Br. J. soc. clin. Psychol. (1975), **14**, pp. 341–349
Printed in Great Britain

Altruism and Cognitive Development in Children

BY J. PHILIPPE RUSHTON* AND JANET WIENER
Department of Social Psychology,
London School of Economics and Political Science

The study examined the interrelationships between a number of age-related cognitive tasks and three different behavioural measures of altruism in 60 7- and 11-year-olds. The cognitive tasks included measures of role-taking ability, egocentricity, cognitive complexity, and conservation. It was intended to assess (*a*) the notion of generalized cognitive developmental levels, (*b*) the generality of altruistic behaviour, and (*c*) the degree to which cognitive-developmental level predicted altruistic behaviour. As expected, highly significant age differences were found on all cognitive tasks. Eleven-year-olds were also significantly more altruistic than were seven-year-olds. Although some generality emerged across altruistic behaviours, no such generalities emerged either between the cognitive measures themselves or between the cognitive measures and altruism. Some of the implications of the findings are discussed.

Children's generosity appears to increase reliably with age, at least over the period of middle childhood (i.e. 6–12) (Elliott & Vasta, 1970; Emler & Rushton, 1974; Handlon & Gross, 1959; Midlarsky & Bryan, 1967; Ugurel-Semin, 1952). This age period is also a time of change in such cognitive-developmental processes as moral judgement (Piaget, 1932) and role-taking (Flavell, 1968), both of which have been hypothesized to underlie the age changes in generosity (Bryan & London, 1970; Rosenhan, 1969, 1972; Wright, 1971). Some recent research has suggested that this might indeed be the case. Thus Emler & Rushton (1974) found a relationship between the child's maturity of moral judgement and the amount of sharing behaviour evidenced. Some support for a replication of this finding was demonstrated in a subsequent study (Rushton, 1975). Rubin & Schneider (1973) also found a relationship between moral judgement and measures of 'helping behaviour' in young children. These latter authors also found a relationship between a child's altruism and a measure of 'decentration' – a measure conceptually similar to 'role-taking ability'. Thus the idea of changes in cognitive development underlying the age relationship with generosity has received support. On the other hand, Emler & Rushton (1974) failed to find relationships between two different measures of role-taking ability and generosity. One of the purposes of the present research was to explore further the role of cognitive-developmental variables in accounting for the generosity of children.

The underlying rationale for the investigations cited was based on the view that the different cognitive levels of development that a child passes through should be predictors of the child's behaviour on relevant tasks. Or, in the words of Kohlberg (1969), 'A given stage-response on a task...represents an underlying thought organization...which determines responses to tasks which are not

* Now at the Department of Psychology, York University, Toronto, Ontario M3J 1P3, Canada.

manifestly similar' (pp. 352–353). Such a viewpoint often finds expression in the literature on cognitive development. For example, '...a child of eight who possesses the grouping structure will, by implication from the structure, show reversibility of thought, a relative lack of egocentrism, a capacity for synthesizing rather than simply juxtaposing data, and a number of other characteristics (Flavell, 1963, p. 18) and 'The transitions with which we shall be concerned, are interesting in their own right as a documentary on development. More interesting still is the picture of the underlying form of organization in thought that is revealed' (Olver & Hornsby, 1966, p. 69).

Thus the overall assumption is that children who differ in their underlying cognitive structure (level) should show systematic, corresponding differences in their intellectual and social behaviours. It still remains to be determined, however, whether there are such *generalized* levels in cognitive development. Most studies tend to explore one area of development at a time and little attempt is made *empirically* to demonstrate the degree of interrelationships between areas of cognitive functioning. The present study was designed to do just this using a battery of established cognitive tasks.

A further area of concern involves the present controversy as to whether social behaviours show generality across situations, or are situation specific (Mischel, 1968, 1973). A cognitive-developmental approach to altruistic behaviour assumes that there are reasonable generalities across situations. If this were not the case there would be little reason to look for such generalized cognitive-developmental precursors of generosity as role-taking ability and moral judgement. The present study used three behavioural measures of altruism in order to investigate this question further.

Thus the study reported here aimed (*a*) to explore further the role of cognitive developmental variables in accounting for the generosity of children; (*b*) to test the notion of 'generalized levels' in cognitive development; and (*c*) to examine generalities across altruistic behaviours.

METHOD

Subjects

Thirty 7-year-olds and thirty 11-year-olds, divided evenly between the sexes, participated in the study. They were drawn, with equal numbers, from five predominantly lower middle-class primary schools in Hertfordshire. The National Foundation for Educational Research (NFER) Intelligence Test No. 3, both verbal and non-verbal forms, was administered, and showed the sample to be of average ability (verbal IQ: mean 7 = 99·9, S.D. = 11·8; mean 11 = 106·6, S.D. = 14·6; non-verbal IQ: mean 7 = 104·3, S.D. = 15·7; mean 11 = 109·6, S.D. = 13·5).

Procedure

A battery of ten measures – seven 'cognitive' and three 'behavioural' – was taken from the children, all of whom were tested individually. The study was conducted in two classrooms made available in each school, one for the cognitive measures and the other for the behavioural. Three experimenters were used: a male and a female graduate student, and a male undergraduate. The subject was sent to the experimental room by the teacher and was met by the female experimenter, who established rapport. She told the child, 'We are designing some games for children and would like your help.' The cognitive tasks were

administered first, their order being randomized. This took about 40 min., following which the subject was given 'a chance to win a prize for being so good'. The subject went with the experimenter to the other room where he went through the behavioural tasks. These followed the same order each time and took 15 min.

Instruments

A. Cognitive tasks.

(1) *Role-taking task: Board game (from Flavell, 1968, pp. 82–102).* The subject was shown non-verbally how to play a snake-and-ladders type of game. His task was then to explain in his own words the rules of the game first to the second experimenter sitting opposite him ordinarily and then to the second experimenter sitting opposite him blindfolded. He was told to modify his explanation on the second occasion to take account of the fact that the experimenter could no longer see the board and counters. The degree to which the subject was able to do this was employed as his score of role-taking ability. Scores, which ranged from 0 to 20, were based on the difference between the amount of worthwhile information given on the first occasion from that given on the second.

(2) *Role-taking task: Cylinders (from Flavell, 1968, pp. 55–70).* This task was designed to assess 'perceptual' role-taking skill. It measured the subject's ability to predict the appearance of a stimulus display from a perspective other than his own. Subjects were shown a series of four stimulus displays and were asked to reconstruct each one as it would look to the second experimenter seated at different vantage points *vis-à-vis* the display. Scores could range from 0 to 36.

(3) *Conservation task (from Bruner et al., 1966).* A standard liquid conservation task was given to the subject to discover if he could conserve liquid and, if so, to examine the reasons he gave. Four such tasks were given. Since all children could conserve scoring was based on the reasons given using Bruner's (1966, p. 235) developmentally ordered justifications for conservation: perceptual, direct-action, and transformational. These are ordered according to the degree to which they reflect immediate phenomenal or perceptual features of the situation. Scores could range from 4 to 12.

(4) *Person perception photo-grouping task (adapted from Olver & Hornsby, 1966).* The subject was presented with a display of 15 colour photographs of different people to sort. The grouping strategies adopted were scored according to Olver & Hornsby's (1966) adaptation of Bruner's (1966) developmental scheme. This was based on the degree to which they reflect the immediate perceptual features of the stimuli: (i) *perceptual*, in which items are rendered equivalent on the basis of immediate phenomenal qualities; (ii) *functional*, in which items are rendered equivalent on the basis of the function of items; and (iii) *symbolic*, in which items are rendered equivalent on the basis of non-sensory ideas like relations between quantities.

(5) *Cognitive simplicity–cognitive complexity measure.* On the basis of the person perception photo grouping task just cited, the number of pair groupings were counted. Such a grouping strategy has previously been shown to decline with age (Olver & Hornsby, 1966) and has been said to reflect the degree of the child's 'cognitive complexity'.

(6) *Person perception Kelly-Grid-type-construct task (devised by J. Wiener).* The subject was asked to describe five significant other people in his life by grouping the five in groups of three. For each group, the subject was asked to think of three ways in which any two people in the group were similar, but different from the third. These constructs were coded on the basis of the same three developmental categories used for the photo-sorting task, i.e. perceptual, functional and symbolic. The subject's cognitive-developmental score on this task was based on the number of constructs falling into the symbolic category.

(7) *Egocentricity score.* The constructs generated by the above measure were scored for signs of egocentricity. This was a yes/no categorization based on whether the construct was made with direct reference to the subject. The subject's egocentricity score consisted of the absolute number of egocentric statements out of the 30 possible.

B. Behavioural tasks.

(8) *Competitive racing game (adapted from Rutherford & Mussen, 1968).* In ten races, the child raced a toy car against the experimenter's car along a 3 ft. 'track' on the floor.

This track was marked off in inches. The competition was 'to see who can get to the end of the track first'. The experimenter moved his car at a constant, moderately slow speed, and the child could win or lose the race with a large or small margin of victory. In no instance did the subject permit the experimenter to win. The competitiveness score was the subject's average margin of victory for the ten races, expressed in inches. 'Competitiveness' scores ranged from 2 to 31 in.

(9) *Generosity to a charity* (*Rosenhan & White, 1967*). The subject played on an electronic bowling game from which he won tokens later exchangeable for prizes on the basis of the more tokens won, the better the prize given. At the same time the subject was given an opportunity to donate, anonymously, some of his winnings to 'Bobby', a small boy on a 'Save the Children Fund' poster. The number of tokens donated (out of a possible 16) constituted the generosity score on this measure.

(10) *Generosity to a friend* (*from Rutherford & Mussen, 1968*). The subject exchanged however many tokens he had left for 'a prize', in this case, 24 sweets. He was then given two paper bags. On one was written his name, and on the other the name of his best friend. The subject was told he could put all the sweets in his own bag if he wished, it really didn't matter, but if he wished to give any to his friend he could do so in the bag provided. The experimenter then left the room. As the subject came to leave the room with the two bags of sweets, the experimenter suggested to him that he leave the bags on a nearby shelf until the end of the day. The number of sweets given to the friend, out of the possible 24, constituted the generosity score.

RESULTS

A random sample of 25 per cent of the interviews were scored by a second coder. Inter-coder agreement for the seven cognitive-developmental measures ranged from 87 to 99 per cent.

Means and standard deviations of the various tasks were computed separately for the two age groups. These are presented in Table 1.

Table 1. *Means and standard deviations of cognitive and behavioural tasks*

	7-year-olds		11-year-olds	
	Mean	S.D.	Mean	S.D.
1. Role-taking board game	6·5	2·1	8·2	2·7
2. Role-taking cylinders task	12·9	8·1	25·8	7·2
3. Conservation task	2·8	1·5	6·1	2·7
4. Person perception photo grouping	14·1	20·9	32·7	27·6
5. Cognitive simplicity	9·1	5·5	6·0	4·3
6. Person perception Kelly Grid task	27·1	20·8	40·7	23·7
7. Egocentricity	10·3	10·4	4·9	6·5
8. Competitiveness	13·5	7·2	19·0	6·4
9. Generosity to charity	2·9	2·5	5·8	2·9
10. Generosity to friend	4·5	3·7	10·0	2·4

In order to assess the effects of age, sex, verbal IQ and non-verbal IQ on these tasks, product-moment correlations were computed. Since age was significantly related to verbal IQ ($r = 0{\cdot}25$; $P < 0{\cdot}05$) and marginally related to non-verbal IQ ($r = 0{\cdot}18$; $P < 0{\cdot}10$), age was partialled out of the analysis with IQ. The results are shown in Table 2.

From Table 2 it can be seen that there were highly significant age differences on all tasks, both cognitive and behavioural. On the cognitive tasks this meant that older children were more advanced, and on the behavioural tasks it meant that

older children were both more generous *and* more competitive. Significant IQ differences were found on three of the cognitive tasks with high IQs scoring higher than low IQs. This was true for both verbal and non-verbal IQ which intercorrelated $r = 0{\cdot}73$ ($P < 0{\cdot}001$).

Table 2. *Correlations of age, sex, verbal IQ and non-verbal IQ with cognitive and behavioural measures*

(Age partialled out of analyses with IQ.)

	Age	Sex	Verbal IQ	Non-verbal IQ
1. Role-taking board game	0·34 **	−0·03	0·15	0·20
2. Role-taking cylinder task	0·65 ***	0·02	0·29 **	0·45 ***
3. Conservation task	0·61 ***	−0·10	0·34 **	0·18
4. Person perception photo grouping	0·36 **	−0·12	−0·04	0·00
5. Cognitive simplicity	−0·31 **	0·26 *	−0·08	−0·12
6. Person perception Kelly Grid-type task	0·30 **	−0·07	0·29 **	0·30 **
7. Egocentricity	0·30 **	−0·16	−0·01	0·01
8. Competitiveness	0·36 **	0·07	−0·01	0·10
9. Generosity to charity	0·47 ***	0·01	0·00	0·16
10. Generosity to friend	0·68 ***	0·04	0·11	−0·05

* $P < 0{\cdot}05$. ** $P < 0{\cdot}01$. *** $P < 0{\cdot}001$.

The purpose of the study was to determine the intercorrelations between (*a*) the cognitive tasks, (*b*) the behavioural tasks, and (*c*) the cognitive tasks with the behavioural. For this purpose, a correlation matrix was computed for all the variables. Since Table 2 had indicated highly significant correlations between the tasks and age and IQ, these last two variables were partialled out of the analysis to allow an unconfounded examination of the relationships between the other variables. This correlation matrix is shown in Table 3.

While 23 of the 45 correlations were significant at beyond the $P < 0{\cdot}05$ level when the effects of age and IQ were *not* partialled out, only five remained once the effects of age and verbal IQ had been partialled out. Of these five, two were intercorrelations between cognitive tasks, one was between a cognitive and a behavioural task, and two were between behavioural tasks. Generosity to a friend related positively ($r = 0{\cdot}24$; $P < 0{\cdot}05$) with generosity to a charity, and negatively ($r = -0{\cdot}55$; $P < 0{\cdot}001$) with competitiveness.

To ascertain whether the degree of interrelatedness varied by age, two separate matrices were computed, one for each age. These are shown in Table 4. Five significant correlations were obtained for the younger age group, and eight for the older group. Only two were common to both age groups. The correlations do not reveal any pattern, or any obvious reason why they should exist at one age but not the other. Nor can it be maintained that with increasing age there is an increasing generality found in cognitive functioning.

Table 3. *Correlations between cognitive and behavioural tasks*

(With age and verbal IQ partialled out.)

	1 Board game	2 Cylinders	3 Conser-vation	4 Photo grouping	5 Cognitive simplicity	6 Kelly Grid	7 Egocen-tricity	8 Competi-tiveness	9 Generosity to charity	10 Generosity to friend
1. Role-taking board game	1·00	0·09	0·13	0·15	−0·07	−0·05	−0·10	0·09	0·20	−0·09
2. Role-taking cylinder task		1·00	−0·10	0·06	0·08	0·05	0·15	0·05	0·18	0·05
3. Conservation			1·00	−0·03	−0·28 *	−0·11	0·16	−0·05	0·00	0·01
4. Person perception photo grouping				1·00	0·01	0·24 *	−0·12	0·12	0·14	0·07
5. Cognitive simplicity					1·00	0·08	−0·10	−0·10	0·09	0·08
6. Person perception Kelly Grid						1·00	−0·18	0·26 *	0·06	0·16
7. Egocentricity							1·00	−0·09	−0·02	0·03
8. Competitiveness								1·00	0·04	−0·55 ***
9. Generosity to charity									1·00	0·24 *
10. Generosity to friend										1·00

* $P < 0.05$. *** $P < 0.001$.

Table 4. *Intercorrelations among tasks by age separately and controlling for verbal IQ*

(7-year-olds above diagonal; 11-year-olds below diagonal.)

	1 Board game	2 Cylinders	3 Conser-vation	4 Photo-grouping	5 Cognitive simplicity	6 Kelly Grid	7 Egocen-tricity	8 Competi-tiveness	9 Generosity to charity	10 Generosity to friend
1. Role-taking board game	—	0·09	0·17	0·11	−0·26	−0·19	−0·04	0·34 *	0·26	−0·15
2. Role-taking cylinder task	0·09	—	−0·03	−0·10	−0·23	−0·16	0·23	−0·08	−0·01	0·07
3. Conservation	0·15	−0·13	—	−0·13	−0·31 *	−0·20	0·12	−0·12	0·29	0·11
4. Person perception photo-grouping	0·17	0·19	0·40	—	0·00	0·39 *	−0·15	−0·12	−0·10	−0·05
5. Cognitive simplicity	0·05	0·13	−0·31 *	0·00	—	0·00	−0·01	−0·01	−0·03	−0·04
6. Person perception Kelly Grid	0·08	0·31 *	−0·11	0·17	−0·10	—	−0·41 **	−0·05	−0·09	−0·17
7. Egocentricity	−0·15	0·08	0·19	−0·09	−0·13	0·09	—	−0·24	−0·15	0·17
8. Competitiveness	−0·11	−0·07	−0·07	0·35 *	−0·12	0·45 ***	0·08	—	0·07	−0·63 ***
9. Generosity to charity	0·19	0·40 **	−0·18	0·30	0·32 *	0·17	0·10	−0·02	—	0·19
10. Generosity to friend	−0·09	0·05	0·05	0·20	0·14	−0·10	−0·16	−0·39 *	0·40 **	—

* $P < 0·05$. ** $P < 0·01$. *** $P < 0·001$.

DISCUSSION

This study very strongly supports the large body of previous research demonstrating that the cognitions and behaviour of a 7-year-old are significantly different from those of an 11-year-old. This is exactly what one would expect in adopting a cognitive-developmental approach to study middle childhood. However, one would, in addition, expect to find some degree of correlation between the cognitions and behaviours within each group (Bruner *et al.*, 1966; Flavell, 1963; Kohlberg, 1969). In this study, however, which concentrated on the social domain, virtually no interrelationships between age-related tasks were found. When the effects of age and IQ were partialled out, children who were high scorers on one role-taking task did not necessarily score highly on either of the two person-perception tasks, the conservation task, the behavioural tasks, or even the second role-taking task. The very small number of intercorrelations involving the cognitive tasks were not common for both 7- and 11-year-olds and are best treated as chance occurrences. It would seem that, in the domain of person perception and altruistic behaviour at least, these results call into question the notion of *generalized* cognitive developmental levels mediating behavioural and cognitive repertoires.

It is possible, of course, that the lack of interrelationships is due to the nature of the particular tasks used. It might be argued that, although these tasks are age-related, they are not mediated by any known 'organizational structures' or 'schema' or 'stage' and therefore relationships between them need not be expected. Yet, since organizational structure can only be inferred in the first place from age-related overt behaviour and since we have used demonstrably significant age-correlated tasks, this argument loses some of its cogency. In the absence of further evidence, therefore, we must conclude that the notion of 'generalized levels' in cognitive development is *not* supported by the data.

The lack of relationship between the cognitive and the behavioural measures in this study casts doubt on the hypothesis that some general change in cognitive development mediates the age changes consistently found in altruistic behaviour. Specifically, it replicates the negative findings of Emler & Rushton (1974) with respect to the widely held view that role-taking abilities are necessary prerequisites for generosity (Rosenhan, 1969, 1972; Wright, 1971). Previous research has suggested that moral judgement relates to a child's altruistic behaviour (Emler & Rushton, 1974; Rubin & Schneider, 1973). Further research is required to see whether the moral judgement relationship with altruistic behaviour is a *specific* relationship or whether it is part of a more general cognitive developmental process. The evidence from this study must suggest the former.

The correlations found between the behavioural tasks are of interest. The evidence reported here replicates that of Rutherford & Mussen (1968) who also found relations between behavioural generosity and other 'pro-social' characteristics in children. Present evidence then suggests the possibility that there is *some* generalization of altruistic behaviour. However, the size and patterning of the correlations are not impressive. The negative correlations between competitiveness and generosity to a friend declined sharply from the 7- to the 11-year-old

samples, and there was no significant correlation between competitiveness and generosity to a charity. Furthermore, the correlation of +0·24 (for both ages combined) between generosity to a friend and generosity to a charity indicates of course, only 6 per cent of shared variance. The value of searching further for *generalized* cognitive development antecedents of 'dispositions' of the strength found in this study may therefore be questioned.

The authors would like to thank Tim Oake for his kind help with the collection of data.

REFERENCES

BRUNER, J. S., OLVER, R. R. & GREENFIELD, P. M. (1966). *Studies in Cognitive Growth*. New York: Wiley.

BRYAN, J. H. & LONDON, P. (1970). Altruistic behaviour by children. *Psychol. Bull.* **73**, 200–211.

ELLIOTT, R. & VASTA, R. (1970). The modelling of sharing: effects associated with vicarious reinforcement, symbolization, age and generalization. *J. exp. child Psychol.* **10**, 8–15.

EMLER, N. P. & RUSHTON, J. P. (1974). Cognitive-developmental factors in children's generosity. *Br. J. soc. clin. Psychol.* **13**, 277–281.

FLAVELL, J. H. (1963). *The Developmental Psychology of Jean Piaget*. Princeton, N.J.: Van Nostrand.

FLAVELL, J. H. (1968). *The Development of Role-Taking and Communication Skills in Children*. New York: Wiley.

HANDLON, B. J. & GROSS, P. (1959). The development of sharing behaviour. *J. abnorm. soc. Psychol.* **59**, 425–428.

KOHLBERG, L. (1969). Stage and sequence: the cognitive developmental approach to socialization. In D. A. Goslin (ed.), *Handbook of Socialization Theory and Research*. Chicago: Rand McNally.

MIDLARSKY, E. & BRYAN, J. H. (1967). Training charity in children. *J. Person. soc. Psychol.* **5**, 408–415.

MISCHEL, W. (1968). *Personality and Assessment*. New York: Wiley.

MISCHEL, W. (1973). Toward a cognitive social learning reconceptualization of personality. *Psychol. Rev.* **80**, 252–283.

OLVER, R. R. & HORNSBY, J. R. (1966). On equivalence. In J. S. Bruner, R. R. Olver & P. M. Greenfield, *Studies in Cognitive Growth*. New York: Wiley.

PIAGET, J. (1932). *The Moral Judgement of the Child*. London: Routledge & Kegan Paul.

ROSENHAN, D. L. (1969). Some origins of concern for others. In P. Mussen, J. Langer & M. Covington (eds.), *Trends and Issues in Developmental Psychology*, New York: Holt, Rinehart & Winston.

ROSENHAN, D. L. (1972). Learning theory and prosocial behaviour. *J. soc. Issues* **28**, 151–163.

ROSENHAN, D. L. & WHITE, G. M. (1967). Observations and rehearsal as determinants of prosocial behaviour. *J. Person. soc. Psychol.* **5**, 424–431.

RUBIN, K. H. & SCHNEIDER, F. W. (1973). The relationships between moral judgement, egocentrism, and altruistic behaviour. *Child Dev.* **44**, 661–666.

RUSHTON, J. P. (1975). Generosity in children: immediate and long-term effects of modelling, preaching and moral judgement. *J. Person. soc. Psychol.* **31**, 459–466.

RUTHERFORD, E. & MUSSEN, P. (1968). Generosity in nursery school boys. *Child Dev.* **39**, 755–765.

UGUREL-SEMIN, R. (1952). Moral behaviour and moral judgement of children. *J. abnorm. soc. Psychol.* **47**, 463–474.

WRIGHT, D. (1971). *The Psychology of Moral Behaviour*. Harmondsworth: Penguin Books.

Manuscript received 30 *November* 1973

Revised manuscript received 15 *January* 1974