CHILDREN'S CONCEPTIONS AND USE OF RULES OF DISTRIBUTIVE JUSTICE

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Two different approaches to the subject are distinguished: the equity approach and the cognitive developmental approach. In these approaches five kinds of data are used: hypothetical reward-divisions, real-life divisions, arguments used to defend hypothetical reward-divisions, arguments to defend real-life reward-divisions and real-life supervisor-divisions. In the reward-divisions few age trends have appeared in previous studies, while in respect to the arguments six developmental stages have been found. In the theoretical part of this article, it is argued that the lack of age trends in the reward-divisions may be caused by the use of suggestive instructions in many of the studies. Furthermore it is argued that when studies with suggestive instructions are excluded, the remaining studies agree in the following way: 4 and 5 year-old children argued and divided in a self-serving way, while many 6 and 7 year-old children argued and divided according to an equality rule. Most of the older children divided rewards according to equality, while their arguments were more differentiated. In the empirical part of the article a study is described about relations between hypothetical arguments, real-life arguments and real-life division behavior. High relations between the age trends in the three measures were found. The relation between reward-division trends and argument trends in 7 to 11 year-old children has not been found before. In the discussion this result is attributed to a difference in the ease with which equal solutions were obtainable in this study and previous ones.

To study a child's conceptions of fair division, previous investigators employed one of the following kinds of data: (a) divisions of rewards between the child itself and another child (real-life divisions); (b) divisions of rewards between other children (real-life-supervisor divisions);

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(c) divisions of rewards between hypothetical (non-existing) children, *e.g.* after hearing a story or dilemma (hypothetical divisions); (d) arguments the child uses to defend its divisions of rewards between hypothetical children (hypothetical arguments); and (e) arguments the child uses to defend its divisions of rewards between itself and other children (real-life arguments).

The kinds of data an investigator uses, depend on his theoretical position. Two theoretical schools seem to exist concerning the development of conceptions about fair division. One group of researchers, mainly social psychologists, might be called the 'equity group'. The adherents of this group look for developmental antecedents of the equity norm (Adams 1965), which adults use when they divide rewards. This equity norm states that investments and profits of people in comparable circumstances should be in balance. The other group might be called the 'cognitive developmental group'. This group's adherents extend the work of Piaget (1932) on moral judgment. Children's conceptions of fair divisions are inferred from their reasoning about hypothetical dilemmas.

On the whole, the data of the equity group have been the real-life divisions (a and b) and the hypothetical divisions (c). The main data of the cognitive developmental group have been hypothetical arguments (d) and real-life arguments (e).

This article aims to bridge the gap between the two research groups, both on the theoretical and on the empirical level.

The equity approach

Streater and Chertkoff (1976) recently distinguished three different research paradigms in the equity studies of fair division: the participant paradigm, the supervisor paradigm and the bargaining paradigm. In the participant and the bargaining paradigms real-life divisions are used as data and in the supervisor paradigm both real-life-supervisor divisions and hypothetical divisions are used. In all three of these paradigms, the experimenter induces a difference in productivity between the (real or hypothetical) children working together on a task (*e.g.* pasting stars on a piece of paper). This productivity-difference is manipulated by the experimenter by varying the number of stars a child pastes. The child's conceptions of rules of fair division are inferred from the reward-divi-

sions it proposes afterwards. Four kinds of responses¹ are found: (a) equity responses (the child proposes more rewards for the more productive child); (b) selfinterest responses (the child proposes more rewards for itself though it produced less than its partner); (c) equal responses (the child proposes exactly the same number of rewards for both children); and (d) intermediate responses (the child proposes more rewards for itself when it produced more, but proposes an equal division when the partner produced more).

No consistent picture emerges from the many empirical studies in the equity approach: some researchers report age trends in the given responses (*e.g.* Leventhal and Anderson 1970); but some other researchers did not find age trends (*e.g.* Streater and Chertkoff 1976). Some report a preference for equal divisions in children (*e.g.* Morgan and Sawyer 1967); others, however, report a preference for equity divisions (*e.g.* Leventhal *et al.* 1973).

Two recent studies demonstrated the importance of differences in instructions: Lerner (1974) showed that an emphasis on the co-operative character of the task leads to an increase of the number of equal divisions (*e.g.* 'remember you are one team'). Nelson and Dweck (1977) showed that an emphasis on the relation between the productivity difference and the rewards leads to an increase of equity responses (*e.g.* 'remember you pasted only three stars and your partner seven; three and seven is ten and you have to divide these ten stickers').

These two studies inspired the present authors to re-examine the instructions used in the previous equity studies. This analysis led to interesting results (see table 1): in studies where the instructions emphasized the relation between the productivity differences and the rewards, age differences were not found; differences in the children's responses were dependent on whether or not emphasis was laid on co-operation. Thus, when the instructions did not emphasize co-operation, children gave equity responses; when the instruction emphasized co-operation, children gave intermediate responses.

Other studies employed instructions that did not emphasize the relation between the productivity differences and rewards. In these studies

¹ These four kinds of responses are not found in all studies. Most studies only looked for equality and equity responses. Self-interest and intermediate responses can in most cases only be inferred in an indirect way by comparing the responses of different subjects in different conditions.

Table 1

Summary of results of earlier studies in relation to the type of instruction.

Type of instruction		Results
1. Relation between productivity difference and possible reward difference emphasized (R)	Co-operation emphasized (C)	No age trend. Intermediate responses (<i>e.g.</i> Lerner 1974; Streater and Chertkoff 1976)
2. (R)	Co-operation not emphasized ($\bar{C}$)	No age trend. Equity responses (<i>e.g.</i> Nelson and Dweck 1977; Anderson and Butzin 1977)
3. Relation between productivity difference and possible reward difference not emphasized ($\bar{R}$)	(C)	Consistent age trend: from self-interest to equality (<i>e.g.</i> Leventhal and Anderson 1970; Morgan and Swayer 1967; Lane and Coon 1972)
4. ($\bar{R}$)	($\bar{C}$)	Only one study with one age level (Nelson and Dweck 1977)

a consistent age trend showed up: the youngest children made self interest responses while the somewhat older children (6–11 years) chose equal divisions of the rewards (*e.g.* Leventhal and Anderson 1970; Lane and Coon 1972; Benton 1971; Streater and Chertkoff² 1976).

In our view only the latter instructions are acceptable. The former instructions make it too obvious for the children which response the experimenter expects;³ their use in experiments therefore reveals a perception of social desirability rather than underlying conceptions of fair division rules.

² Only the bargaining condition. The other conditions also employed suggestive instructions.

³ Some investigators employed these 'wrong' instructions because they were interested in young children's ability to divide rewards according to the equity formula. This is, in our view, hardly a relevant research-question. Recently, Anderson and Butzin (1977) showed that even four-year-old children are able to divide rewards in an equitable way.

The cognitive developmental approach

The pioneering study into fair division concepts using this approach has been done by Piaget (1932). He used hypothetical reward-divisions as data and he concluded that there are three age-periods: 5 and 6 year-old children divided the rewards in a selfserving way, 7 to 11 year-old children had a preference for equal divisions, and older children took extenuating circumstances into account (Piaget called their responses equity responses but he meant something rather different to the fore-mentioned equity responses).

The most elaborate studies into fair division concepts in this approach have been done by Damon (1973, 1975, 1976). Inspired by Kohlberg (1969), he used hypothetical arguments and real-life arguments as data. He confronted 4 to 10 year-old children with dilemmas such as the following: a schoolclass of children sold their paintings at a fair. How should the earned rewards be divided? Why? Should the best behaved child get more money (or ice-cream)? Why? Should the children who made the most paintings get more money? Why? What is the fairest way to divide the rewards? Why? (*etc.*). On the basis of the reasoning of the children in response to these and other questions and dilemmas, Damon concluded that there are six stages representing different mental confusions: (1) the stage 0-A children (4, 5 years) confused in their reasoning fair divisions with their own wishes and desires (*e.g.* 'I give him more ice-cream' Why? 'Because I want to'). (2) The stage 0-B children (4, 5 years) confused fair divisions with other types of division which can be made (*e.g.* 'She should get the most, because she is a girl and I am a girl too'). (3) The stage 1-A children (6, 7 years) confused fair divisions with strict equal divisions (*e.g.* 'Everyone should get the same, it is not her fault that she is lazy'). (4) The stage 1-B children (6, 7 years) confused fair divisions with divisions according to merit (*e.g.* 'Children that made more paintings should get more money, because they worked harder'). (5) The stage 2-A children (8–10 years) coordinated the different claims (merit, need, equality, extenuating circumstances) and chose compromise solutions (*e.g.* 'He should get somewhat more but not too much, because she deserves some too although she was lazy'). (6) The stage 2-B children (8–10 years) decided for one or more of the different claims in view of the particular situation or the function of the reward in that situation (*e.g.* 'If you don't give more to the best performing children, they will not work so hard the next

time'). Damon (1975) found very high correlations between stagescores and age (0.85) and various cognitive measures (*e.g.* classification, perspective taking).

In another study Damon (1976) investigated children's real-life arguments. He asked children of 4 to 10 to make bracelets for poor children. After the bracelets were made, he interviewed the children individually about the best division of the rewards and afterwards the children bargained over this division. The same reasoning stages as for the hypothetical situations were found.

Comparison of the results of different measurement-procedures

In the cognitive-developmental studies discussed here, a clear developmental trend has been found. Simplifying this trend somewhat, it might be described as a trend from a predominance of self-interest considerations in the youngest children to a predominance of equality considerations in somewhat older children, a predominance of equity-considerations in still older children and mainly compromise solutions in the oldest children. This trend partly corresponds to the trend found in those 'equity'-studies where instructions did not emphasize the relation between reward and accomplishment: here too, self-interest responses have been found in younger children (4, 5 years) and equality responses in older children (6 to 11 years). This correspondence is, however, only partial, because in the equity studies no predominance of equity- or compromise-responses has been found for the age groups older than 7 years.

Some investigators directly compared responses and age trends elicited by different measurement procedures. In three studies real-life divisions and real-life-supervisor divisions were compared (Lerner 1974; Streater and Chertkoff 1976; Nelson and Dweck 1977). In two of these, differences were observed between the responses elicited by the two measurement procedures. Since these studies may well be confounded by social desirability effects, these differences should not be taken too seriously. In one study hypothetical arguments and real-life arguments were compared (Gerson and Damon 1975b). These authors report a very high correlation between stagescores based on hypothetical arguments and stagescores based on real-life arguments. Furthermore, they report an absolute difference between the two stagescores in

such a way that the hypothetical scores were higher than the real-life scores. Their number of subjects, however, was rather small ($N = 24$).

In only one study were age trends based on reward-divisions and age trends based on arguments compared (Damon 1976). In regard to the real-life divisions the same trend appeared as in the equity studies: the youngest children divided the rewards in a self-serving way and the older the children, the quicker they reached equal solutions when they were bargaining over the division of the rewards. As already discussed above, the age trends based on the real-life arguments corresponded to the age trends based on the hypothetical arguments. A direct comparison between division-trends and argument trends is missing in the article, presumably because the reward divisions lacked differentiation. This last conclusion is, however, rather speculative since Damon only distinguished equal and unequal divisions. Perhaps some of the unequal divisions were in our terms altruistic or equity divisions.

Summarizing the results of these various approaches the following statements seem possible: (a) exclusion of those equity studies that employed poor instructions leads to a consistency in the results of the remaining studies; (b) this consistency demonstrates a trend in young children's divisions and arguments from self-interest to equality and a difference between the equality divisions of 7 to 11 year-old children and their equity and compromise arguments; and (c) besides the forementioned difference between divisions and arguments, a difference was observed in the absolute level of hypothetical and real-life arguments.

The aims of the present study

The aims of the present study were to examine the relations and differences in age between hypothetical and real-life arguments and between real-life divisions and hypothetical arguments: are hypothetical arguments of a higher level than real-life arguments as suggested by Gerson and Damon (1975b)? Can the consistency between divisions and arguments in 4 to 7 year-old children also be found when real-life divisions are compared with hypothetical arguments? What are the relations between real-life divisions and hypothetical arguments in 7 to 11 year-old children?

Method

Subjects

The Ss were 84 lower- and middle-class children of a preschool and an elementary school in Nijmegen. The ages of the children ranged from 4 to 11.

All children were individually interviewed about their conception of fair divisions by presenting them with hypothetical dilemmas and asking questions about their solutions to these dilemmas. All children also participated in a real-life division task. Half of the Ss first participated in the real-life task and were interviewed one or two weeks later, for the other Ss this order was reversed. The second author administered both the real-life task and the interview. In the real-life task an assistant was present to keep the remaining children busy when one of them was individually interviewed by the experimenter (in a separate room).

In the interview two dilemmas and a sharing problem were presented. The first dilemma and the sharing problem were adopted from Damon (1975). The second dilemma was a new one. The first dilemma was about a schoolclass of children who sold paintings and drawings to their parents at a fair. The problem is how to divide the earned money. Should the children who made the most paintings get more money than the others; should children who made the prettiest paintings get more? What about the lazy kids and the poor ones? Why? Do you think it fair if one child gets more than another? Why? What should be given to Peter, who was ill at the day the paintings were made? (*etc.*) The second dilemma was about a class that collected all sorts of materials (*e.g.* leaves) to make a beautiful item. The same sort of questions as in the first dilemma were posed. After every answer given by the child, the investigator always probed for the reason the child had to give that answer. By posing the questions, several criteria that might count in a division situation were suggested to the child. The sharing problem consisted of questions about letting your friend play with your toys and their obligation to let you play with their toys. In the real-life task (adopted from Damon 1976) three Ss are brought to a table on which materials for making bracelets have been placed. The experimenter tells the children that she is studying the way children of different ages make bracelets (Damon told the children in his study that the bracelets were for poor children. We, however, did not want to lie to our sub-

jects, especially not in a study about moral behavior). As soon as one child has made two bracelets, the experimenter tells the children to stop. The child who made most bracelets (or sometimes the one who made the prettiest one) is praised for this and his/her name is written on a blackboard next to the word 'most' or 'prettiest'. One of the remaining children is praised for being the eldest or the biggest. Finally the children are shown an incomplete poorly-done bracelet and are told that a younger child had made that one and that though he tried very hard, this was all he could do. In this way several possible reward criteria were suggested to the children. After the three children have been told all this, they leave the room and are brought back one at a time by an assistant. Each child is shown ten stickers (Damon used ten candy bars) and is told that these are their rewards for helping make the bracelets. Each child must decide how these rewards should be distributed between themselves and the younger child and is asked for its reason. Later, the three children are brought back as a group and are asked to determine together how the stickers should be divided between the four of them.

Scoring

A typed transcript of each *S*'s interview and of the real-life situation was prepared. All protocols were scored blindly without any information about *S*'s age or grade by the authors, according to the instructions in the manual of Gerson and Damon (1975a). The hypothetical stages were derived from the interview arguments and the real-life stages were derived from the real-life arguments. The real-life divisions were also derived from the real-life task. At three points during this task the children were asked to propose reward divisions: (a) immediately after the making of the bracelets (individually); (b) at the start of the group session (publicly); and (c) at the end of the group session.

The reward-divisions are classified according to the following rules: divisions that are such that all four group members get the same number of stickers (2-2-2-2) are called *equal*. Divisions in which the hypothetical poor child gets more than the other three children are called *altruistic* (2-2-2-4). Divisions in which the three participating children give themselves three stickers and the poor child only one are called *partly equal* (3-3-3-1). When the most productive (or best performing) child gets more stickers the division is called an *equity* division (e.g.

4-2-2-2). When the child gives himself the most stickers the division is called selfserving (e.g. 2-4-2-2). The remaining divisions are called *unequal* divisions.

Interscorer-reliability

In 81% of the cases the scorers agreed about the stage-score; in the remaining 19% the difference was just one stage. The rank-correlation between the stage-scores of the two scorers was 0.97 ($N = 40$).

Results

(a) Relation between interview stage-scores and reward divisions in the real-life task

Table 2 shows the percentages of *Ss* proposing different reward divisions before the group sessions at the stage levels. The chosen divisions correspond closely to the hypothetical-reasoning-stages: 47% of the self-serving-reasoning (0-A) *Ss* chose self-serving divisions and 71% of the equity-reasoning (1-B) *Ss* chose equity divisions. The compromise (2-A) *Ss* chose both equal and equity divisions. Only the equity reasoning (1-A) *Ss* chose less equality (32%) than might have been expected.

(b) The relation between hypothetical and real-life stage-scores

The (Spearman)-correlation of the hypothetical stage-scores with the

Table 2

Percentages of subjects proposing different rewards divisions at the hypothetical stage levels before the group session began.

	Stage				
	0-A	0-B	1-A	1-B	2-A
Equal (2-2-2-2)	—	4	32	7	42
Altruistic (2-2-2-4)	—	—	16	—	17
Partly equal (3-3-3-1)	7	33	—	21	—
Equity (e.g. 4-2-2-2)	27	29	26	71	25
Self-serving (e.g. 2-2-4-2)	47	33	5	—	17
Unequal	19	—	21	—	—

Table 3
Number of s's at different hypothetical and real-life stages.

Hypothetical stage	Real-life stage				
	0-A	0-B	1-A	1-B	2-A
0-A	10	5			
0-B	2	19	2	1	
1-A		5	10	2	2
1-B		2	3	6	3
2-A			1	2	9

stage-scores based on the arguments the *S* used in the real-life setting is 0.84 ($N = 84$, $p < 0.001$). This relation is visualized in table 3 (chi square is 115.5, $p < 0.001$, $df = 16$). The partial correlation between the two stage-scores with age partialled out is 0.44. There are no significant differences in the absolute levels of the two stage scores for the total group nor for the separate age levels (all the t -values were between -1 and $+1$).

(c) *Some other results*

This study compared age trends elicited by different measurement-procedures. Implicitly also two replication studies were performed: the interview study of Damon (1973) and the real-life division study of Damon (1976). Like Damon (1973) we observed a very high correlation between the stage-scores and age (our rank-correlation is 0.87, $p < 0.001$). However, we did not find any *Ss* that used predominantly 2-B arguments. Like Damon (1976) we observed an increase in the number of equal divisions with increasing age. Table 4 shows our results, both individually before the group session, at the start of the group session, and at the end of the group session. At all three choice points the percentages of equal, partly equal and altruistic divisions increase with increasing age, while the percentages of unequal, equity and self-serving divisions decrease with age. Table 3 also shows that the percentages of equal, partly equal and altruistic divisions increase over the choice points, except for the 6–7 year-old children. Here a slight decrease in the percentages of 'equal' divisions shows up from the second to the third choice point.

Discussion

Most of the results of the present study conform to the results of the previous studies, as outlined in the introduction: the youngest children argued and divided in a self-serving way, while the divisions and arguments of somewhat older children were dominated by equality considerations. Moreover, in the hypothetical and the real-life arguments the same age trends appeared as in previous studies, with these two being highly correlated.

However, some of our results differ from the results of previous studies: (a) In our study real-life reward-divisions seem to show more differentiation, both within and over age-groups. (b) In our study a correspondence showed up between trends in hypothetical arguments and real-life divisions. (c) This trend-correspondence was not only present in the youngest age-groups (as in previous studies), but also in the 7 to 11 year-old children. (d) This trend-correspondence was, however, less clear in our youngest subjects than in previous studies, since only 32% of our 1-A subjects (equality) chose for equal divisions. (e) The hypothetical arguments were not of a higher level than the real-life arguments.

Whether the reward divisions in our study really show more differentiation is a little uncertain because there might be hidden differentiations in the reward divisions in previous studies. While previous investigators only distinguished equal and unequal divisions in their reports, we cannot conclude that they did not find equity or altruistic divisions. These may be included in the unequal divisions. The following discussion assumes that previous investigators did not find equity and altruistic divisions.

The greater differentiation of our real-life reward-divisions may be attributed to a difference in the to be divided rewards: in previous studies an equal division was easy to attain (*e.g.* 8 candies might easily be divided in 4 equal parts of 2 candies each). Though in the real-life division task of Damon (1976) 10 candybars were to be divided between 4 children, this did not get his subjects into trouble: they halved two of the candybars and gave each child 2 and a half candybars. Though our real-life division task is an exact replication of Damon's, one seemingly small difference was made: to please parents who oppose candy, we replaced the candybars by attractive stickers (10 pieces). We did not realise, however, that 10 stickers could not be so easily divided in 4 equal

parts, because torn stickers are worthless. The only way to reach equal solutions in our study was to return two stickers to the experimenter. In this way equal solutions were made less obvious and a greater differentiation in rewards resulted.

Afterwards, we were glad to have replaced the candybars by stickers, because this led to a serendipitous discovery: by making equal solutions less obvious, not only a greater differentiation in reward-divisions was observed, but also a correspondence between arguments and divisions (or between cognition and behavior).

Whereas on the basis of previous studies it should be concluded that there is a lack of correspondence between argument trends and division trends in 7 to 11 year-old children, on the basis of our study this conclusion can be replaced by the following: correspondence between argument trends and division trends may only be expected when neither equality nor equity responses are too obvious. Just as the above mentioned instructions led to equity responses (or intermediate responses) in children of all investigated age levels, too easy equally divided rewards led to equality divisions in most of the 7 to 11 year-old children. In this age group differences between cognitive stages seem only to become manifest in behavior (*e.g.* reward-divisions) when equal divisions are hampered (and the instructions do not emphasize equity divisions as in many equity studies discussed in the introduction).

On the basis of previous studies we concluded in the introduction that a correspondence exists between argument trends and division trends in young children (4 to 7 year-olds). In our study this correspondence was, however, less clear than in previous studies. This difference between our results and those of other studies, should, in our view, also be attributed to the fact that the stickers could only with some trouble be divided in four equal parts: some younger children (especially stage 1-A) probably have a strong preference for equal divisions, but are at the same time less able to reach equal solutions when these are difficult to reach.

The absence of an absolute difference between hypothetical and real-life arguments contradicts the result of Gerson and Damon (1975b). Since their sample was rather small (24), we tend to attribute their result to chance.

Three main conclusions seem to follow from the theoretical and empirical analysis: (a) Division behavior is very sensitive to social-desirability-effects and one should be very careful in designing instructions and

experimental arrangements. (b) When the appropriate measures are taken, hypothetical arguments, real-life arguments and real-life divisions can elicit the same age trends. (c) In normal cases, however, many children tend to prefer equal divisions of rewards especially in group situations, while at the same time in their arguments other considerations such as equity may dominate.

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