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Distributive Justice and the Allocation of Costs, Losses, and Profits

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In an experimental study, participants read a scenario about five business partners who sold plants at a flea market. Each partner obtained a different outcome and still had to pay the costs of the partnership. Participants either had to indicate what they considered to be a fair distribution of the costs (given each individual partner's earnings) or what they considered to be a fair distribution of the net results (the total outcome minus the costs). The total outcome was either higher or lower than the costs (i.e., the enterprise resulted in a net profit or a net loss). The results indicate that fairness judgments are affected by the target of distribution. Negative outcomes are distributed differently than positive outcomes, and within the domain of negative outcomes, marked differences are observed between costs and net losses. The results are explained in terms of the differential salience of the distribution of the net result.

KEY WORDS: distributive justice; resource allocation.

In the past, research and theory in the field of distributive justice has predominantly focused on the distribution of positive outcomes. Although this emphasis generated useful theories and concepts, it remained unclear whether results in positive outcomes could be translated to negative outcomes.

The lack of research on negative allocations suggests that many researchers tended to assume that fairness judgments were not affected by outcome allocations (positive or negative) (Törnblom, 1988). Recent research, however, indicates that people may differentiate between negative and positive allocations (for a review, see Törnblom, 1992).

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In the present paper, we present the results of a study on fairness judgments that indicate that negative outcomes are distributed differently than positive outcomes. Building on previous research on the distribution of costs and profits (Messick and Schell, 1992; Harris and Joyce, 1980), we developed a conceptual framework to distinguish between costs, net losses, and net profits.

COSTS AND PROFITS

In order to obtain a positive outcome, costs must be incurred. For example, in order to generate a positive outcome, an enterprise must incur costs such as machinery, labor, etc. Costs, may then, be defined as expenses that indirectly affect the net result. Costs have to be paid to generate a positive outcome, and the net result can be defined as the total outcome minus the costs.

Although there is ample research on how people distribute outcomes, or profits, research on the distribution of costs is scarce. An exception is the research conducted by Harris and Joyce (1980) and Messick and Schell (1992). Both studies employed a similar setup in which participants read a scenario about five business partners that sold plants at a flea market. Each partner had to incur costs that had to be paid (e.g., market fees, booth construction, etc.). After completion of the project, some partners sold more plants than others, and earnings were distributed unequally. Since the total earnings outweighed the costs of the project, the net result was a net profit (the total earnings minus the total costs).

Half of the participants were asked what they considered to be a fair distribution of the net profit. The other half of the participants had to indicate what would be a fair distribution of the costs. That is, participants had to indicate how much each partner should pay even though some partners had earned more than others. Since earnings were distributed unequally, an equal division of the costs implied that profits would be distributed unequally.

Both studies indicated a preference to divide the target equally. Most participants opted for equal division of the net profits and dividing the costs equally, which implies an unequal distribution of the net profit. Messick argued that there is something inherently attractive in dividing targets equally: "Equality acts as simple decision heuristic in tasks that involve the allocation of goods and bads (...) It is a shortcut that is often used without regard to other questions of deservingness or the goals of an allocation." (Messick and Schell, 1992, p. 313; see also Messick 1993, 1995).

Harris and Joyce (1980) and Messick and Schell (1992) focused on the equal division rule and the finding that distributions are, to a certain extent, "not target-dependent." We believe that interpretations that only refer to the heuristic use of equal divisions fall short in explaining and predicting differential distributions of costs, losses, and profits. Therefore, our project focused on the question whether people differentiate in their distribution of costs, losses and profits.

The Messick and Schell study indicated a tendency for costs to be distributed more equally than profits. Furthermore, it was suggested that this finding could be related to "previous findings that costs, burdens, or losses tend to be allocated more equally than gains, benefits, or winnings" (Messick and Schell, 1992, p. 320), thereby referring to two studies by Törnblom and Jonsson (1985, 1987) in which participants tended to favor equality more for negative allocations (withholding bonuses) than for positive allocations (delivering bonuses). This suggests Messick and Schell (1992) interpreted the difference between distribution of costs and profits primarily in terms of the difference between negative and positive outcomes.

In the present paper, we argue that this interpretation obscures an additional difference between costs and profits. Not only do costs differ from profits in the sense that costs are negative outcomes and profits are positive outcomes, an additional conceptual difference is apparent in the procedures of the Messick and Schell (1992) and Harris and Joyce (1980) studies. This conceptual difference is that, when people distribute profits, they are *directly* distributing the final outcomes over all group members. In contrast, by distribution costs, one only affects the final distribution of outcomes *indirectly*; in order to determine how much each person eventually ends up with, the individual's share of the costs should be subtracted from his/her share of the earnings.

To our knowledge, theories on distributive justice do not relate fairness judgments to whether decisions directly or indirectly affect the final outcomes. Recent research on social dilemmas, however, suggests that "directness" may be an important concept for understanding and predicting fairness judgments.

DISTRIBUTIVE JUSTICE AND THE PROVISION OF PUBLIC GOODS

A social dilemma can be defined as a mixed-motive situation where group members share a common interest but the individual interests of the group is at odds with the common interest. Research on social dilemmas focuses on the question as to what extent people are willing to further common interests at the expense of their own interests (For recent reviews, see Komorita and Parks, 1995; van Lange *et al.*, 1992).

Social dilemmas can be observed in many situations, one of which is the provision of public goods. In experimental research on public goods dilemmas, group members can provide a public good if, as a group, they contribute a certain number of endowments. Group members must individually decide how many endowments they will contribute, i.e., how much of the costs of the public goods they will provide.

Several studies investigated what people consider to be a fair distribution of costs when they know that some members of a group have more interest in the public good than others (i.e., when some members will receive more from the bonus than others). Generally, these studies indicated a preference to divide the costs

proportionally, implying that members receiving twice as much from the bonus should contribute twice as much (see Wit *et al.*, 1992). Why did people prefer to distribute the costs proportionally?

Van Dijk and Wilke (1993) explained this preference by discussing the consequences of implementing the proportionality rule. They reasoned that participants opted for the proportionality rule because it allowed them to compensate for the interest differentials: Implementing the proportionality rule led to limited differences in final outcomes. That participants preferred to limit differences in final outcomes was explained by pointing out that, in all previous studies on asymmetric interests and public goods provisions the interest differentials were induced on the basis of a chance procedure and were not related in any way to input differentials.

Indeed, in the case of equal inputs, equity theory predicts that people are motivated to reach an equal distribution of the final outcomes (i.e., the net result) (cf. Walster *et al.*, 1978). As Van Dijk and Wilke (1995) noted, however, in the studies on asymmetry of interest and public good provision, implementation of the proportionality rule did not lead to an *equal* distribution of the final outcomes. It led to *limited* differences, but eventually (after distribution of the bonus and the costs) high interest members ended up with more endowments than low interest members: The net result was distributed unequally. Thus, Van Dijk and Wilke (1995) noted that in studies like that of Wit *et al.* (see also Van Dijk and Wilke, 1993) the preferred distribution of the costs was not in accordance with predictions derived from equity theory.

Van Dijk and Wilke (1995) argued that, in public good dilemmas, the final distribution of the outcomes is not salient enough to evoke a strong preference for an equal distribution of outcomes. In particular, they suggested that when distributing the costs of public goods, group members are mainly focused on the provision of the public good, not on the eventual distribution of outcomes. The crux of their reasoning was that the decision group members had to make—how much to contribute—only affected the final outcomes indirectly through the provision of the public good. Put differently, they suggested that the final distribution of the outcomes (i.e., the distribution of the net result) is less salient when group members have to make decisions that affect the distribution of outcomes indirectly than when their decisions directly affect the distribution of outcomes.

COSTS, LOSSES, AND PROFITS

Van Dijk and Wilke (1995) related their analysis of salience of final outcome distributions to behavioral differences among different dilemmas. It is beyond the scope of the present paper to address the consequences of the Van Dijk and Wilke (1995) study for social dilemma research, however. The aim of the present study is to relate their insights to the field of distributive justice, particularly the question whether people differentiate between costs, losses, and profits. Therefore, we focus on the idea that the distribution of final outcomes is less salient when people have

to make decisions that affect the final distribution of outcomes indirectly than when people have to make decisions that affect the distribution directly.

As already stated, costs can be defined as expenses that *indirectly* affect the net result; the net result can be defined as the total outcomes minus the costs. In line with Van Dijk and Wilke (1995) then, one could expect that the distribution of the net result will be less salient when people distribute the costs of a project than if they distribute the net result (the net profit).

That costs only affect the distribution of the net profits indirectly is apparent in the scenarios used by Harris and Joyce (1980) and Messick and Schell (1992). In these studies, participants either had to distribute the net profit directly (i.e., participants had to distribute the total earning minus the total costs) or indirectly (participants had to distribute the costs given each partner's earnings). We suggest that the final distribution of outcomes (i.e., the distribution of the net result over all business partners) is more salient when people distribute the net profit than when they distribute the costs.

In line with Van Dijk and Wilke (1995) one could expect that when the differential earnings of the five are not related to differential inputs (e.g., when the differential earnings are determined by chance), the net profit will be distributed more equally when people distribute the net result of the project directly (e.g., by dividing the net profit) than if they distribute the net result indirectly (e.g., by distributing the costs).

In the studies of Harris and Joyce (1980) and Messick and Schell (1992), participants had to either divide the costs or the net profit. The reasoning of Van Dijk and Wilke was not restricted to just profitable situations. It may also be applied to projects that result in a net loss. As in the case of a profitable project, the question is how people will distribute the costs and whether the net loss will be distributed differently than when people have to divide the net loss directly or indirectly by dividing the costs. Similar to a profitable project, one would expect that the eventual distribution of the final outcome (the net loss) is more salient when people have to divide the net loss than if they have to divide the costs.

EXPERIMENTAL SETUP AND PREDICTIONS

In order to investigate the possible differences among distributions of costs, (net) losses, and (net) profits, we employed a scenario similar to the one used by Messick and Schell (1992) and Harris and Joyce (1980). Five people participated in a business enterprise of selling plants at a flea market for five consecutive Sundays, with each person selling plants on one of the Sundays.

After the fifth Sunday, the earnings were distributed unequally among the five partners. The differences were due to the unequal number of people attending the flea market on the five Sundays (i.e., the participants learned there was an external cause for the differential earnings). The five partners still have to pay the costs of the enterprise (market fees, booth construction, etc.).

The total earnings either exceeded the costs (i.e., the project resulted in a net profit) or the costs exceeded the total earnings (i.e., the project resulted in a net loss). Participants either had to indicate what they considered to be a fair distribution of the costs (given the fact that the earnings were distributed unequally) or what they considered to be a fair distribution of the net result (i.e., how the five should divide the net profit/loss).

Based on the insights derived from equity theory (Walster *et al.*, 1978; Messick and Schell, 1992), one could expect participants to prefer an equal distribution of the profits/loss. The differential earnings are externally caused, and there is little reason to believe that the inputs of the five partners differed. In this case, equity theory predicts a preference to distribute the final outcomes equally with all partners having equal outcomes. Based on the studies of Törnblom and Jonsson (1985, 1987) one could also hypothesize that participants would show a stronger preference for equal distribution of the net losses than for equal distribution of the net profits.

We reasoned that the distribution of the net result would be less salient if people have to distribute the costs. Research on the distribution of costs in public good dilemmas (e.g., Van Dijk and Wilke, 1993, 1995; Wit *et al.*, 1992) suggests that people prefer to distribute the costs proportionally so that partners who have earned twice as much pay twice as much of the costs. Similarly, one could expect participants distributing the costs in a scenario like the one we employed to prefer the proportionality rule. Proportionality is considered fair because it compensates for differential earnings, even though it does not necessarily lead to an equal distribution of the net profit.

Proportionality may be even more attractive when a project results in a net profit than if it results in a net loss, however. When costs exceed earnings, a proportional distribution of the costs implies that the members who earned the most will suffer the largest losses! Alternative rules, such as equal distribution of costs or a distribution that leads to equal distribution of the losses, seem more appropriate. We do not know about any previous research on cost distributions in unprofitable situations. Based on Törnblom and Jonsson's (1985) reasoning that people want to avoid distributing losses unequally, one could expect people to prefer distributing costs so that it results in an equal distribution of the net loss.

In this paper, we stress that conceptual differences among costs, net losses, and net profits (with respect to "directness") can lead to differential fairness judgments. As we noted earlier, Messick stressed that fairness judgments often reflect a preference for simple heuristics. One of the main advantages of the equal division rule is that it is easy to implement. One only needs to divide the outcomes to distribute by the number of people involved. Alternative rules, such as the proportionality rule, require more elaborate computations. One could hypothesize that the equal division rule is more attractive the more difficult alternative rules—such as the proportionality rule—are to implement.

In order to investigate whether this is plausable, we manipulated the "ease of implementation" of alternative rules, such as the proportionality rule. Individual earnings were either denoted by "simple" numbers, making alternative rules like the proportionality rule easy to implement or by "complex" numbers, making alternative rules difficult to implement (see Harris and Joyce, 1980). Based on Messick's findings (1993, 1995), one could expect participants to prefer equality more in complex number conditions than in easy number conditions (see also Harris and Joyce, 1980).

METHOD

Design and Participants

Result (net profit versus net loss), type of distribution (costs versus net result), and numbers (easy versus complex) were manipulated in a $2 \times 2 \times 2$ factorial design. Participants read a scenario about a business project that either resulted in a net profit or a net loss where they could distribute the costs of the project or the net results of the project. The individual earnings of the five business partners were denoted by "simple" numbers or by "complex" numbers.

PROCEDURE

Subjects were invited to participate in a study on group decision-making. Participants read a scenario similar to the one employed by Harris and Joyce (1980) and Messick and Schell (1992) and were provided with an external cause for the differential earnings of the five partners: Five people would sell plants at a flea market for five consecutive Sundays. Each participant sold plants on one of the Sundays. Person 1 sold plants on the first Sunday, person 2 on the second Sunday, etc. After the last Sunday, the earnings were distributed unequally due to the attendance of the public at the flea market on the five Sundays.

In the *easy numbers* conditions, the earnings of the five were $f100$, $f150$, $f200$, $f250$, and $f300$, respectively (total: $f1000$). In the *complex numbers* conditions, the earnings of the five were $f116$, $f157$, $f214$, $f256$, and $f307$, respectively (total: $f1050$).

In the *profit* conditions, the costs were $f500$ (i.e., the total earnings exceeded the costs, resulting in a net profit of $f500$ in the easy numbers conditions and $f550$ in the complex numbers conditions). In the *loss* conditions, the costs were $f1500$ (i.e., the costs exceeded the earnings, resulting in a net loss of $f500$ in the *easy numbers* conditions and $f450$ in the *complex numbers* conditions).

Participants were asked what they considered to be a fair distribution of the costs of the project (i.e., in the *profit* conditions the participants had to distribute

$f500$; in the *loss* conditions, the $f1500$), or what they considered to be a fair distribution of the net result (i.e., participants had to distribute the net profit or the net loss).

RESULTS

Manipulation Check

We reasoned that alternative rules, such as the proportionality rule, would be more difficult to implement in the *complex numbers* conditions than in the *easy numbers* conditions. After the participants indicated their distribution, we asked participants how easy (1) or difficult (7) it would be to distribute the outcomes in proportion to the individual earnings.

A 2 (result) × 2 (type of distribution) × 2 (numbers) ANOVA only yielded a main effect for the factor numbers ($F(1,156) = 8.0$, $p < .01$): Participants in the complex numbers conditions ($M = 4.2$) considered the proportionality rule more difficult to implement than the participants in the easy numbers conditions ($M = 3.4$). The results suggest that our manipulation of the numbers was perceived as intended.

Allocations

In order to test our ideas concerning the rules people employ, we distinguished three division rules: equal division, proportionality (i.e., a distribution in proportion to the individual earnings of the five), and equality on the other dimension.

Participants had to distribute the costs or the net result. The equal division rule prescribed that the outcomes (costs or net results) should be distributed equally over the five partners. The proportionality rule prescribes that the outcomes (costs or net results) should be distributed in proportion to the earnings of the five. Equality on the other dimension refers to distributions of the outcomes that imply equality on the other dimension (i.e., in the costs conditions: If the costs are distributed in such a way that it leads to an equal distribution of the net result; in the net result conditions: If the net result is distributed in such a way that it implies an equal distribution of the costs).

In order to assess how accurately the distributions our participants made could be described by the three distribution rules, we compared the number of guilders that our participants allocated to each partner (the "actual allocation") with the number of guilders that should be allocated to each partner according to the three distribution rules (the "estimated allocation"). For each distribution rule, we calculated the absolute difference between the actual allocation to each partner and the estimated allocation to each partner. For each distribution rule, we summated these absolute difference measures over the five partners, thereby

obtaining a measure that indicated to what extent the rule accurately estimated the actual allocations of our participants. The higher the score, the lower the accuracy (see Van Dijk and Wilke, 1993, 1995). Since the size of the outcomes differed between conditions, we divided these estimates by the size of the outcomes that had to be distributed (see the Appendix for a more detailed description of the procedure for obtaining these absolute difference measures).

The summated absolute differences (corrected for the size of the outcomes to be distributed) between the estimates of the three rules and the actual allocations of the participants were analyzed as three levels of the (within-subjects) factor rule. A 2 (net result) × 2 (Type of Distribution) × 2 (Numbers) × 3 (Rule) ANOVA with repeated measures on the last factor yielded significant main effects for net result ($F(2,312) = 5.9$, $p < .003$) and type of distribution ($F(2,312) = 186.9$, $p < .0001$). These main effects were qualified, however, by a net result × type of distribution × rule interaction ($F(2,312) = 3.2$, $p < .05$) (see Table I).

Table I indicates that participants who had to distribute the net result (net profit or net loss) predominantly opted for the equal division rule. Table I also illustrates that the preferences of participants distributing the costs were mixed. When the project resulted in a net profit, it appears that participants preferred the proportionality rule over the equal division rule. When the project resulted in a net loss, participants predominantly opted to distribute the costs in such a way that it led to an equal distribution of the net loss (i.e., equality on the other dimension).

The results on the absolute differences between estimated allocations and the actual allocations of participants indicate whether, on average, the distributions of the participants can adequately be described by the three rules. Note, however, that the measures do not indicate whether within conditions some people prefer one distribution rule while other subjects prefer the other. In order to assess preferences for distribution rules more directly, we classified participants as adhering to one of three rules (equal division, proportionality, or equality on the other dimension).

Table I. Absolute Difference Among Estimated Allocations and Actual Allocations for the Three Distribution Rules, as a Function of Net Result and Type of Distribution

	Net result			
	Profit		*Loss*	
Distribution rule	Cost	Net result (profit)	Cost	Net result (loss)
Equal division	$.37^{y}$	$.06^{x}$	$.16^{y}$	$.03^{x}$
Proportionality	$.19^{x}$	$.24^{y}$	$.13^{y}$	$.29^{y}$
Equality on other dimension	$.23^{xy}$	$.51^{z}$	$.06^{x}$	$.62^{z}$

Note: For each column means with a different superscript differ significantly, with Bonferroni correction ($p < .05$).

Table II. Preferences for the Three Distribution Rules as a Function of Net Result and Type of Distribution

	Net result			
	Profit		Loss	
Distribution rule	Cost	Net result (profit)	Cost	Net result (loss)
Equal division	7	34	9	35
Proportionality	12	5	5	1
Equality on other dimension	16	0	25	0

Participants were only classified as adhering to a rule if the summated absolute difference, after correction for the size of the outcomes, was equal to or lower than .05 (for a similar classification of preferences, see Harris and Joyce, 1980). On the basis of this criterium, 91% of the participants (149 out of 164) could be categorized as employing one of three rules.

Table II displays the preferences for the three rules as a function of the net result and the type of distribution. The pattern is similar to the pattern in Table I. Participants having to distribute the net profit or net loss predominantly opted for the equal division rule. A considerable number of the participants distributing the costs of a project resulting in a net loss distributed the costs in such a way that it led to an equal distribution of the net loss (equality on the other dimension). Such a distribution was also employed when the project was profitable. In that case, however, a considerable portion of the subjects opted to distribute the costs proportionally.

DISCUSSION

In his typology of negative and positive allocations, Törnblom (1988) distinguished several types of negative and positive outcome allocations. For example, within the domain of positive allocations, Törnblom distinguished rewards, gains, and profits. Within negative allocations, he distinguished retribution, punishment, losses, and costs. This rationale assumes that conceptual differences can lead to behavioral differences.

We attempted to explore possible conceptual differences between positive and negative outcomes, as well as differences within the domain of negative allocations. As noted in the introduction, in previous research, the conceptual differences between losses and costs were not fully acknowledged. Our focus was on the premise that costs have an indirect effect on the net result. Based on the social dilemma findings of Van Dijk and Wilke (1995), we hypothesized that the distribution of the net result (net loss or net profit) is less salient when people

distribute costs than if they directly distribute the net result. More specifically, we expected that with the scenario we used, the net result would be distributed more equally by participants who had to divide the net result directly than by participants who had to distribute the net result indirectly by dividing the costs.

The results were in line with our expectations. As Table II shows, net profits and net losses were predominantly equally distributed over all five partners: 87% (34 of the 39) of the participants distributed the net profit, and 97% (35 of 36) of the participants distributed the net loss opted for the equal division rule. The distribution of the costs led to a more unequal distribution of the net result. When the project resulted in a net profit (i.e., when the outcomes exceeded the costs), only 46% (16 of 35) of the participants divided the costs in such a way that it resulted in an equal division of the net profit; 54% (19 out of 35) opted for rules that led to an unequal distribution of the profit (of these 19 participants 63% (12 of 19) opted for the proportionality rule and 37% (7 of 19) for the equal division rule). This finding appears to be in line with results obtained in social dilemma research (e.g., Van Dijk and Wilke, 1993, 1995; Wit *et al.*, 1992). When the project resulted in a net loss, 64% (25 of 39) divided the costs in such a way that it resulted in equal division of the net loss; 36% (14 of 39) opted for rules that led to an unequal distribution of the profit (of these 14 participants 36% (5 of 14) opted for the proportionality rule and 64% (9 of 14) for the equal division rule).

Previous research suggests that people prefer to distribute losses more equally than profits (Törnblom and Jonsson, 1985, 1987) and that people consider it to be more unfair to unjustly allocate losses than to unjustly allocate profits (see also Baron, 1995). Our data provide only limited support for this. As Table II shows, participants dividing the net loss did, indeed, predominantly opt to divide the net result equally, but so did participants dividing the net profit. The results presented in Tables I and II suggest, however, that participants distributing the costs showed a stronger preference for a distribution leading to an equal distribution of the net result when the enterprise resulted in a net loss than when the enterprise resulted in a net profit.

The results demonstrate that conceptual differences between costs and (net) losses can lead to behavioral differences. Although the large majority of participants distributed the net loss equally, costs were predominantly distributed unequally. In this respect, the study alerts researchers not to use these concepts interchangeably. The results also demonstrate that the difference between costs and profits is more than just a difference between negative outcomes and positive outcomes. In effect, we observed larger differences between costs and net losses than between net losses and net profits.

Fairness judgments appear to be affected by the type of distribution people have to make. This does not mean that the results of our study are necessarily in conflict with the idea that fairness judgments may reflect preferences for simple heuristics (cf. Messick and Schell, 1992; see also Messick, 1993, 1995). Table II reveals that over all conditions, the equal division rule was preferred over the two

alternative rules. On the other hand, the equal division rule was primarily employed by people distributing the net result (i.e., preferences for the equal division rule were target-dependent). Moreover, our manipulation of the complexity of numbers did not affect fairness judgments. Apparently, preferences were not dependent on the ease of implementation of the distribution rules. It may be questioned, however, whether our manipulation was powerful enough and whether this manipulation was the most appropriate manipulation to investigate the idea that the equal division rule acts like a simple decision heuristic.

An alternative option would be to manipulate time pressure. If the equal division rule is inherently attractive because it simplifies decisions, one could expect a stronger preference for the equal division rule when participants have to distribute the outcomes under time pressure.

Our study was not intended to provide a crucial test of Messick's ideas on the nature of the equal division rule, however. Indeed, evidence suggests fairness judgments may function as simple decision heuristics (see Messick, 1993, 1995). Our study was aimed at increasing our understanding of the distribution of negative and positive outcomes. Although the present study appears to have been successful in this respect, more research is needed to address the limitations of the present study.

In the present study, participants were informed that the differential earnings were caused by external factors, such as the differential attendance of the public on the five Sundays. However, differential earnings are often related to internal factors, such as salesmanship and effort. In this case, it seems appropriate to investigate the possible consequences of the causal structure of fairness judgments. It has been demonstrated that if people are held personally responsible for inequalities, it strongly affects fairness judgments (Törnblom *et al.*, 1991; see also Messick and Schell, 1992).

In a scenario such as the one employed in the present study, one could expect people to prefer a more unequal distribution of the net profit and net loss when the differential earnings are caused by internal factors, such as salesmanship or effort. As in the present study, it may be less clear how people will distribute the costs. Equal division of the costs may become a more attractive (and simple) alternative because implementation of this rule implies that people who earned more should end up with the largest net profits or smallest net losses (depending on the net result of the project). This may be especially true when a project results in a net loss. In the case of a profitable project, people may still opt for the proportionality rule since implementation of this rule (still) implies that members having earned more end up with more of the profits.

Another limitation of the study was that participants were presented a scenario and were not a member of the group facing the distribution problem. It may be informative to investigate the same experimental design in which participants do have to distribute outcomes (costs, net losses, net profits) over their own group. In

this case, participants might show an egocentric bias in their fairness judgments because they are shaped by self-interest (cf. Messick and Sentis, 1983).

We distinguished three rules: Equal division, proportionality, and equality on the other dimension. The results indicate that these three rules adequately described the preferences of the participants. We were able to classify 91% of our participants. In this respect, the present study provides more information about preferences for distribution rules than the studies of Harris and Joyce (1980) and Messick and Schell (1992), which focused on the employment of the equal division rule. For example, the distinction between alternative rules (besides the equal division rule) allowed us to demonstrate that participants preferred distributing costs in profitable situations differently than in unprofitable situations. It may be worthwhile to investigate whether preferences for other rules (e.g., distribution according to need) are also affected by the type of distribution people have to make.

In conclusion, the study shows that conceptual differences among costs, losses, and profits can be related to behavioral differences. Fairness judgments are not only affected by the valence of positive versus negative outcomes, marked conceptual and behavioral differences were observed within the domains of positive and negative outcomes. In this respect, the present study underscores the importance of building a conceptual framework that allows us to distinguish between different types of positive and negative outcomes.

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APPENDIX

Absolute Difference Measures

Participants had to divide a certain number of outcomes (O) (either the costs or the net result) over the five partners. For each participant in our study, we calculated the absolute difference between the actual allocation to partner $i(x_i)$ and the estimated allocation to partner $i(\hat{x}_i)$. This measure was summated over the five partners and corrected for the size of the total outcomes: $\text{abs}(\sum(x_i - \hat{x}_i))/O$. Estimated allocations of the three distribution rules are:

Equal Division

The equal division rule prescribes that the outcomes (O) should be divided equally over the five partners, $\hat{x}_i := O/5$.

Proportionality

The proportionality rule prescribes that the outcomes (O) should be divided in proportion to the individual earnings each partner $i(Y_i)$ where $\hat{x}_i := (Y_i / Y)^* O$ and $Y =$ total earnings of the five partners.

Equality on Other Dimensions

According to this rule, the distribution of the outcomes (O) should imply equality on the other dimension, $\hat{x}_i := (Y_i - Y/5) + (O/5)$.

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