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DEVELOPMENT OF INTERNAL BODY IMAGE FROM CHILDHOOD TO EARLY ADOLESCENCE [1]

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Summary.—The study aimed at providing a psychogenetic characterization of the developmental patterns through which the graphic representations of the inside of the body progress, and at testing the developmental hypothesis of a progressive integration of genital parts into the internal body image. The drawings of the inside of the body by 360 children of both sexes and of age 5 to 10 yr., and by 213 early adolescents, boys and girls of ages 11 to 14 yr., were analyzed on the basis of a series of qualitative and quantitative criteria. The relationship between age and type of drawing corresponds to expectations in children and appears less linear for early adolescents. Further, data support the developmental process of integration of genitals into the body image and show differential aspects in boys and girls.

As both object and subject of experience, the body has been studied from many points of view: morphology, motility, perception, mental images, cognition, emotions, and social relations. Psychoanalysts vary in their accounts of the development of bodily awareness or of knowledge of the body. They usually discuss such questions in relation to ego organization or object relations (Spitz, 1965). Moreover, psychoanalytic theory has emphasized the importance of libidinal drives and of the erogenous zones of the body and has shown the existence of a series of fantasies regarding one's and others' bodies. The work of M. Klein (1932) and of the English School (Winnicott, 1936; Meltzer, 1967) have analyzed unconscious fantasies concerning the interior of the body as related to nutrition and reproduction, to body orifices, genital organs, the mother's body and its contents. The contributions of genetic psychologists like Wallon (1931, 1954), Zazzo (1948), Piaget (1952), and De Ajuriaguerra (1970), have helped our understanding of how children become progressively aware of their bodies and develop knowledge about their body schema. These authors believe that by the end of childhood, an individual will normally have developed an integrated sense of bodily self.

Research regarding body image and physical changes during adolescence has received considerable attention over the last decade (Thornburg & Aras, 1986) and has focused mainly on such topics as stereotypes of physical attractiveness, the way sociocultural factors mediate psychosocial accommodations to morphological changes, the relationships among body image,

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self-perception, and the timing of physical development. On the whole, this line of research has been more concerned with some aspects of body image such as facial attractiveness and somatotype. This exclusive attention might be expanded in the light of recent conceptualizations by Laufer and Laufer (1984), who along with others (Schonfeld, 1969; Clifford, 1971), consider the restructuring of body image an essential maturational task of adolescence. Most important, in view of mature sexual organization, is the integration of physically mature genitals into the representation of the body.

Drawings of the human figure by children and adolescents have frequently been used in psychological research as a method for studying the development of body image or intellectual and emotional factors (Goodenough, 1926; Harris, 1963; Di Leo, 1970; De Ajuriaguerra & Stucki, 1969; De Ajuriaguerra, 1970) and have been shown to follow precise developmental patterns. Conversely, very little attention has been paid to the interior of the body with the exception of research with adult male subjects by Tait and Ascher (1955) or a few studies of children's and adolescents' drawings and their conceptions of the interior of the body (Gellert, 1962; Brumback, 1977; Bibace & Walsch, 1981; Steward, Furuya, Steward, & Ikeda, 1982; Gibbons, 1985; Amann-Gainotti, Di Prospero, & Nenci, 1989), some of which were conducted within a Piagetian framework (Munari, *et al.*, 1976; Crider, 1981; Amann-Gainotti, 1988).

In contrast with studies by Gellert (1962), Porter (1974), Williams (1979), Glaun and Rosenthal (1987) that focused attention on the number and type of identified internal body elements, the present study aimed at providing a qualitative description of the developmental patterns through which the graphic representation of the inside of the body progress from childhood to adolescence. On account of what is generally known about cognitive development and development of graphic activity in children (Piaget & Inhelder, 1966; Di Leo, 1970) a relationship was hypothesized between development of cognitive abilities and patterns of representation of the inside of the body.

A second aim was to test Laufer and Laufer's hypothesis of a progressive integration of genital elements into the body image by examining whether signs of such integration appear in the graphic material of the subjects and if there were differences between boys and girls.

Method

Subjects

The subjects participating in the present study were (1) a group of 360 Italian children of both sexes, living in the cities of Rome and Potenza, 60 at each of the six ages (5, 6, 7, 8, 9, and 10 yr.) and (2) a group of 213 Italian early adolescents of both sexes, living in the city of Ancona, and

ranging in age from 11 to 14 yr. All subjects were attending public schools in classes corresponding to their ages.

Procedure

Materials.—Subjects were provided white sheets of paper and black pencils and were asked, during an individual administration (Group 1) and a collective classroom session (Group 2), to make a drawing of "how they were made inside their bodies" using the instructions of Munari, *et al.* (1976). No time limit was placed on the completion of their drawings.

Criteria for analyzing drawings.—Drawings were analyzed taking into account a series of peculiar features, some of which had already been observed by Munari, *et al.* (1976). These were four, beginning with (a) the relationship between body walls and internal organs. It was noticed that in younger children's drawings, internal body parts were likely to be drawn inside as well as outside body walls. (b) Again characteristic of younger children's productions was the presence of external elements, such as the navel, facial features, hair, decorative elements (houses, trees), or various nonanatomical elements such as food, feces, or germs. Also observed were (c) the number of identified internal body parts. This number tends to increase with age. The percentage of subjects who drew four or more internal organs was 13.3% at 5 yr., 45.0% at 6 yr., and 58.7% at 7 yr. (d) The correct anatomical location of internal organs and their organization into functional systems was examined. This aspect seems to follow a line of development that starts with the representation of scattered, misplaced body parts and progresses to drawing organs in their approximately correct anatomical locations. Connections between internal parts are initially partial and limited, then become progressively more complete. The final stage appears to be the representation of a complete functional system.

On the basis of these criteria, a series of qualitatively different patterns of organization of drawings were defined and ordered hierarchically so that each level would exclude a previous behaviour, considered more primitive, and include a new, more advanced aspect. The following sequence and coding system was used, in which each level is characterized by main qualitative features that are considered to be structurally sufficiently different to allow an attendable distinction of one level from the other.

Level I: Subjects represent a few scattered organs without an outline of the body. Internal organs may be placed inside as well as outside the body outline. Subjects refuse or are incapable of following the instructions given.

Level II: A limited number of internal organs (1 to 3) are all placed inside body walls. Drawings often include external body parts (navel, hair), decorative elements (houses, clothing), and food.

Level IIIa: External and decorative elements are omitted from drawings.

Internal organs (4 or more) are all placed inside body walls but are spatially erroneously located and/or nonfunctionally juxtaposed.

Level IIIb: Internal elements (4 or more) are all placed inside the body outline and their locations and reciprocal positions are approximately correct, but they are not yet connected together.

Level IVa: Internal organs are connected but in a partial and imprecise way without representation of a complete functional system.

Level IVb: At least one functional system is represented (e.g., digestive, cardiovascular, skeletal) and the elements are complete, connected, and spatially correct.

Results

Developmental Trends in Patterns of Representation of Inside of Body

Drawings of both groups of subjects were classified on the basis of the levels just described by three independent raters, the first author and two graduate students given training. Final classification represented 100% or two-thirds agreement. Tables 1 and 2 show the distributions of drawings of both children and early adolescents which depict Levels I to IVb.

TABLE 1
Levels of Representation of Inside of Body By Age of Children: Percent (*Ns* = 60)

Level	Age (yr.)						*n*	%
	5	6	7	8	9	10		
I	58.3	45.0	43.3	11.6	16.6	5.0	108	30.0
II	33.3	20.0	13.3	15.0	10.0	3.3	57	15.8
III (a-b)	8.3	31.6	23.3	40.0	31.6	30.0	99	27.5
IVa		3.3	18.3	28.3	36.6	40.0	76	21.1
IVb			1.6	5.0	5.0	21.6	20	5.5
Total							360	100.0

In the children's drawings, Levels I and II tend to become less frequent with increasing age, while Levels IIa, IIIb, and IVa show a quantitative progression. Drawings at Level IVb, which include a complete functional system appeared only in subjects of 10 yr. of age.

In drawings by early adolescents, Levels I and II are less frequent than in drawings by younger children (with the exception of 24.9% of Level I at the age of 12). The majority of the drawings are shared between Levels IIIa and IIIb with no developmental trend. Level IVa appears less frequently in drawings of early adolescents than in those by younger children, while there is a slight rise for Level IVb drawings. At no age was there a significant difference between boys' and girls' drawings with respect to the type of drawing.

TABLE 2
LEVELS OF REPRESENTATION OF INSIDE OF BODY BY AGE OF EARLY ADOLESCENTS: PERCENT

Level	Age (yr.)				*n*	%
	11	12	13	14		
n	58	72	63	22		
I	10.7	24.9	11.1		31	14.5
II	16.0	8.8	4.7		18	8.5
IIIa	41.0	40.2	36.5	59.1	88	41.3
IIIb	24.3	12.4	20.6	31.6	44	20.6
IVa	1.7	4.2	15.8	4.5	15	7.0
IVb	5.3	9.7	9.5	4.5	17	8.0
Total					213	100.0

Integration of Genital Parts Into Drawings

In Munari, *et al.*'s research (1976), conducted with 635 children of both sexes, aged 5 to 13 yr., 18.5% were observed spontaneously to represent reproductive organs, and boys were more likely to do so. Also Amann-Gainotti, Di Prospero, and Nenci (1989), in a study of adolescent girls' representations of their genital inner space, remarked that there was a progressive, although irregular, increase over age of the number of subjects who

TABLE 3
NUMBERS OF SUBJECTS WHO INDICATE GENITAL PARTS IN THEIR DRAWINGS OF INSIDE OF BODY

Sex		Age (yr.)									
		5	6	7	8	9	10	11	12	13	14
Girls	Frequency	1	1	4	1		2	7	6	3	4
	Total	32	34	28	29	30	38	27	34	30	11
Boys	Frequency	4	4	1	3	3	5	9	11	9	8
	Total	28	26	32	31	30	22	29	38	33	11
Total	%	8.3	8.3	8.3	6.7	5.0	11.6	28.5	23.6	19.0	54.5

included reproductive organs in their drawings of the inside of the body. An analytical description of the number of subjects, boys and girls, aged 5 to 14 yr., who spontaneously included genital parts in their drawings is presented in Table 3. The percentage of subjects who represented genital organs began to increase around ages 10 to 12 and sharply increased at 14. Boys were more likely to draw genitals in both the 5- to 10-yr.-old group (10.3% boys, 5.5% girls) and in the 11- to 14-yr.-old group (boys 37%, girls 17%). Differences between boys and girls were statistically significant for the early adolescent group ($\chi^2 = 8.14$, $p < .05$) but nonsignificant for the children ($\chi^2 = 3.16$, $p < .05$).

Conclusions

The results of this study which aimed to characterize the development of the internal body image allow, for the sample examined, some preliminary considerations. The characteristics observed in the drawings of subjects aged 5 to 7 yr. are in line with the observations of Munari, *et al.* and with regard to the difficulties younger children have in drawing the body and including internal parts. Munari suggests that these difficulties could be related to the more general inability, typical of this younger age, of reasoning simultaneously about the whole and its parts and to perform operations of inclusion. Similarly, the tendency observed in the younger subjects to depict body parts externally, as well as decorative elements, clothing, etc. could be related to the well-known "intellectual realism" (Luquet, 1927) whereby subjects try to represent all the elements of a significant object.

The increase with age in the number of internal parts drawn and the progressive precision in the anatomical locations of internal organs is not surprising. It is most likely based on experience and environmental influences, especially education.

On the basis of observations, the representation of complete functional systems seemed to pose major difficulties, for only a few subjects showed such behaviour. In the majority of cases the respiratory and the skeletal systems were drawn.

The developmental sequence depicted in the graphic representation of the interior of the body as outlined in this study, is supported by the quantitative relationship (expressed in percentages) between age and type of graphic representation. In children, the relationship between age and type of drawing evolves linearly, whereas the productions of subjects aged 11 to 14 yr. seem to follow a more irregular trend. This is suggested to be related to the process of destructuring/restructuring of body image which seems to occur during early adolescence.

Laufer and Laufer's (1984) developmental hypothesis regarding the integration of genital parts into the representation of the body is supported by present findings. An increase was observed around puberty in the number of subjects who spontaneously included genital organs in their drawings of the inside of the body. In further studies with adolescents, the importance of this process should be verified along with the comparison of its qualitative and temporal aspects in drawings by boys and girls, since data reported by Fisher (1986) showed that girls seemed to identify and understand genital differences earlier than boys.

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