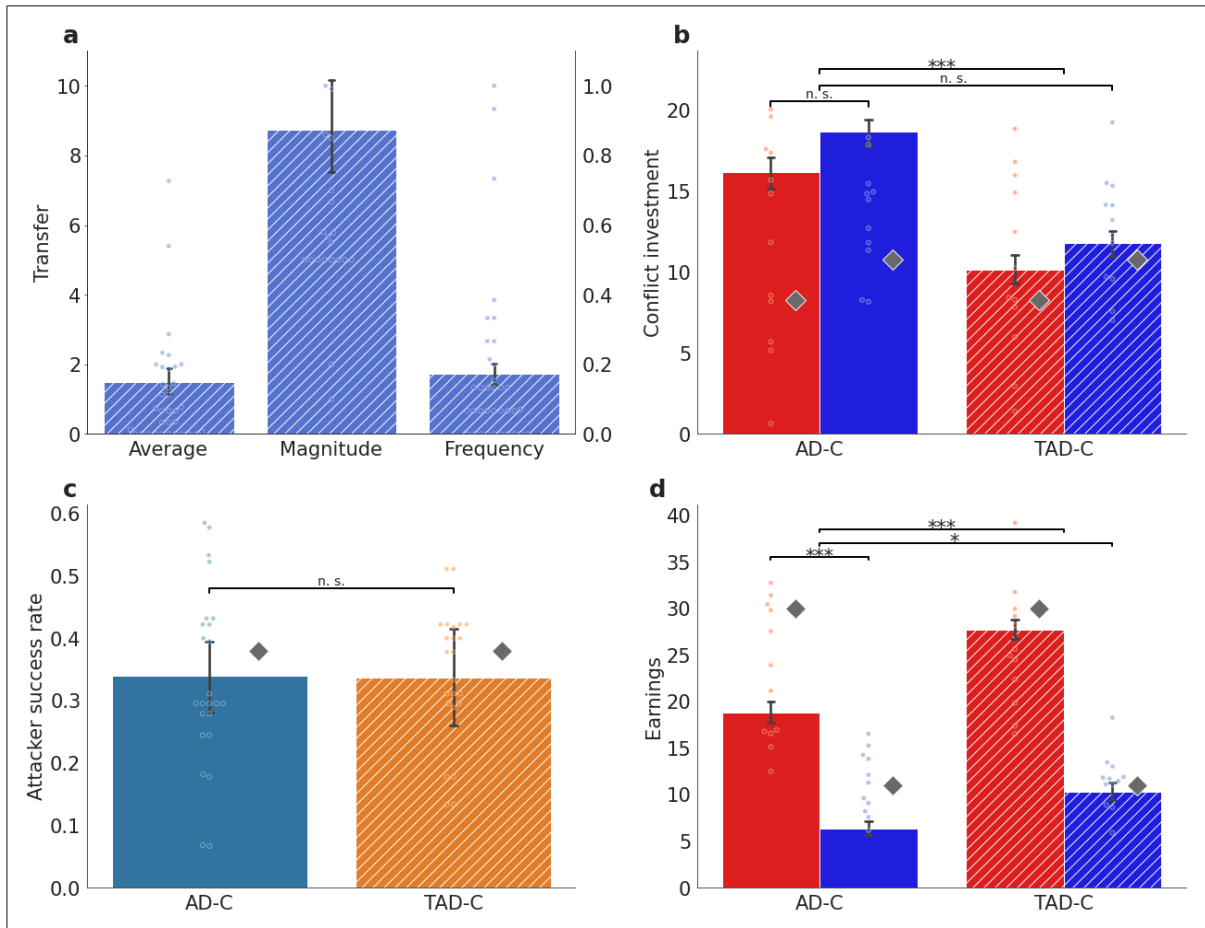
Note. (a) Defenders' average transfer and transfer magnitude (in MU) and transfer frequency, (b) conflict investments (in MU), (c) attacker success rate, and (d) earnings (in MU) in the AD-C (solid) vs TAD-C (dashed) for attackers (red) and defenders (blue). Shown are mean values (bars), standard errors (± 1 SE), aggregated investment by subject (dots), and Nash equilibrium predictions (Diamonds). Contrasts are significant at *p < .05, **p < .01, and ***p < .001.

Table 1

Results of linear random intercept mixed models for defenders in the TAD-C condition predicting outcome variables related to defender transfer (study 1). The intercept estimates the mean difference of these variables from 0.

Dependent Variable	Predictor	Estimate (b)	Test statistic (t)	p
Defender transfer	(Intercept)	1.83	4.31	< .001
Defender transfer magnitude	(Intercept)	8.82	12.12	< .001
Defender transfer frequency	(Intercept)	0.20	4.91	< .001

Note. Estimates for aggregated effect using linear mixed model with random effects *participant* and *dyad*.

In line with Hypothesis 2, a comparison between the AD-C and TAD-C revealed a significant reduction in conflict investment (*Game* coefficient = -5.59, *p* < .001). This effect was independent of role: Attackers and defenders invested similarly less in the TAD-C than in the AD-C (*Game × Role* coefficient = -1.05, *p* = .597; Table 2; Figure 1b). As a consequence, we found no between-game difference in attacker success rate (*Game* coefficient = -0.01, *p* = .810; Table 2; Figure 1c). In other words, while defenders made use of their option to 'appease' attackers, albeit infrequently, and reduced conflict expenditure on both sides, the presence of this option did not reduce the frequency with which attackers successfully exploited defenders.

Due to the savings in conflict spending, both attackers and defenders realized higher earnings in the TAD-C (*Game* coefficient = 8.58, *p* < .001). As anticipated, however, earning disparity favored attackers more in the TAD-C (*Game × Role* coefficient = -4.77, *p* = .040; Table 2; Figure 1d). In other words, whereas both attackers and defenders benefited in their personal earnings from the option of transfer, attackers benefited more. This interaction effect disappeared after subtracting the amount of transferred MU (stage 1) from the attackers'

earnings and adding it back to the defenders' payoffs (*Game × Role* coefficient = -1.72, *p* = .428; Table 2), indicating that the higher earning disparity in the TAD-C are explained by the MU voluntarily transferred by the defenders in Stage 1.

Table 2

Results of linear random intercept mixed models showing how the type of game (AD-C vs TAD-C) and role (attacker vs defender) impacts different outcome variables (study 1).
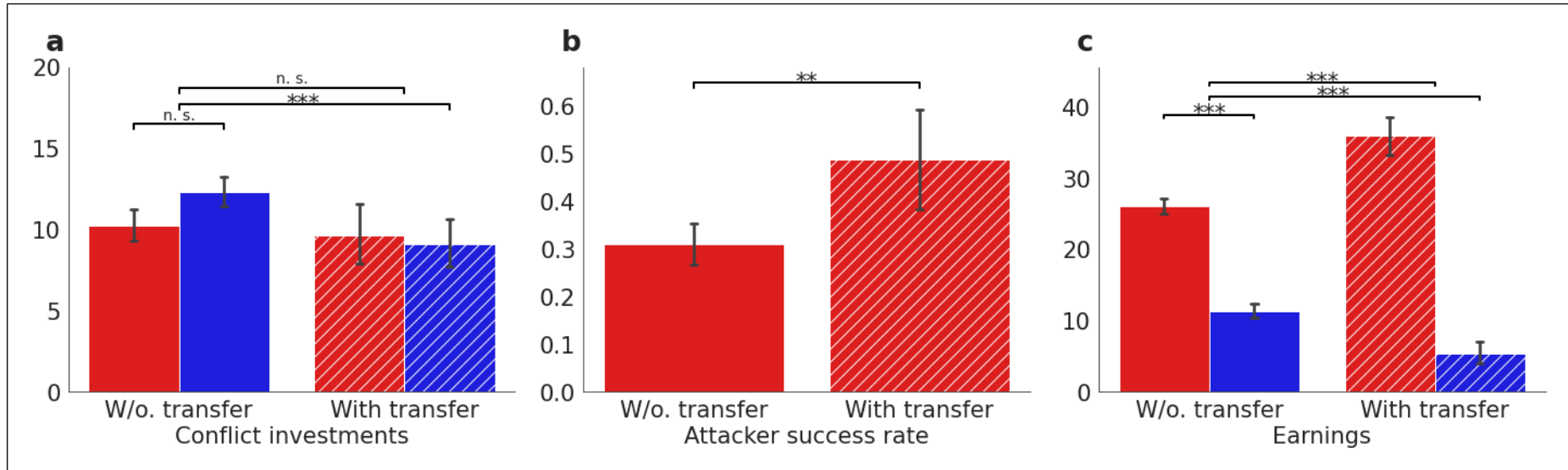
Dependent Variable	Predictor	Estimate (*b*)	Test statistic (*t*)	*p*
Conflict investment	(Intercept)	16.24	13.67	< .001
	Game: TAD-C	-5.59	-3.84	< .001
	Role: Defender	2.60	1.84	.069
	Game × Role	-1.05	-0.53	.597
MU kept	(Intercept)	13.77	11.16	< .001
	Game: TAD-C	7.16	4.59	< .001
	Role: Defender	-2.58	-1.70	.093
	Game × Role	-1.99	-0.93	.356
Attacker success rate	(Intercept)	0.35	12.07	< .001
	Game: TAD-C	-0.01	-0.24	0.81
Earnings	(Intercept)	18.78	14.78	< .001
	Game: TAD-C	8.58	5.20	< .001
	Role: Defender	-12.56	-7.75	< .001
	Game × Role	-4.77	-2.09	.040
Earnings (w/o transferred MU)	(Intercept)	18.78	15.19	< .001
	Game: TAD-C	7.00	4.46	< .001
	Role: Defender	-12.58	-8.19	< .001
	Game × Role	-1.72	-0.79	.428

Note. Estimates for aggregated effects using linear mixed model with random effects *participant* and *dyad*.

Comparing Trials with versus without Transfer. To gain more insight into how the option to transfer reduced conflict spending, we compared trials in which defenders did or did not make use of the transfer option in the TAD-C condition. This showed that defenders substantially lowered their defense spending in trials in which they transferred MU (*Transfer* coefficient = -4.44, *p* < .001; Table 3). Attackers, however, on average did not reduce their aggression after receiving (vs not) any transfer from their defender (*Transfer* coefficient = 0.61, *p* = .587; Table 3; Figure 2a). As a result, attackers on average invested into conflict slightly more than defenders when defenders paid some transfer and were more often victorious and earned more when defenders did transfer resources (*Transfer* coefficient = 0.17, *p* = .006; Table 3; Figure 2b; and *Transfer* x *Role* coefficient = -13.65, *p* < .001; Table 3; Figure 2c).

Figure 2

(a) Conflict investments (in MU), (b) attacker success rate and (c) earnings (in MU) for attackers (red) and defenders (blue) for trials without (solid) vs with (dashed) transfer in the TAD-C

Note. Shown are mean values (bars) and standard errors (± 1 SE). Contrasts are significant at *p < .05, **p < .01, and ***p < .001.

Table 3

Results of linear random intercept mixed models showing the effect of trials with vs without defender transfer, role (attacker vs defender), and their interaction on various outcome variables in the TAD-C condition (study 1).

Dependent Variable	Predictor	Estimate (b)	Test statistic (t)	p
Attacker conflict investment	(Intercept)	10.17	8.54	< .001
	Transfer: With	0.61	0.54	.587
Defender conflict investment	(Intercept)	12.51	12.40	< .001
	Transfer: With	-4.44	-4.29	< .001
Conflict investment	(Intercept)	10.17	9.20	< .001
	Transfer: With	0.60	0.55	.581
	Role: Defender	2.35	1.50	.136
	Transfer × Role	-4.76	-3.17	.001
Attacker success rate	(Intercept)	0.31	9.91	< .001
	Transfer: With	0.17	2.79	.006
Earnings	(Intercept)	26.18	22.56	< .001
	Transfer: With	8.84	6.37	< .001
	Role: Defender	-15.06	-9.18	< .001
	Transfer × Role	-13.65	-7.07	< .001

Note. Estimates for aggregated effects using linear mixed model with random effect *dyad*.

Analysis of Attacker Types. On average, attackers in the TAD-C did not lower their attack spending when defenders made transfers. What cannot be excluded, however, is that this average null-result conceals that some attackers respond to defender transfer with increased aggression and others are appeased and lower conflict investment. To examine this, we classified participants in the role of attacker as "exploitative" if they invested on average more in trials with transfer compared to their conflict investment in trials without transfer, and as "appeased" if they invested on average less in trials with transfer. To probe for consistency in such behavior across trials, we additionally classified attackers as "exploiters", "accepters", and "inconsistent" based on the frequency with which they invested either equal or more *or* less in trials with transfer than their average conflict investment in trials without transfer. Participants who invested as much or more into conflict when they received (vs not) transfers 75% or more of the time (i.e., the third quartile) were classified as consistent "exploiters". Participants who invested less than their without-transfer conflict average in 75% or more the trials (i.e., the first quartile) were labeled as "accepters", and the remaining 50% (i.e., the second quartile) as "inconsistent".

Of the 36 dyads in the TAD-C condition, 13 (36.11%) had defenders that did not make use of the option to transfer at all and were thus irrelevant for our analysis of attacker responses. Using the remaining 23 dyads, 12 attackers (52.17%) were classified as "exploitative", investing on average 6.71 MU more, and 11 attackers (47.83%) were classified as "appeased", investing on average 6.99 MU less in trials with (vs without) transfer. The classification of attackers by response frequency likewise supports a classification into types: 5 "exploiters" (21.74%) consistently invested more in trials with (vs without) transfer, 11 "accepters" (47.83%) consistently invested less, and the remaining 7 attackers (30.43%) were classified as "inconsistent." There was strong overlap between the categories: All 11 "accepters" who frequently invested less in trials with (vs without) transfer

also invested less in conflict on average, while the 5 "exploiters" who frequently invested more in trials with (vs without) transfer also invested more in conflict on average (see Figure 3).

Figure 3

Attacker types in the TAD-C
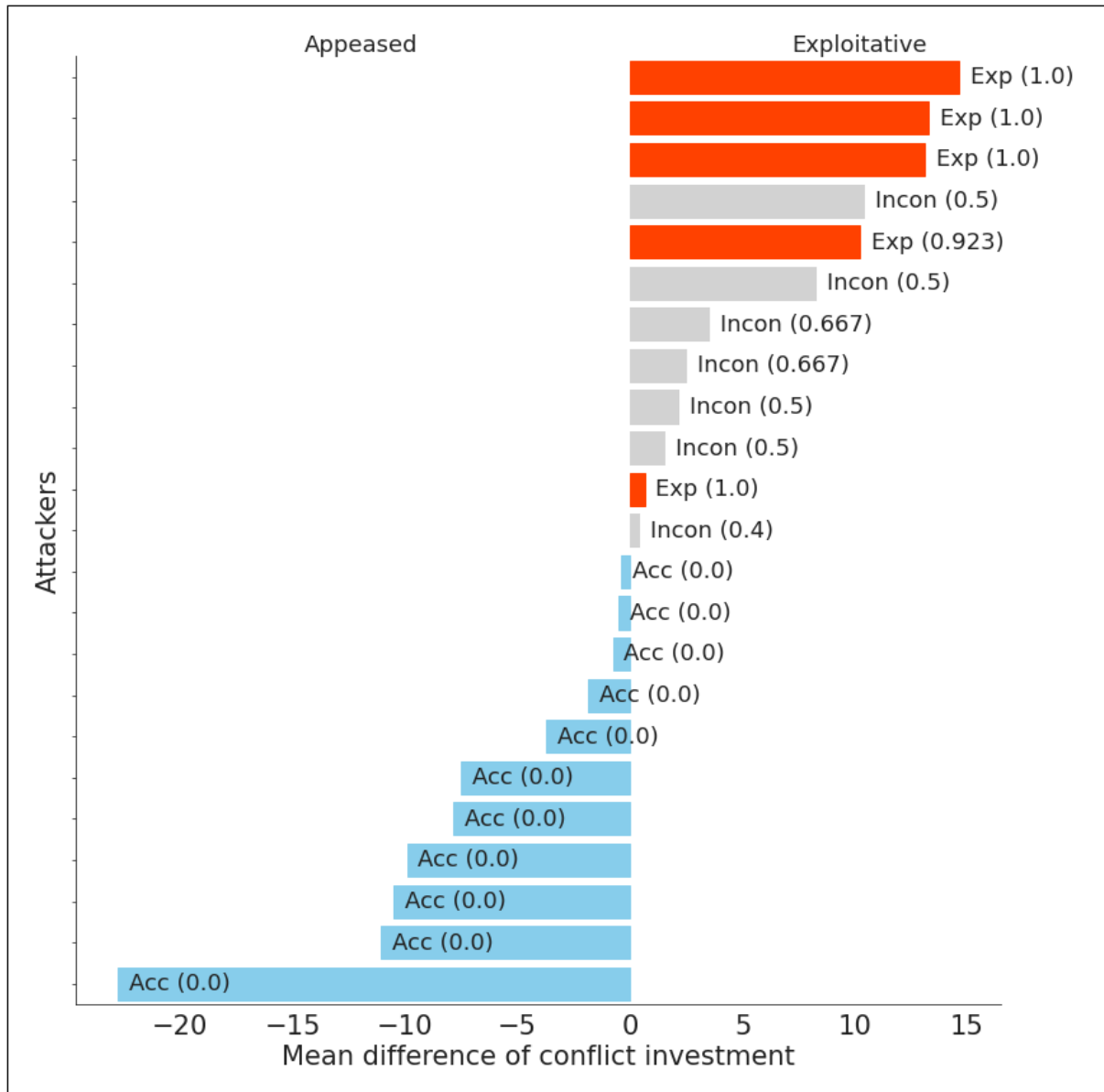
Note. Ordered bar plot displaying the mean difference in conflict investment for trials without vs with transfer for 11 "Appeased" and 12 "Exploitative" attackers. Labels and colors show the classification into "Exp(loiters)" (red), "Incon(sistent)" (grey), and "Acc(epters)" (blue) based on the frequency (in brackets) of investing an equal amount or more.

Discussion and Introduction to Experiment 2

Experiment 1 provided support for Hypothesis 1 that defenders transfer resources to their attackers. We found mixed support for Hypothesis 2 that attackers receiving (vs not) such transfers are appeased and reduce conflict investment. In fact, Experiment 1 revealed that some attackers used transfer payments to further exploit their defenders with increased aggressiveness, while others were appeased by payments and reduced conflict investments, as predicted. This qualified support for Hypothesis 2, born out of exploratory analyses, points to individual differences in social preferences. Our main goal with Experiment 2 was, therefore, to replicate and extend these findings, testing the prediction that attackers with selfish motivation respond to transfer payment with increased conflict investment, whereas those with prosocial motivation respond with reduced conflict investment.

Experiment 2 used a strategy method (Fehr and Fischbacher, 2004, Güth et al., 2001) for both attackers and defenders in which we elicited conditional behavior and manipulated beliefs and expectations (see below). We expected new support for Hypothesis 1 that defenders transfer part of their endowment to the attacker. As observed in Experiment 1, we also expected that defenders lower their conflict investment after making a transfer (vs not) and examined whether this is because defenders making a transfer also expect attackers to become less aggressive (H1a).

Methods

Ethics and Participants. The experimental design and hypotheses were preregistered (https://aspredicted.org/KNM_J9W) and approved by the Psychology Research Ethics Committee of Leiden University (Protocol #CEP 2022-05-06-xxx-V2-4009). Participants provided informed consent and received full debriefing upon conclusion of the study.

We recruited 241 participants (111 female; age M = 38.83, SD = 13.63, range 19–72 years), 120 for the attacker and 121 for the defender condition. Participants were recruited

online using prolific.co from which they were provided with a link to the experiment. The experiment was implemented using the Qualtrics survey platform.

As is common for a sample collected in this way, data inspection revealed erratic response patterns for some of the participants, indicating low-effort or misunderstanding. In the attacker condition, participants were removed if they met either of the following two criteria: investing 10 MU or more than the defenders' remaining endowment after transfer (even though a single MU more than the defenders' remaining endowment would suffice for the attacker's victory) and failing four or more of the comprehension questions on their first attempt, *or* completing the study in less than 14 minutes and 45 seconds (half of the trimmed mean completion time).

For the defender condition, we removed participants if their conflict decisions were in stark contradiction to their expectations of attacker decisions. More specifically, if defenders overinvested 10 or more MU relative to their stated expectation of attacker conflict investment *or* underinvested 10 or more MU relative to their expectation of attacker conflict investment (both responses indicating a lack of effort or understanding since defenders' conflict investment should align with their expectation of attackers' aggression), their responses were excluded. Following these exclusions, our sample comprised 85 attackers and 117 defenders (89 female; age M = 39.22, SD = 13.93, range 19–72 years).

Experimental Procedures. Participants were randomly assigned to either the attacker or the defender condition. After providing informed consent, they received extensive instructions on the TAD-C. Participants learned that they would be paired with another participant in the opposing role after the completion of the experiment and that their pay-off would be calculated based on both their own and the other participant's decisions. All instructions used neutral language to avoid framing effects.

Participants responded to comprehension questions to make sure that they understood the rules of the TAD-C and then made decisions for all items of the strategy method in their condition. In both the attacker and defender condition, participants made decisions for various scenarios, manipulating the chances of being able to transfer MUs to the attacker (e.g., "In this scenario, Participant B's information is that there is a 60% chance that you *cannot* transfer anything and 40% chance that you can choose to transfer MU. You can make a transfer, but Participant B does not know this with certainty."; Ranging from 0%, 20%, …, to 100%). These *chance to transfer*-levels resulted in a 6-item within-participant manipulation for defenders. In the attacker condition, participants made choices conditional on both the *chance to transfer* and 7 levels of transfer, resulting in 36 items. As the *chance to transfer*-manipulation only had small effects on conflict investment and did not affect other results in a meaningful way, we ignore this manipulation henceforth and examine results across levels.

Within each scenario, defenders indicated (i) "how many MU do you transfer to Participant B?" (i.e., transfer pay: 0 MU, 5 MU, …, to 30 MU), (ii) "how many MU do you assign to the Challenge Pool (i.e., defense investment; 0 MU to 30 MU), and (iii) "how many MU do you think Participant B will assign to the Challenge Pool (expected attacker investment; 0 MU to 30 MU). Attackers were asked to indicate, for 7 possible level of transfer from their defender (i.e., 0 MU, 5 MU, …, to 30 MU) (i) "how many MU do you assign to the Challenge Pool (i.e., attack investment; 0 MU to 30 MU) and (ii) "how many MU do you think Participant B will assign to the Challenge Pool? (i.e., expected defender investment; 0 MU to 30 MU).

Following the investment decisions, participants filled out the social value orientation (SVO) slider measure (Murphy, Ackermann, & Handgraaf, 2011) by making six decisions involving the selfish versus prosocial allocation of money between themselves and another

person. Decisions were scored as more prosocial if more money was sacrificed in favor of the other person. For example, in one decision problem, the participant could choose between allocating 100 points to themselves and 50 points to the other person (i.e., the maximal proself option) or 50 points to themselves and 100 points to the other person (i.e., the maximal prosocial option). From participants' responses, an SVO angle can be calculated, with a higher score indicating greater baseline prosociality. After completing the SVO slider measure, participants were debriefed.

Participants were paid via the prolific.co platform. They received a 3.20 GBP participation fee and an additional performance-based payment. For the TAD-C, performance-based payments were calculated based on participants' investment decisions and investment expectations. We selected one decision of each defender and paired it with a decision by a randomly chosen attacker. Since the sample included more defenders than attackers, some attackers were matched with more than one defender. In this case, the attacker's pay-off was calculated based on the defender that they were matched with first. Payoffs were converted into GBP at a rate of 1 MU = 0.20 GBP. For the investment decision, we calculated payoffs according to the rules of the TAD-C. Expectation responses were also incentivized, with participants earning 1 GBP if they correctly estimated how much the other participant would invest in the challenge pool. For the SVO slider measure, participants' performance-based payoff was calculated based on participants' own allocation on one randomly-selected decision and on what participants received from one randomly chosen other participant.

Results

Analysis Strategy. Similar to study 1, we used random intercept models for our analysis to account for possible violation of independence in our data. However, unlike study 1, there was no dyad level in study 2, so we utilized a two-level model with individual

decisions nested within participants. For our analysis, we used the same software packages as in study 1.

Defender Beliefs and Behavior. Confirming our first hypothesis, defenders gave more than zero in 42.56% of all decisions. The majority of non-zero transfer decisions clustered at 5 MU (24.79%), 10 MU (12.99%), and 15 MU (3.58%; Figure 4a). Defenders transferred on average 3.35 MU (intercept = 3.35, $p > .001$; Table 4) with an average transfer "magnitude" (i.e., excluding transfers of 0) of 7.59 MU (intercept = 7.59, $p > .001$; Table 4).

To investigate how defenders' transfer decisions influenced their expectations of attacker aggression and their own conflict investment, we collapsed the data points for levels of transfer larger than zero and compared zero versus non-zero investment decisions. This was done due to the highly skewed distribution of transfer decisions larger than 0 (as described above; Figure 4a). As expected, defenders who transferred (some) MU to the attacker expected the attackers to invest less in aggression (*transfer* coefficient = -1.09, $p = .021$; Table 5, Figure 4b). Hence, defenders believed that making transfers would appease their attacker, and this, indeed, significantly reduced defense investment (*transfer* coefficient = -2.77, $p < .001$; Table 5; Figure 4c), again replicating the findings from study 1.

Figure 4

Defenders' (a) decisions for transfer by amount of MU (in percentage), and their (b) conflict expectation of attackers (in MU) and (c) conflict investment for decisions without (solid) vs with (dashed) transfer in the TAD-C strategy method.
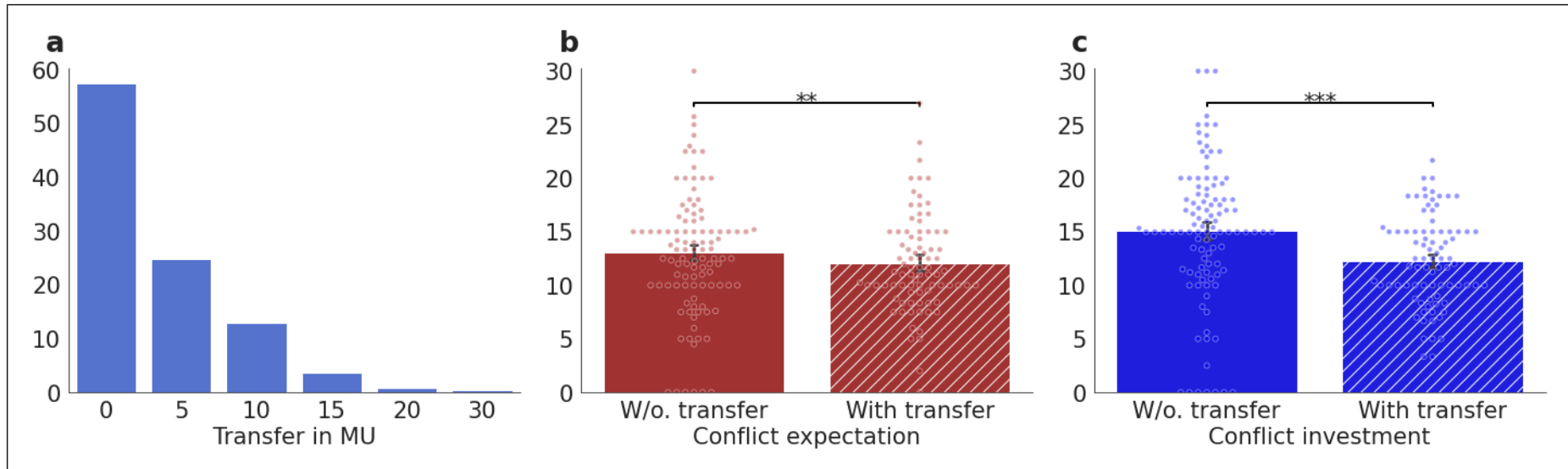
Note. Shown are mean values (bars) and standard errors (± 1 SE). Contrasts are significant at *p < .05, **p < .01, and ***p < .001.

Table 4

Results of linear random intercept mixed models for defenders in the TAD-C strategy method predicting defender transfer and defender transfer magnitude (study 2). The intercept estimates the mean difference of these variables from 0.

Dependent Variable	Predictor	Estimate (b)	Test statistic (t)	p
Defender transfer	(Intercept)	3.35	10.26	< .001
Defender transfer magnitude	(Intercept)	7.59	22.86	< .001

Note. Estimates for aggregated effects using linear mixed models with random effect *participant*.

Table 5

Results of linear random intercept mixed models showing how defenders' decision to transfer (without vs with) impacts various outcome variables for defenders in the TAD-C strategy method (study 2).

Dependent Variable	Predictor	Estimate (b)	Test statistic (t)	p
Defender conflict investment	(Intercept)	15.06	28.12	< .001
	Transfer: With	-2.77	-6.48	< .001
Defender conflict expectation (of attacker)	(Intercept)	13.12	25.14	< .001
	Transfer: With	-1.09	-2.31	.021

Note. Estimates for aggregated effects using linear mixed models with random effect *participant*.

Attacker Beliefs and Behavior. In accordance with hypothesis H2, our regression model revealed a strong decrease in attackers' aggression with increasing levels of transfer by the defender (*transfer* coefficient = -0.29, *p* < .001; Table 6). Further inspection of the relationship between attacker conflict investment and the level of transfer, however, revealed a slight increase in aggression if attackers received 5 MU (from 10.59 MU at 0 to 11.78 MU) and 10 MU (to 11.26 MU) from the defenders. This indicates that attackers partially used their additional resources to aggress and "exploit" the defenders at these lower levels of transfer. This is followed by a steep decrease in conflict investment starting at a transfer level of 15 MU, suggesting that attackers adjust their conflict spending to the decreasing amount of MU that defenders have available for defense.

Classification according to social value orientation showed that our sample consisted of 38 proself and 47 prosocial attackers. A visual inspection (see Figure 5a) of attacker aggression by defender transfer separated by a prosocial versus proself social value orientation showed that prosocial attackers aggressed against defenders less than proself attackers across all levels of transfer. This difference was particularly pronounced for lower levels of transfer (5 MU, 10 MU and 15 MU). To assess these differences statistically, we fitted a random intercept model predicting attacker conflict investment from SVO angle (allowing for a more nuanced analysis of individual differences than SVO type), level of transfer, and their interaction (see Table 6). Indeed, in line with hypothesis H2a, our model revealed a negative effect of SVO angle on aggression (*SVO angle* coefficient = -0.09, *p* = .030), indicating that that attackers with a more pro-social value orientation were more likely to lower their conflict investment when receiving a transfer. We also found an interaction between SVO angle and defenders' transfer (*SVO angle* × *transfer* coefficient = 0.002, *p* = .001), confirming that this moderating effect of prosociality on attacker aggression was more pronounced at lower levels of transfer.

Figure 5

Attackers' (a) conflict investment (in MU) by level of defender transfer, and b) decisions to invest 0 MU into conflict by level of defender transfer, both delineated by prosocial (dashed) vs proself (solid) SVO (collapsed for all chance to transfer-levels)
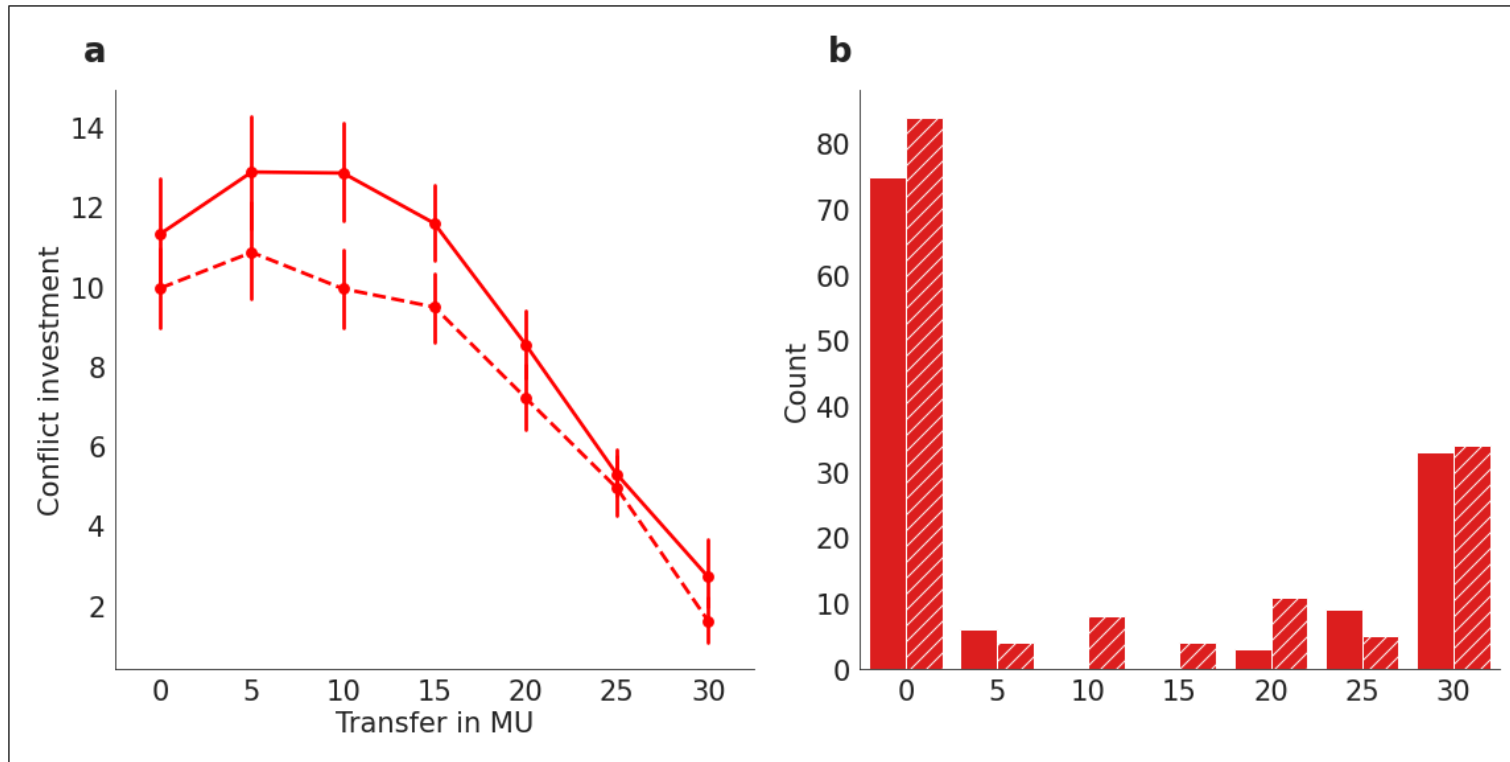
Table 6

Results of linear random intercept mixed models showing how defender transfer (baseline: 0 MU) and SVO angle (baseline: 0°) impacts attacker conflict investment in the TAD-C strategy method (study 2).

Dependent Variable	Predictor	Model incl. main effects			Model w. added interaction effect		
		Estimate (*b*)	Test statistic (*t*)	*p*	Estimate (*b*)	Test statistic (*t*)	*p*
Attacker conflict investment	(Intercept)	14.32	11.90	< .001	15.07	12.30	< .001
	Transfer	-0.29	-30.50	< .001	-0.34	-18.49	< .001
	SVO angle	-0.07	-1.53	.131	-0.09	-2.20	.030
	SVO angle x Transfer				0.002	3.21	.001

Note. Estimates for aggregated effects of *Transfer* (baseline: 0 MU) and *SVO angle* (baseline: 0°) on various outcome variables using linear mixed model with random effects *participant*.

Conclusions and Discussion

In this study, we investigated if and how appeasement in the form of resource transfers could mitigate conflict between an aggressing and defending party. Two experiments demonstrated that defenders indeed transfer a part of their resources to a potential aggressor, confirming our first hypothesis. Moreover, defenders expected the attackers to become less aggressive in response to the transfer, leading them to reduce their own conflict investment. Findings thus provide evidence that resource transfers are employed as a conflict resolution strategy, with defenders expecting to appease the attackers and deescalate the conflict. Our second hypothesis was also supported, but with some complexity. The comparison of the normal Attacker-Defender Contest and its extended version showed that appeasement was indeed successful in reducing aggression and overall conflict. However, it was not universally effective. Closer analysis of the Transfer Attacker-Defender Contest revealed that while defenders reduced their defense spending after transfers, responses from attackers varied: some reduced their conflict investments ("appeased" attackers), while others used transfers to escalate aggression ("exploitative" attackers). Our second experiment therefore used a strategy method to further explore attackers' motives. While attackers generally reduced their conflict investment in response to defender transfers, they also displayed a modest "exploitative" pattern, strategically adjusting their conflict spending based on transfer levels and the defenders' remaining resources. Supporting our hypothesis, we found that prosocial attackers were more likely to respond to transfers with reduced conflict investment, while selfish attackers were more likely to escalate conflict.

Overall, our findings therefore offer a nuanced understanding of appeasement strategies in conflict situations. While defenders made use of the opportunity to transfer resources, leading to an overall decline in attackers' aggression and conflict, we also found

that attackers' responses varied, encompassing both appeasement and exploitation. Crucially, these differing responses were shaped, at least in part, by attackers' social value orientation.

Implications

Our research contributes to the understanding of conflict resolution strategies, specifically to the possibility of using appeasement to prevent potential aggression. Findings connect to earlier work on bargaining strategies and reciprocal tension reduction (Boyle and Lawler, 1991; Large, 1999, Lawler et al., 1999, Osgood, 1962) and research showing the effectiveness of unilateral concessions in building trust and reducing punitive actions (Lindskold and Han, 1988; De Dreu, 1995). Our findings extend and partly support this research by demonstrating that appeasement, in the form of resource transfers, can reduce the aggressors' conflict investments, and overall conflict.

However, our study also introduces a more nuanced perspective on previous theory. Indeed, many attackers "accepted" resource transfers as appeasement and responded by reducing their aggression. This finding resonates with previous work on reciprocity, suggesting that some attackers felt compelled to "return the favor" by not attacking the defender (Cialdini, 1984; Cialdini & Goldstein, 2004; Gouldner, 1960; Regan, 1971). Similar behavior has, for example, been observed in trust games where trustees often abide by some implicit norm of reciprocity and back transfer a non-trivial amount to the trustor (Berg et al., 1995; Chaudhuri and Gangadharan, 2007; Cox, 2004). We also found, however, that appeasement was not universal: Some attackers behaved more in line with predictions made by standard economic theory and exploited the situation by using transferred resources for aggression. As demonstrated in experiment 2, these differences were, at least in part, contingent on individuals' (pro-)selfish orientation. In this regard, our findings echo past experimental work which demonstrates how social value orientation predicts collaborative outcomes in scenarios of conflict and cooperation (see e.g., De Dreu et al, 2019; Thielmann

et al., 2020; Van Lange et al., 2013), and highlight the critical role that individual differences play in these situations.

Contrary to the predictions of standard economic theory, we observed that defenders' made use of the option to appease attackers through resources transfers. Importantly, defenders' decision to transfer resources was linked to their expectation that attackers would reduce conflict investment, and to lowering their own defense spending. This finding is consistent with previous work on trust games, showing that the trustor's decision to transfer resources is influenced by beliefs about the receiver's trustworthiness (Berg et al., 1995; Chaudhuri and Gangadharan, 2007; Cox, 2004), and research on public good games showing that cooperation is contingent on beliefs about other players' willingness to cooperate (Fehr & Gächter, 2000). Consequently, our results underscore the critical role of beliefs and expectation in shaping cooperative decision making in conflictual situations.

Findings may offer some insight for policymakers and negotiators that seek to deescalate real-world conflicts. Our research suggests that strategic appeasement might be a viable strategy for mitigating aggression and preventing conflict. Crucially, however, the choice of appeasement as a strategy should be contingent upon a deep understanding of the opposing party's values and characteristics. In situations where a potential aggressor may be predisposed towards cooperation and overall beneficial outcomes, resource transfers might de-escalate and foster stability. This approach has historical precedent, such as in the Chinese tributary system, where it effectively maintained peace for long periods. However, using strategies of appeasement towards an unabashedly self-serving aggressor may backfire, as in the case of the Munich Agreement of 1938 which further enabled Hitler's aggressive expansion.

Limitations and Future Research

Although our work was partly inspired by historical precedent, we tested our predictions in stylized experimental contests between two individuals. The strength of this approach lies in its internal validity and enables us to draw causal inference about the effects of transfer opportunities in conflicts between an attacking and defending party. While providing valuable insights, this approach might not fully capture the complexities of real-world situations. Factors to think about when generalizing our findings to other contexts include the involvement of multiple parties, group dynamics, conflicts extending beyond the basic roles of attacker and defender, asymmetries in resources and power, and the impact of long-standing, nuanced histories between conflicting parties. Some of these complexities might be addressed through simple experimental extensions. For example, future studies could look at third-party interventionism (cf. Fehr & Fischbacher, 2004; Lotz et al., 2011) or extend our design to a group-based contest (cf. Bornstein, 2003; De Dreu et al., 2016). In addition, future research could further expand our understanding of conflict and appeasement by integrating experimental work with macro-level data (cf. De Dreu et al., 2016; De Dreu et al., 2022).

Our study points to the importance of individual differences, in particular social value orientation, in moderating the response of aggressors towards appeasement. While pro-sociality moderated attackers' aggression, this effect was limited in scope. Even pro-social attackers still used some or their resources to aggress on defenders. Future research could therefore further investigate the role of individual differences by examining other psychological factors that might influence aggression and the response to appeasement. For instance, future research might investigate how traits such as risk aversion, empathy, guilt sensitivity, or dominance orientation affect how individuals behave in this context. Such work

could deepen our understanding of the individual characteristics that shape behavior in conflicts and thus improve our ability to manage and de-escalate real-world conflicts.

Conclusion

Overall, our research provides a nuanced perspective on the dynamics of conflict and appeasement through resource transfers. We found that resource transfers can indeed function as a strategy of appeasement, leading to a decrease in aggression and overall conflict. However, the effectiveness of this approach was not universal, with individual social preferences playing an important role in determining the response to appeasement. Findings do not only contribute to our theoretical understanding of conflict resolution, but also carry implications for real-world conflict management and negotiation practice. Future research might address additional situational complexities and individual differences in order to archive a more comprehensive understanding of human conflict and its mitigation through appeasement.