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Moral and cognitive reasoning features in congenitally blind children: Comparisons with the sighted

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Moral and cognitive reasoning (within the Piagetian theory) aspects of congenitally blind children ranging in age from 6 to 12 years were examined and compared with those of a sighted sample, matched in age and socio-economic background. The results of the study show that moral and cognitive development in the congenitally blind proceeds at a slower rate, but the developmental lag in the moral domain does not apply to all moral reasoning features examined. The dimension of retributive vs. distributive justice, for example, seems to develop in the same manner in the two samples. Regarding the prerequisite relationships between cognitive and moral development, the reciprocal interaction prediction was the more powerful for the sighted children, whereas for their blind counterparts, cognitive capacity seemed to exert greater influence on moral development. Possible explanations of the findings are discussed.

Piaget's cognitive-developmental approach to morality provided a useful framework for the study of children's moral reasoning. According to Piaget (1968a/1932) the development of moral reasoning is a stepwise, invariant process during which the more primitive heteronomous moral thought is eventually transformed into the more mature 'stage' of autonomous moral thinking. Heteronomous morality or *moral realism* is characterized by the child's unilateral respect for adults and his/her concomitant inability to consider intentions in evaluating a moral transgression. In Piaget's own words, moral realism is 'the tendency to regard duty and the value attaching to it as self-subsistent and independent of the mind, as imposing itself regardless of the circumstances in which the individual may find himself' (p. 106). Thus children up to about age 7 base their judgements on what Piaget calls 'objective responsibility', i.e. the material result of a certain act. When *autonomous* moral reasoning is consolidated, the intentions of the actor enter into the child's evaluation.

Regarding the development of the idea of justice, Piaget makes the distinction between *retributive* and *distributive* justice. The first is the more primitive of the two, 'if by primitive is meant, not so much what is early in point of time, but what is most overlaid with elements that will be eliminated in the course of mental development' (p. 137). A salient feature, for example, of the younger child's understanding of justice is that he or she selects, from a number of alternative kinds of punishments for

an act of disobedience, the one that is unrelated to the transgression, but that hurts most. Piaget's explanation is that this is due to the child's desire to restore the disturbed communion with the adults to whom he/she tends to be submissive, since retributive justice is tied to breaking rules and obedience to adult authority.

Between the ages of 9 and 12 the attitude towards retributive justice diminishes and the child favours punishments that are related to the offence, i.e. punishment by reciprocity. If given several alternatives from which to select he/she usually prefers those that result in something comparable to what he/she has done.

The qualitative transformations of children's moral reasoning (i.e. the transition from heteronomous to autonomous morality) do not constitute any 'stage sequence' similar to that which characterizes the development of cognitive structures, since, as Piaget's data indicated, there is a temporal overlap between the two kinds of moral thought. Piaget contented himself with referring to 'phases' of transition and age trends. Such a transition, invariably from the former to the latter, is a slow process, determined mainly by two factors. It is determined first by the appearance of concrete operational thinking in a wide gamut of problems, moral problems included. Hence, Piaget maintains that 'honesty, a sense of justice, and reciprocity together form a rational system of personal values. Without exaggeration, this system can be compared to the "groupings" of relations or concepts that characterize logic' (1968*b* p. 58). Piaget himself never tested the supposed parallelism between moral and cognitive development, but subsequent research has generally confirmed his position, although disagreements concerning the mechanisms of such a parallelism still exist (Cauble, 1976; Faust & Arbuthnot, 1978; Kuhn, Langer, Kohlberg & Haan, 1977; Lee, 1971; Stuart, 1967; Walker, 1980, 1986; Walker & Richards, 1979).

The second factor responsible for moral growth is the enrichment of the opportunities for interaction among peers, which gradually replaces the egocentric perspective of the child, as a result of which the child understands that reciprocity in moral behaviour is a necessary condition for the stability of social functioning. The increased social interaction stimulates cognitive disequilibrium which facilitates progression through the phases of moral development (cf. Turiel, 1974). This is especially true with regard to the development of the justice concept, which seems to be a direct result of cooperation. In Piaget's own words 'the sense of justice, though naturally capable of being reinforced by the precepts and example of the adult, is largely independent of these influences and requires nothing more for its development than the mutual respect and solidarity which holds among children themselves' (1968*a*, p. 195).

Research data bearing on the peer interaction hypothesis are contradictory (cf. Lickona, 1976, pp. 231ff), but more recent evidence concerning social perspective taking and moral reasoning has shown that the ability to consider the other's point of view (which obviously stems from social participation) in a given moral conflict, is positively related to moral development (Selman, 1980; Walker, 1980).

To the best of the present author's knowledge, references in the literature deal with various dimensions of moral development in children without any sensory impairment, an exception to this being Nass' study (1964) with deaf children and Stephens & Simpkins' (1974) project on the reasoning, moral judgement and moral conduct of congenitally blind children. According to Stephens & Simpkins, the

sighted children made more mature moral judgements, whereas the blind showed greater capacity in generalizing moral judgements. The results also indicated that the differences between the blind and the sighted on the moral reasoning measures were relatively small compared to the differences found between the two groups on the operational reasoning tasks, classification and class inclusion in particular. As stated by the authors '... although improvement in concrete reasoning did proceed in most instances, logical thought represented an area of continuing inability' (p. 56).

The focus of the present study was to examine the pattern of moral reasoning in congenitally blind children. Since the rate of moral progression varies, depending mainly on the quality and quantity of the opportunities for peer cooperation and reciprocal role taking, it was hypothesized that the specific handicap of the blind subjects, with the obvious restrictions it imposes on their social interaction, would result in a slower rate of development of moral reasoning, compared to that of a sighted control group matched in age and SES. It was also hypothesized that advanced levels of concrete operational thinking (i.e. where the ability to conceive and perceive a given problem is present), would be positively related to moral growth in both groups.

Finally, a third hypothesis was formulated bearing on the supposed 'developmental lag' characterizing cognitive development in the blind. As Piaget argues 'blind infants have the great disadvantage of not being able to make the same coordinations in space that normal children are capable of during the first year or two, so that the development of sensory-motor intelligence and the coordination of actions at this level are seriously impeded in blind children ... The delay is made up ultimately, of course, but it is significant and much more considerable than the delay in the development of *logic* in deaf and dumb children' (cited by Gottesman, 1976, p. 18). Research evidence related to the cognitive development of the blind, either confirms the Piagetian prediction (Hatwell, 1966, cited in Reid, 1978, p. 215; Miller, 1969; Stephens & Grube, 1982), or supports a parallel development of the concrete operational structures in blind and sighted children (Cromer, 1973; Tobin, 1972). In the present study it was hypothesized that the 'developmental lag', if any, in the cognitive development of the blind, would be similar to that of an analogous lag in their moral development.

Method

Subjects

A total of 120 children participated in the study. Sixty of them were congenitally blind or had lost their vision shortly after birth. The remaining 60 subjects were sighted and served as the control sample. The two samples were divided into three age groups, with 20 subjects in each, as follows: blind, 6-8-year-olds ($\bar{X}=7.36$), 8-10-year-olds ($\bar{X}=8.18$), and 10-12-year-olds ($\bar{X}=11.42$). Sighted, 6-8-year-olds ($\bar{X}=7.12$), 8-10-year-olds ($\bar{X}=9.44$), and 10-12-year-olds ($\bar{X}=11.30$). All subjects were elementary school students (grades 1 to 6). They were selected from schools for the blind in Thessaloniki and Athens, and from a local school for sighted children in Thessaloniki. They came from mixed socio-economic backgrounds (working and lower middle class).

Instruments

Moral reasoning interview (MRI). The MRI consisted of nine items dealing with four areas. Area I clumsiness, II stealing, III lying and IV the dimension of retributive and distributive justice. The nine items were clustered as follows: Area I (2 items), II (1 item), III (3 items) and IV (3 items). The items in area I and IV were adapted from Piaget (1968a), while the items in area II and III were adapted from Hardeman (1972). Caution was also exercised in making the intentions of the protagonists clear. As noted by Liebert (1979, pp. 238ff), the original Piagetian method is plagued with artifacts that weaken the interpretation of his data. Berg-Cross (1975), for instance, has noticed that the stories used actually leave (though not invariably) the child to infer the protagonist's intentions, whereas the consequences are stated explicitly. Another artifact relates to the obvious demand characteristics of the question 'Which boy/girl is naughtier?', which in fact introduces the notion of moral transgression by either or both the protagonists. For this reason the interview (before proceeding to items 1 and 2) started with the question 'What do you think of these two boys/girls; are they naughty? Why?' In order to reduce communication difficulties with the blind, given their inability to understand the conceptual reference of certain words (cf. Elstner, 1983), modifications of the stories were made where necessary. Since the presentation of the items could raise the issue of whether the children retained the relevant information in their memories, subjects were required to demonstrate full memory by free recall and probe questions before making their judgements (cf. Gruenrich, 1982). Every subject was listening to a recorded voice narrating each story (item) in turn. Children were encouraged to interrupt the narration whenever they had anything to ask about the wording or the facts. Children were also encouraged to give as many reasons as possible in justifying their answers. All interviews were tape-recorded and then transcribed. Examples of the items used are given below.

Area I. Intentions varied, consequences varied. Items 1 and 2. The well-known story pair with the broken cups (Piaget, 1968a, p. 118). In the first story a small boy breaks 15 cups by accident; in the second, another small boy breaks one cup in his effort to reach something forbidden by his mother.

Area II. Intentions constant, consequences varied. Item 3. 'Once upon a time there were three robbers. They went into a store. And when the storekeeper wasn't looking, they stole all his money. One robber stole a hundred drachmas. The other robber stole ten thousand drachmas. Which robber is worse, or is one just as bad as the other? Why?'

Area III. Intentions vs. size and social distance. As noted by Hardeman (1972), the items in this moral area were designed to 'find out whether the child manifested the ability to maintain values in spite of perceptual distractions introduced by the size of the persons involved or by their social distance' (p. 52). Item 4. 'Is it worse for a child to lie to a grown-up, or to another child, or is the one just as bad as the other? Why?' Item 5. 'Is it worse for a child to lie to his parents, his teacher, or to a grown-up he doesn't know, or is one just as bad as the others? Why?' Item 6. 'Would it be worse for a child to lie to his friend, or to a child he doesn't know, or is one just as bad as the other? Why?'

Area IV. Retributive vs. distributive justice*. Item 7. (Piaget, 1968a, p. 201). 'One afternoon a little boy was playing in his room. His father had only asked him not to play ball for fear of breaking the windows. His father had hardly gone when the boy got his ball out of the cupboard and began to play with it. And bang goes the ball against a window pane and smashes it! When the father comes home and sees what has happened he thinks of three punishments: 1) To leave the window unattended for several days and then, (as it is winter), the boy will not be able to play in his room. 2) To make the boy pay for having broken the window. 3) Not to let him have his toys for a whole week'. Items 8 and 9 consisted of similar stories.

Assessment of cognitive level. The level of operational reasoning of the subjects was assessed by the administration of three cognitive tasks: conservation of substance, classification and class inclusion. For the first task five plasticine balls were used, three of which were of different weights. For the classification task the material used was also familiar to the blind children: fruits (oranges, apples, tangerines), toy furniture (sofa, chair, table) and kitchen utensils (knife, spoon, fork). The material in the

* The items included in the four areas presented kinds of children's everyday behaviour; the dimension of justice, in particular, was included for the purpose of examining whether the restricted pattern of cooperation and conflict among blind children, rendered difficult the acquisition of the reciprocity concept.

class inclusion task consisted of apples and oranges, tables and chairs, spoons and forks, each pair with a ratio of 8:2.

The main consideration that lies behind the selection of the logical and moral reasoning tasks was related to a hypothesized logical-moral correspondence. As Colby (unpublished manuscript) suggests, with regard to Kohlberg's theory, the pre-operational child confuses the psychological with the physical aspects of his world and from this confusion derive the main features of stage 1 or heteronomous (in Piaget's scheme) moral reasoning: the orientation to physical punishment, the conception of authority as derivative from physical power, the evaluation of acts in terms of their physical consequences. In contrast, stage 2 moral reasoning involves the separation of the act itself from the reasons or intentions behind it, 'just as at the concrete-operational level the child separates appearance and reality in conservation' (p. 37). Correspondences can also be hypothesized with regard to seriation, classification or class inclusion. The correct justification of the child's responses to these tasks implies the understanding that an element B can be both bigger than A and smaller than C, 'just as stage 2 moral judgement involves the understanding that the same act can be right in one situation and wrong in another' (p. 38). The procedure of assessing the subjects' cognitive level was the following.

Conservation of substance (sighted children). The experimenter asked each subject to select two balls of plasticine identical in colour and weight; when the selection had been made, the remaining three balls were removed and the experimenter proceeded with the question 'Does the ball I am holding in my hand have the same amount of plasticine as the one you are holding in yours?' If the child expressed any doubts he/she was encouraged to make the two balls alike. The capacity to conserve was then tested by five questions dealing with 1. his/her anticipation of the relative weights of the two balls, in the case of one being transformed into a pancake ('If I press the ball I am holding in my hand and make it look like a pancake, would my pancake have the same, more, or less plasticine than the ball you are holding in your hand?'); 2. the child's judgement after the transformation ('Now, does my pancake have the same, more or less plasticine than your ball?'); 3. the justification of his judgement ('Why do you say that?'). If the subject made a correct judgement to questions 1 and 2 and offered a satisfactory explanation to question 3, the procedure continued with question 4 to find out whether the capacity for reversible operations was present ('What would happen if I transformed (made) the pancake back into a ball? Would it have the same, more or less plasticine?'). If the answer to question 4 was correct, the testing ended with a counter-suggestion 5. ('A friend of yours told me a few minutes ago that there is more plasticine in the pancake, because it is bigger than the ball; what would you tell him to make him believe that your answer is the right one?')

In the case of a subject failing in the three first questions, the procedure was repeated, but this time the transformations were made in terms of the ball he was holding in his hand; if he failed again the procedure ended, whereas if the responses to question 1, 2 and 3 were correct, questions 4 and 5 followed, modified accordingly.

Classification. Each subject was allowed to touch the material, name it twice, and then asked to answer and justify his or her answer to the question: 'Which of the things you just named can go together? ... Why did you put them together?' With the material used, there were four possible classifications.

Class inclusion. The experimenter presented the objects successively, asking the child to name them and find out the different number of objects in each subclass; he then went on to ask a standard question for every concept: 'Are there more apples or more pieces of fruit (tables or furniture, spoons or utensils)? ... Why?'

The procedure with the blind subjects was modified for the purpose of overcoming certain difficulties associated with their sensory impairment. Blind children were encouraged to manipulate the material, name it several times and make the transformations (in the conservation task) by themselves. The questions in the three cognitive tasks were identical to those used with the sighted group.

Scoring

MRI. Responses to the nine moral reasoning items were first categorized in terms of their correspondence to each of the following three qualitative criteria: (a) If the subjects were able to consider intentions in evaluating a transgression; (items 1, 2, 3); (b) if the subjects showed awareness that moral

obligations are a necessary condition for mutual trust among people (items 4, 5, 6); (c) if the subjects favoured the kind(s) of punishment that were related to the disobedient behaviour (items 7, 8, 9). For computational purposes, any response that met the above criteria was assigned a score of '1', the maximum number of autonomous responses thus being nine. If a subject succeeded in 3/4 of the items, or more (i.e. gave six to nine autonomous responses), his/her reasoning was categorized as autonomous (A). Where the response pattern was inconsistent (one to five autonomous responses), he/she was assigned to the transitional phase (T), while a '0' score corresponded to heteronomous moral reasoning (H)*.

Cognitive performance. The analysis of discrimination levels proposed by Shayer & Adey (cf. 1981) was separately applied to the performance of the two samples. Each of the 12 items involved in the three cognitive tasks was assigned to levels 'O' (pre-operational), 'A' (early concrete), 'B' (middle concrete) and 'C' (late concrete), conceived of as levels on a developmental scale. In a second step of the discrimination process the performance of each subject was traced on the whole set of the items and the subject was placed at the highest level in which he/she succeeded in two-thirds of the corresponding items. Finally, the percentage of subjects succeeding in each item was calculated. The discrimination analysis requires that if a deviation is observed between the initial assignment of items to levels and the final discrimination arrived at, the whole procedure should be repeated until the hypothesized item levels and the subjects' level become mutually consistent. In the present study the success criterion per level was as follows: level 'A', correct answers to questions 1 and 2 (conservation task); level 'B', correct answers to questions 3 (conservation), 6 and 7 (classification) and 10 (class inclusion); level 'C', correct answers to questions 4 and 5 (conservation), 8 and 9 (classification) and 11 and 12 (class inclusion). For computational purposes, the levels 'O', 'A', 'B' and 'C' corresponded to 0, 1, 2 and 3 respectively.

Results

The results, illustrated in Fig. 1, provide a relatively clear picture of the main reasoning developmental trends in the two samples. Compared to that of the sighted the developmental pattern of blind children is considerably retarded. As children in both samples grow older, heteronomous moral reasoning is gradually replaced by more mature responses. Worth mentioning here is the identical percentage (low in itself) of autonomous responses attained by the 8-10-year-old sighted children and 10-12-year-old blind children. Additionally, none of the subjects in the two 6-8-year-old age groups displayed autonomous reasoning as defined here (i.e. a score at 6-9). An interesting finding which doesn't appear in Fig. 1 is that most of the mature responses of the blind in the three age groups were given on criterion *c*. Thus 29 out of 35 morally mature responses (82.88 per cent) included in the percentages in transitional and autonomous categories, favoured distributive justice; the corresponding number of sighted children was 36 out of 51 (70.58 per cent).

A similar developmental pattern was found with regard to the capacity of the two samples to reason in terms of concrete operational thinking. The performances of blind children on the three cognitive tasks is, given the qualitative aspects of the discrimination levels, lower. It must be noted that the combined percentage attained by sighted children, 8-10-years-old, on levels B and C, is the same as the corresponding percentage in the 10-12-year-old blind children.

From the various research paradigms that have been used to ascertain prerequisite

* The system of classifying the MRI responses into three levels was designed to correspond, at least roughly, to the three discrimination levels applied on the logical reasoning performances. In cases such as this, a certain degree of arbitrariness seems to be unavoidable.

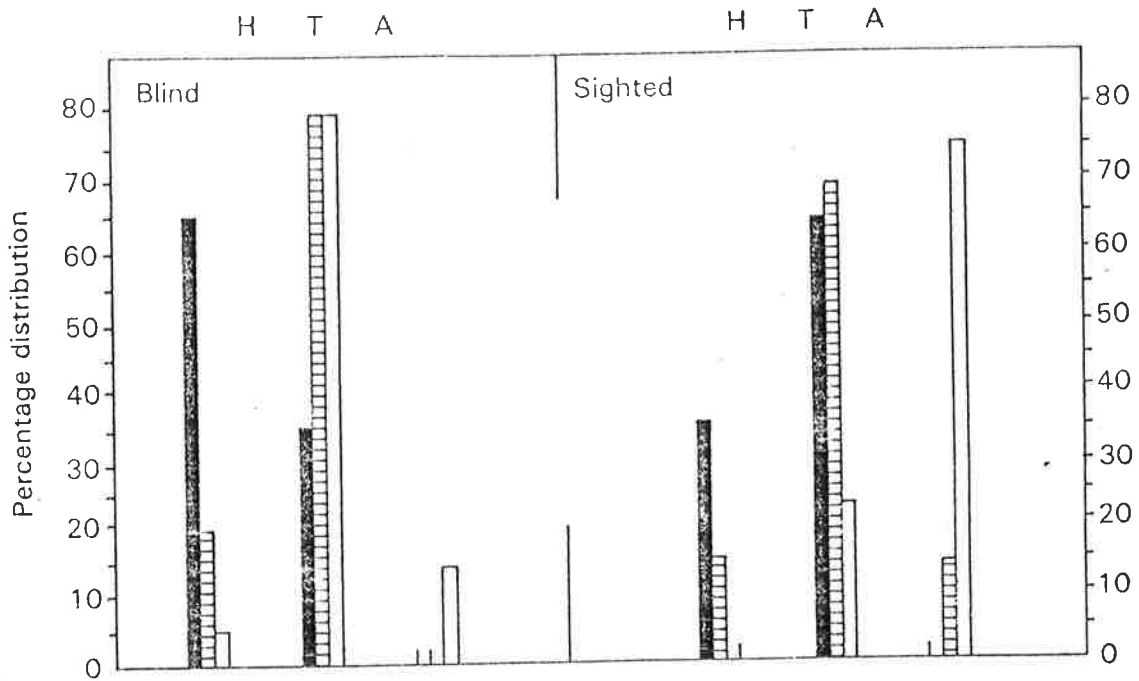


Figure 1. Graphic presentation of the percentage distribution of blind and sighted subjects in the three moral reasoning categories (heteronomous, transitional, autonomous). ■, 6-8-year-olds; ▨, 8-10-year-olds; □, 10-12-year-olds.

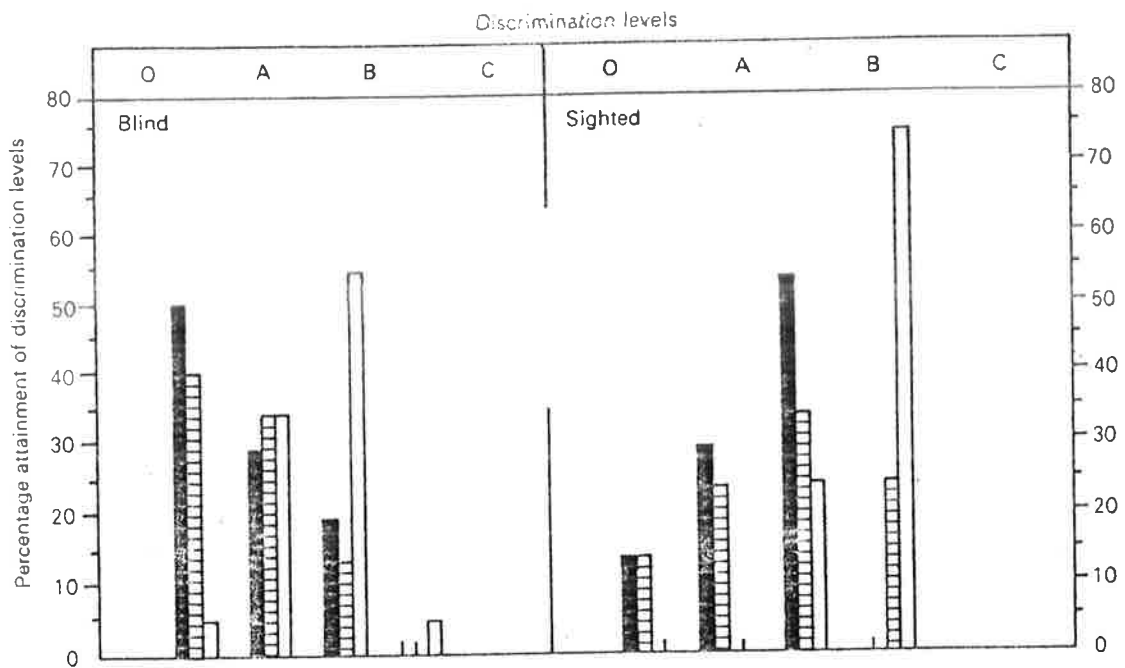


Figure 2. Graphic presentation of the percentage attainment, across age and physical condition, of discrimination levels. O, Pre-operational; A, Early concrete; B, Middle concrete; C, Late concrete; ■, 6-8-year-olds; ▨, 8-10-year-olds; □, 10-12-year-olds.

relationships between cognitive and moral development, the contemporaneous contingent association paradigm was chosen; the crucial test therefore, with regard to the present study, was to find no subjects in certain cells of a 4×3 contingency table. For this purpose, the following three predictions were formulated and tested, separately for the two samples, by the prediction analysis of developmental priority proposed by Froman & Hubert (1980).

Prediction 1. Cognitive development proceeds (or is necessary) for moral development.

Prediction 2. The reverse is true.

Prediction 3. Development in the two domains proceeds through reciprocal interaction.

Table 1 depicts the bivariate frequency distribution between developmental levels and moral reasoning categories. The most powerful predictions, expressed in terms of their success values, were predictions 3 and 1 for the sighted and blind samples respectively.

Table 1. Bivariate frequency distribution between developmental levels and moral reasoning categories [prediction 3 (sighted $\hat{V} = 0.670$, $\chi = 2.11$, $P < 0.001$; prediction 1 (blind) $\hat{V} = 1.00$, $\chi = 1.47$]

Developmental levels	Sighted			Blind		
	Moral H ^b	reasoning T	categories A	Moral H	reasoning T	categories A
0 ^a	6	20	0 ×	14	9	0 ×
A	3	7	1 ×	3	14	0 ×
B	1 ×	5	4	1 ×	15	2
C	0 ×	0 ×	13	0 ×	1 ×	1

^a0. Pre-operational. A. Early concrete. B. Middle concrete. C. Late concrete

^bHeteronomous. Transitional. Autonomous.

Note. The × symbol denotes the error cells for which the weight given was always equal to 1.

Discussion

Two developmental patterns

The development of moral reasoning in congenitally blind children proceeds, generally, at a slower rate compared to that of the sighted. Blindness poses fundamental limitations upon the learning of social roles and the capacity of perspective taking, factors that according to Piaget (1968a) and Selman (1980) are crucial for the onset and consolidation of autonomous moral reasoning. The blind child misses, as a consequence of his/her handicap, the fundamental experience of putting himself/herself into the position of another person and, to a large extent, he/she is also deprived of the opportunities of role taking, a prerequisite of which is social participation. This finding is congruent with Kohlberg's (1969, 1976) and

Piaget's (1968a) suggestion that the quality of social participation, i.e. the degree of individual involvement in the power structure of a peer group, enhances perspective-taking opportunities which, in turn, facilitate moral development. A probably faster developmental pattern would emerge, both with regard to the moral and cognitive domain, should blind children from more favourable social backgrounds be examined. (cf. Brekke, Williams & Tait, 1974; Swallow, 1976). Recent evidence, for example, within Kohlberg's model of moral development (cf. Colby, Kohlberg, Gibbs & Lieberman, 1983), indicates that whereas peer group participation may be especially important for the onset of stage 3, social class seems to be related (with IQ controlled) to the development of stages 4 and 5 as well as 3. Nevertheless, the rate of moral development in the congenitally blind seems not to be similarly affected by lack of vision. The dimension of retributive and distributive justice, for instance, develops at the same rate in the two samples. A possible explanation could be Nass' (1974) speculation that 'common experiences' may promote the authority-independent attitude. An alternative explanation, though, seems more plausible. According to Selman (1980) and Walker (1980), the perspective-taking capacity is not necessarily associated with all dimensions of moral reasoning. The variety of linkages that have been proposed (cf. Kurdek, 1978) between the two processes do not invalidate the necessity of perspective taking for moral judgement development. If, in addition, we consider the three moral reasoning criteria as 'structures', the above finding casts some light on the debate concerning the validity of stage models. For Kohlberg (cf. Colby *et al.*, 1983) moral judgement development 'is a single general domain cutting across verbal dilemmas and issues ...' (p. 37). On the other hand, Damon (1977, 1983) and Turiel (1983) argue for a non-homogenous moral system with distinct moral concepts that are applied in different areas. Returning to the point at hand, one could reasonably argue that unfavourable experiences related to obedience and authority create some kind of 'defence mechanism' which promotes the group cohesiveness early in development and modifies their moral reasoning accordingly.

The data bearing on the cognitive reasoning aspects of the blind seem partially to support Piaget's assertion about the delayed developmental pattern in congenitally blind children. The developmental lag, however, doesn't exceed two years, as could be seen from the attainment of discrimination levels B and C by the 8-10-year-old sighted group and the 10-12-year-old blind group. As Piaget maintains, the differences between blind and sighted must be much more evident in earlier stages of cognitive development, although comparisons between congenitally blind and congenitally deaf children disconfirm the suggested pattern of development in the two sensory-impaired populations (cf. Markoulis, 1983).

The prerequisite relationships

For the proponents of the 'necessary but not sufficient' hypothesis (cf. Keasey, 1975; Kohlberg & Gilligan, 1971; Kuhn *et al.*, 1977; Walker, 1980, 1986), the above hypothesis has generally been taken to mean that if a child's judgement has reached a certain stage, the child could successfully solve Piagetian tasks of the corresponding logical stage. Such an ontogenic priority is not fully supported by the current data. Although mature moral reasoning seemed to prerequisite cognitive performance on

developmental level C, the substantial number of subjects in the transitional moral category, with predominantly O developmental level, points to the possibility that there exist a non-consistent cross-sectional developmental pattern. Thus, the relationship between the two operations could be conceived as beginning with a slight promotion in the moral domain, with no evidence of cognitive support, to proceed later to a phase where moral development presupposes consolidated concrete operational thinking.

The 'necessary but not sufficient' assumption received greater support in the blind. Probably due to the restrictions imposed by their impairment on their perspective-taking capacity, cognitive development, to the extent it is present, exerts a more direct impact on moral reasoning development.

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