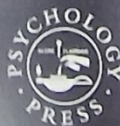# The Child as a Cartesian Thinker

Children's Reasonings about Metaphysical Aspects of Reality

Eugene V. Subbotsky

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Contents

Introduction

The idea of the study presented in this book stems from my long and strong interest in Descartes' philosophy and yet it came to me quite accidentally. In late September 1980 I and my four-year-old son Alyosha got stuck on the seashore of Crimea. The weather was nasty, it was raining days and nights, but the time for departure was yet to come. Contrary to my rule not to work in vacations, I started to reread selected works by Descartes which I found in my suitcase. Suddenly, it occurred to me that it might be interesting to ask my son a few questions that Descartes asked himself and which I felt were almost irrelevant to the age of the person to whom they were addressed.

'Do you think that you exist in the world?' I started my conversation with my son. 'Yes, I do' he said.' 'And do you have dreams sometimes?' 'Yes, I do.' 'Did you see sometimes in your dreams an object or a person which did not really exist?' 'Yes. I did. Once I saw a monster.' 'But can this be the case that it is now that you are dreaming and imagining that you exist, but in reality you don't exist, like that monster of yours?'. For the moment my son was puzzled; he looked around, apparently in the search for a suitable answer, then he said 'Well, I know that I am not sleeping now.'

This wasn't a particularly profound answer, but it was a start. I got interested in this and kept asking questions. They were questions about the relationships between body and mind, between sensory images and physical objects, about definition of truth, about existence of the Supreme Being, etc. What struck me was that my son didn't find any of these questions unusual or odd, and he had answers of his own to nearly all of them.

So, as soon as I was back to Moscow, I created the dialogues and started my 'Cartesian conversations' with children, at first in a nearby kindergarten, then in local schools. Soon I found that although children's answers varied widely, there was some 'inner logic' visible behind them. Surprisingly, most children discussed these metaphysical problems as if they've long been thinking about them, although I knew that they didn't. What was it, then?

It occurred to me that the problems were fundamental and as such to a large extent irrelevant to a subject's age. Of course, the ways these problems are presented to children of different ages can vary, as well as answers that the children give to the

problems and that depend on the level of the child' intellectual and linguistic development. Yet, as soon as the child comes out of the age of infancy he or she is confronted with these problems and has to resolve them in one or another way, even if at a subconscious level and without being aware of that. It appeared that these solutions did change with age, yet not all of them changed, and the changes were slow. The basic flaw was towards the solutions suggested by Descartes: the older the children were the more 'rationalistic' were their views on many metaphysical problems. However, some of the problems seemed to follow a˙ reversed order: young preschoolers reasoned very close to the way Descartes did, but schoolchildren did not. There were also some Cartesian ideas that happened to be totally alien to the children: both to the younger and older ones. It became clear that the model of a steady intellectual progress as a 'growth of mental functions in structural complexity' was not the best way to account for the development of metaphysical judgements in children.

  While carrying on with the study, I started to look around for what has been done on the topic in developmental psychology. Of course, I was well acquainted with early Piaget's studies, in particular with the 'Child's conception of the world'. Although metaphysical problems had been touched upon in these studies, Piaget's major interest has been increasingly focused on sciences and the development of scientific thinking, as well as on children's acquisition of those specific notions (like number, logic, necessity, causality) which lay the foundation of scientific thinking and yet, as it stands, are entirely withing the scope of 'physics' (or in the scope of science, to be exact) and are not 'truly metaphysical' by the definition (see above). Many of the recent studies of children's judgements on metaphysical problems were inspiring and intriguing, however, they lacked coherence and seemed to hit isolated problems (such as children's judgements on the relationships between body and mind, on death and dying, on the distinction between animated and nonanimated objects, etc.). A certain unified and systematic study of the development of metaphysical judgements in children appeared to be necessary.

  As far as I realized this, I decided to extend the study to include children's judgements on metaphysical problems of a human being. While creating a new set of dialogues, I extensively used rationalistic models of a human being inserted in many contemporary psychological developmental theories, for instance, in Vygotsky's theory of mental development. I also applied a model developed by another distinguished French rationalistic philosopher Condillac who invented an amazingly simple way of talking about human senses and their relationships with physical

objects. Conducting these dialogues with children was especially interesting for me because I have long been puzzled by the lack of psychological education in kindergarten and school curriculums, to say nothing about discussing problems that go beyond psychology in its own right, such as relationships between personal freedom and moral feelings and actions, the fundamental drives of a human individual for development and expansion of his or her needs and passions, for eternal life, for a 'dreamlike world' of accomplished wishes, etc. Studying psychological development of children, many of us seem to have little interest to what the children themselves might think about it. However, even a superficial observation shows that children as young as 5 are interested in and do have theories about human development, and not only about human birth. And again, I found certain trends in children's judgements about human sensations, the role of language, relationships between moral knowledge and moral behavior, between human feelings and human behaviors, etc., which in some respects were very much in line with certain general˙ laws of children's intellectual development, and in other respects substantially deviated from them.

   While conducting the study, I was fully aware that there was no other ways of learning about children's metaphysical notions than talking with children. In fact, it was mostly nonverbal methods that were employed in the studies of children's cognitive and personality development published in my previous books (Subbotsky,1993, a,b). Nonverbal methods, which are highly effective in the studies of various aspects of child development, would be unsuitable here. It was also clear to me that much would depend on the child's language and his or her capacity to express what he or she thinks, and so qualitative, rather then quantitative, analysis of children's answers would be of major importance. Finally, it was obvious that the study would have to be primarily phenomenological: the causes of the development of children's metaphysical thinking are too multiple and complex in order I could hope to determine but a few of them. So, I decided as far as I could to follow Teilhard de Chardin's maxim 'Rien que le Phénomene. Mais aussi tout le Phénomene.' ('Nothing but a phenomenon. But, as well, the whole phenomenon.')(Teilhard de Chardin, 1955, p.21).

   Of course, I didn't think that what children say was a good indicator of what they would do; in fact, two of my previous books were about discrepancies which often occur between people's words and their deeds (Subbotsky, 1993 a,b). But I do believe that what children say reflects what they think, provided that questions are clear for them, there is no reason for them to conceal their˙ thoughts and their language is good enough. As a result of this

study I found that in certain respects children indeed reasoned like little rationalists. Even so, it looked like their rationalistic views had to be developed, mainly through the independent work of their minds. It seemed also that this development is highly important for the children's later achievements, both in intellectual and in social domains. Indeed, whether we wish it or not, in European cultures sciences, laws, arts, and even religious beliefs have been heavily influenced by dominant rationalistic views; in order to succeed in learning and in life the child has to learn first this 'language of metaphysics' which will later enable him or her to cope with scientific education and social laws. Therefore, the child has to acquire certain metaphysical proficiency very early in life. This was another reason why I found the study interesting and inspiring.

To a large extent this was an individual and solitary work. However, it might have never appeared if once upon a time I didn't come to a lecture on Descartes delivered by a brilliant philosopher and an outstanding person Mirab Mamardashvili. I thank Dr. Margaret Chalmers and Dr. Les Smith for their careful reading of the manuscript and constructive comments. I do feel grateful to the children who shared with me the labor and pleasure of talking about metaphysics, and to my students who joined me in this. And I am in debt to the schoolteachers who, although puzzled, allowed me to keep asking the children the strange questions.

Chapter 1. THE CHILD AS A PHILOSOPHER

1.1 Studies of children's metaphysical thinking in developmental psychology

1.1.1 Physics and metaphysics: conceptual relationships

A subject of the book is children's judgments about some metaphysical notions which , according to many philosophers (i.e. Husserl, 1977), laid a foundation for the contemporary European world outlook. In contrast to most general physical concepts (such as concepts of space, time, causality, physical object, etc.), metaphysical concepts (in the original Aristotelian meaning of the word) belong to the realm that extends 'beyond physics.' This realm is rather difficult to capture by rigor definitions. Although it intersects with many sciences (such as psychology, logic, biology, theology, etc.) it, nevertheless, transcends their traditional limits.

Thus, for instance, such a notion as 'the criterion of truth' is a traditional subject of logic, however, in its deepest roots

it goes beyond logic and to the realm of primary intuitions regarding what can be called 'true' and 'false'. The concept 'a living cell' is a subject matter of biology, but the quality that distinguishes a living cell from a dead one (and any living creature from an inanimate object) life in its own right - escapes definitions in rigorous biological terms. Psychology, in a sense, stands closer to metaphysics than any other science, however, due to the dominance of scientific mode of thinking in our culture most psychological studies have been conducted in a traditional empiricist manner which prevented psychology from entering the realm of metaphysics.

To put it in other words, metaphysical concepts are those that reflect our most general beliefs about the world which constitute a foundation for a scientific approach to nature, but which cannot be proved or disproved by means of traditional logic. Similar to religious beliefs, metaphysical beliefs are culturally and historically biased and in that respect they are myths; however, these beliefs differ from religious beliefs and other traditional mythological systems in one important aspect: they appeal not to certain dogmatic structures imposed on the individual by society, but to the primordial intuitions of the individual himself or herself, to certain 'a priori' given anthropological characteristics of a human individual. In other words, if religious beliefs are to be accepted by the individual before any sensible and consistent 'religious truth' can be discussed, metaphysical beliefs from the very beginning appeal to the individual's critical thinking and to his or her primary intuitions about what is 'really true' in this world and what is clear and obvious to such an extent that excludes any possible doubts.

The studies presented in the book will be focused on one particular group of metaphysical beliefs, namely, on those that constitute a foundation of European rationalistic (or some would say, modern) type of thinking. European rationality is interpreted here as a specific spiritual orientation of European (or, speaking more broadly, Western) mentality that has its origins in the antique Greece and whose modern features were outlined most clearly and explicitly in XVII-XVIII centuries in the works of many European thinkers, especially in those by Descartes and Kant. The main feature of this mental orientation was Antidogmatic: the individual's claim to perceive and master the world 'directly' and rely exclusively on one's own personal authentic experience. This mental orientation manifested itself in a number of special structures, i.e., conceptions about consciousness, being, truth, relationships between mind and body, image and object, etc. It also created a particular 'model' of man:

a special view on functions, capacities and development of the human mind.

1.1.2. Justification of the study

As it has been mentioned above, for the last few centuries Western rationality greatly influenced the whole body of European (and not only European) culture and penetrated all its components: sciences, arts, law, education, religion itself. This means that fundamental ideas of Western rationality (such as 'body/mind parallelism', the identity between 'being and thinking', between 'being and truth', etc.) are no longer the intimate scope of philosophy but compose an implicit foundation for the 'everyday' consciousness. Of course, the term 'European culture' is not linked here to a certain geographical or national region and would include all the countries that absorbed the fundamental elements of the culture that has its origins in Europe.

 In other words, in order to be able to live in a
modern European culture,
an ordinary person has to be able to act
and think, consciously or unconsciously, in accordance with these fundamental structures. It means also that these fundamental structures (ideas, intuitions) have to be acquired by children in their early years since most of the more advanced and sophisticated structures (such as basic notions and laws of arts and sciences taught at school) are based upon these metaphysical ideas. The delay or distortion of this acquisition may influence the child's performance at school and his or her general adaptation to culture.

Considering all this, there are at least two considerations that can justify the study of metaphysical thinking in children.

The first of them is mainly of theoretical and philosophical nature. As it has been said, a system of metaphysical structures that constitute a core of Western rationality is a system of concepts that extend beyond physics and, in fact, beyond logic. As axioms of geometry, metaphysical 'axioms' are structures to 'be believed in', and not 'to be proved' by logical or scientific means. As such, metaphysical beliefs are similar to religious beliefs; yet they constitute a specific world outlook which is different, if not alternative, to the existing religious mythologies.

The relationships between the rationalistic view of the world and the traditional religious one has long become an issue of importance and is discussed under various names, such as the relationships between science and religion. In this kind of discussion a priority of scientific approach over religious one

is often seen in empirical and logical nature of science; at that it is often overlooked that science itself is based on a system of beliefs those that we call metaphysical beliefs. Yet, it is generally assumed that there is a fundamental difference between metaphysical and religious systems of beliefs: whereas the latter is culturally and historically biased, the former is rooted in human anthropology and is largely culturally invariant. Another consequence of this concerns a developmental aspect: if metaphysical beliefs are indeed of natural-anthropological rater then of cultural-historical origins, then they can be expected to appear in children at an early age and without special teaching that any religious education requires.

But is this really the case? Can, for instance, the beliefs in body/mind parallelism or in the distinction between subjective images and the objects in their own right be traced in very young children as something that appears spontaneously, or they have to be taught as well as any other system of beliefs? And if they can does the whole bunch of metaphysical beliefs appear at one time or there is a developmental succession in their appearance in the child's mind? Answers to these question can shed additional light on the issue of the 'ultimate foundation of science', that is on the problem whether science is reflecting some kind of 'fundamental truth' about the world or it is culturally and developmentally determined and creates a model of the world that has no 'primary' advantage over the traditional religious models.

The second consideration is of a more practical nature. It refers to the fact that whatever the status of Western rationality with regard to the traditional religious mythology is, this rationality is already here and has to be acquired by a child in this or another way in order the child could be able to deal with more advanced 'stores of knowledge' (like sciences, arts and languages). The system of metaphysical beliefs is itself a specific 'language' which, as any other language, is acquired by a child spontaneously and mainly on the subconscious level. Under normal circumstance we don't have to consider this 'language acquisition' process at all and the task of its scientific investigation seems superfluous. Yet there are cases in which this kind of study becomes important and necessary.

Thus, for instance, in ordinary life a fundamental metaphysical distinction between psychological and physical ways of description of one and the same object seems to be of no major importance. Indeed, in our everyday language we normally describe a certain object as, for instance, red in color, round in shape and heavy, and not as the one which reflects light rays of a certain wave lengths and is affected by the force of gravity of a

certain strength; more than that, in ordinary life psychological sensations quite successfully represent their physical prototypes and the 'split' between the two can be largely ignored. In fact, even some of professional psychologists might think that it does not really matter whether a subject understands that 'redness' or˙ 'heaviness' of the object are not its real physical properties and in order they could be attributed to the object in its own right, they have to be translated into the language of physical theories (like the wave theory of light or gravitational theory of matter).

However, if the subject enters the world of science without having a proper metaphysical intuition about the psychophysical parallelism it may be more difficult for the subject to understand elementary physics. And even in ordinary life the lack of proper understanding of this distinction can foster in the subject an egocentric confusion between his or her feelings and views about objects and events and the objects (the events) as they 'really are'. It is, therefore, quite important to examine the way children acquire fundamental intuitions about the doubled character of reality in which almost every object exists in at least two separate manifestations: as a subjective image (a visible image of a cube, for instance) and as its rational construction (the same cube as a physical body with such unchangeable characteristics as magnitude, shape, molecular structure, etc.). Despite the fact that much of psychology was devoted to the examination of how certain rational constructions develop in children (for instance, various concepts of conservation), very little is known about the onset of the general understanding of this fundamental rationalistic distinction. The same is true with regard to other basic metaphysical structures of Western rationality. However exotic this topic may seem at the first glance, it is of crucial˙ importance for our proper understanding of how our mind works.

1.2.3. Experimental studies of metaphysical thinking in children: the problem of methodology

Although investigation of the children's concepts about the world has a long tradition in developmental psychology, it has mainly been focused on the development of the prerequisites for scientific and physical concepts in children, such as causality, reversibility, logical and physical concepts, etc. (see Piaget, 1925, 1930, 1962). Over the recent decades a number of new problems which were more closely related to metaphysical concepts attracted attention of the developmentalists . These included children's developing conceptions of mind and mental processes

(Harris, 1990; Baron-Cohen, Leslie & Frith, 1985; Flavell et al.,1981; Pillow & Flavell, 1986; Surber, 1980; Lewis & Osborn, 1990), of the origins of illness (Gratz & Pilivian, 1984; Kister & Patterson, 1980), of procreation and child development (Goldman & Goldman, 1982; Russell & Russell, 1982), about death (Weininger, 1979; White, Elson & Prawat, 1979). These studies, however intriguing and important in their own right, touched upon metaphysical problems only indirectly; most of them were still devoted to matters conceivable within the scope of modern science.

There appeared, however, studies that are of a particular interest within the context of this book; they directly dealt with the development of metaphysical concepts, such as children's concept of God (Nye & Carson, 1984), of relationships between mind and brain (Johnson & Wellman, 1982; Johnson, 1990), mind and body˙ (Inagaki & Hatano, 1993), real and apparent (Flavell, 1986; Harris, 1989), children's insights in the nature of consciousness (Flavell et al., 1993). In his pathbreaking book Matthews (1980) collected and analyzed cases of children's philosophical judgements; he showed that even young children were able to produce pieces of genuine philosophical reasoning concerning such fundamental metaphysical problems as the distinction between dream and reality , animated and nonanimated objects, the problem of personal identity, relationships between sensory images and real physical objects, and others. There are several points in this book that seems to be especially relevant to the study of children's metaphysical judgments. Firstly, it clearly showed that in certain circumstances children as young as 4 years can produce questions about and be puzzled with problems that traditionally belong to the scope of metaphysics. Secondly, it casted new light on the difficult question about interpretation of children's metaphysical judgements; in his criticism of Piaget's stadial approach Matthews argues that many fundamental philosophical problems have not privileged 'correct' solution and that many of those answers that Piaget interpreted as reflecting the most primitive lower stage (for instance, answers suggesting that people think with their 'mouths' or 'voices') have their theoretical merits to no lesser extent than those considered by Piaget as the most 'progressive' ones. Obviously, this undermines Piaget's stadial approach and what might be called the 'replacement model' in understanding children's intellectual development (see Subbotsky, 1992). Thirdly, the book contains many˙ interesting intuitive observations, for instance, of the fact that young children are more likely to produce genuine philosophical judgements than are the children of more advanced ages partly due to their unrestricted naivete and partly because of the absence of pressure from the institutionalized education.

So, perhaps, it is philosophy and logic that should deal with the development of children's metaphysical judgements? The fact is, however, that children's metaphysical judgements belong to philosophy to no larger extent than children's judgements about physical causality belong to physics or children's naive theories of language belong to linguistics. However interesting and genuine, these judgements are occasional and sporadic experiences; in order that they could be incorporated in the body or a certain philosophy they have to be interpreted and it is the interpretation of the judgements by a philosopher taken together with the judgements themselves that makes the judgements 'a piece of philosophy.' In a sense, the early philosophical maturity of children is similar to the early 'cognitive maturity' of infants: when it is said that a few months old infant can make 'inferences' about objects' physical properties it is often forgotten that all the striking capacities are merely behavioral patterns which, in order to be viewed as 'inferences,' have to be interpreted by an experimenter. And who can be the interpreter with respect to children's metaphysical judgements? In my view, it doesn't really matter whether it would be a psychologically educated philosopher or a psychologist with some background in philosophy. What matters, however, is a framework or a scale which might be˙ employed as the basis for the interpretation.

Regarding children's judgements about various scientific concepts the framework employed normally is existing scientific concepts and theories. Since in sciences the concepts 'truth' and 'false' are used in their rigorous sense, the children's judgements can be classified along the scale as corresponding or not to the theories that are viewed as 'true' in contemporary science. With respect to metaphysical judgements the solution is not that simple. As it has been mentioned, most metaphysical problems have no definite 'true' solutions; instead, they allow for various, often conflicting, interpretations.

This fundamental fact has two important implications which would account for the differences between the traditional studies of cognitive development of the child and the growth of the child's 'metaphysical proficiency'.

Firstly, in order to have a relatively stable scale in our work with children we have to consider what of many existing (and conflicting) metaphysical systems could be chosen as a framework for our analysis. As far as varying systems can provide different solutions to similar metaphysical problems, the task of the choice becomes rather difficult.

Secondly, a traditional way of viewing cognitive development as a succession of stages which progressively lead the child to the top of the 'pyramid of cognition' can hardly be applied to the˙

development of metaphysical knowledge.

The view which is traditionally (and with good reason) ascribed to Piaget (see Piaget, 1936; 1986; Matthews, 1980; Johnson- Laird, 1990; Bremner, 1994; White, 1995) albeit some unorthodox interpretations of Piaget's views on development (Smith, 1993).

The reason is not that a system of successful stages is a wrong mode for accounting of cognitive development, but rather that this model works better in the areas in which it was originally created, namely, in the area of the acquisition of scientific or social knowledge. In contrast to this kind of knowledge, metaphysical beliefs do not possess a certain definite structure (in contrast to, for example, visual perception or logical thinking) and their development cannot, therefore, be portrayed as a teleological progression which would steadily approach the top of its structural complexity by successively 'building up' new stores on the existing foundation.

Yet it does not mean that a concept 'development' can not possibly be applied to the growth of metaphysical concepts. There is no doubt, for instance, that certain differences (which can even be viewed as some kind of 'stages') can be expected to exist between metaphysical proficiency in children of varying ages and, possibly, varying cultures. This development, however, rather takes the shape of 'growth of awareness' then is traditional mode of 'growth in complexity': the steadiness that can be expected from this kind of development manifests itself rather in the easiness and mastery with which children of various ages can realize and express metaphysical problems then in 'presence versus absence' of these problems in the child's life and mind. In other words, the development of metaphysical understanding can be put as the constantly widening 'fundament' on which the 'pyramid of cognitive growth' is being built.

It can also be expected that this kind of development would be a rather spontaneous one, that is, triggered by the spontaneous activities of the child's mind and personality. Of course, it doesn't exclude certain social and cultural influences on children answers to questions about metaphysical problems. However, because of the very nature of metaphysical problems which are rooted in the foundation of an individual mind and represent the 'anthropological essences' of a human individual rather than his or her social and cultural belonging, the cultural influences could be expected to be much less impressive than, for instance, they are in the area of traditional learning of various disciplines, no matter scientific, social or religious.

Returning to the fact that solutions of metaphysical problems are inherently 'open to interpretations', it becomes clear that in order to have a relatively stable scale in our work with children one of these interpretations has to be chosen. In the study

presented in the first part of this book Rene Descartes'
'Meditations on First Philosophy' and his 'Discourse on the
Method' have been chosen as the basis for such a scale.

Although Cartesian philosophy cannot be exclusively
identified with the Western rationalistic tradition and reflects
only one, thought major, trend within this tradition, there were
several reasons that prompted me to select these particular
writings. Firstly, they are classical masterpieces of philosophy
which draw upon most interesting metaphysical problems, such as
problems of finding the truth criterion, of relationships between
body and mind, between true knowledge and personal existence,
between physical objects and their sensory images, etc. Secondly,
all these fundamental problems are given certain clear solutions
which, although they are not 'absolute,' nevertheless have been
accepted by many and even laid a foundation of the modern
rationalistic world outlook (Husserl, 1977). Thirdly, in contrast
to other existing interpretations of the rationalistic philosophy
(such as, for instance, those given by Kant or Hegel) which employ
a lot of special terminology and sophisticated philosophical
techniques, these works by Descartes have some kind of
intellectual freshness and naivete about them features that do
not undermine their profound philosophical nature but at the same
time make them perfectly suitable for an adaptation if dialogues
with children is the aim. Last but not least: these pieces of work
present a system of metaphysical questions in a compact way as a
certain philosophical and logical unity in which, nevertheless,
several successive and consistent steps can be distinguished.

Clearly, employing this kind of 'frame of reference' would
give us an opportunity to classify children's answers according to
their proximity to the solutions given by Descartes the kind of
subordination which does not necessarily imply the concepts of the
'philosophical progress' and of any ultimately 'right' solutions
but which, nevertheless, is not an arbitrary classification either
since the subjects under investigation belong to the culture whose
metaphysical foundations are supposed to have been laid down by
philosophers like Descartes.

A second problem that arises if children's metaphysical
judgements are to be studied is the problem of finding an adequate
methodology. In the previous studies three basic methodologies can
be distinguished. The first one was a case study based on the
collection of children's spontaneous metaphysical questions and
judgements (most consistently this methodology was applied by
Matthews in his 'Philosophy and the Young Child', 1980, and
'Dialogues with children', 1984). Along with obvious merits this
methodology has serious drawbacks: it depends on children's
sporadic reasoning given under various, mostly uncontrolled,

circumstances. Children's judgements like that do have metaphysical truth in them, but they are difficult to interpret along a unified scale and touch upon occasional and mostly unconnected one to another metaphysical problems. Besides, developmental psychology deals with mass samples of children and not all of them are capable of putting interesting metaphysical questions, although metaphysical problems, no doubt, challenge every child.

In contrast to the first kind of methodology, the second kind of methodology is strictly oriented towards following a classic model of scientific experiment (see, for instance, Johnson & Wellman, 1982; Johnson, 1990). According to this methodology, children are asked metaphysical questions in a certain standardized way and their answers are reduced to 'yes' and 'no.' This methodology makes coding and application of traditional statistical analysis (such as analysis of variance) easier but it obviously lacks the flexibility of the 'case study methodology.' Clearly, reasons why different children answer 'yes' to one and the same question can vary, and what this method misses is, perhaps, the most important and interesting part of metaphysical˙ judgements the very process of 'metaphysical meditation.' The problems of whether children's judgements about certain cognitive tasks (i.e., conservation) should be completed with justifications, and about the status of the justifications as reliable indices of children's cognitive capacities have recently been debated (Light, 1986; Flavell, Miller & Miller, 1993). Some authors argue that relying exclusively on children's judgements (by which brief answers of 'yes' or 'no' type are meant here) without justifications can be misleading in the assessment of children's operational skills (Neilson, Dockrell, & McKechnie, 1983), others view justifications themselves as a possible source for a misjudgment about children's capacities of understanding (Breinerd, 1973; Donaldson, 1983). It is argued, for instance, that justifications are strictly required in case of studying children's understanding of necessity (Smith, 1993).

It was accepted in this study that in the case of metaphysical problems too justifications were necessary as nearly all metaphysical problems are rather ambiguous and cannot be shaped in the form of a clear experimental test of the type conservation is tested. It is essential, therefore, while asking children questions like whether they really exist in the world or just have an illusion (a dream) about their personal existence to supplement the question by requests for justifications, otherwise the child's positive answer would be indefinite with regard to the very point of the question, namely, whether the child can understand the necessity of the link between having a

consciousness of a certain subjective state (like a dream or a·
hallucination) and personal existence, or he/she simply states it
as an empirical fact ('I know that I exist', 'My mum told me that
I exist').

The third type of methodology is the one used by Piaget in
most of his studies. It is a sort of a 'directive clinical
interview' in which children are asked a set of standard questions
(to be exact, Piaget himself never strictly observed the procedure
varying slightly questions from child to child) and encouraged to
justify their answers. It is the justifications (or reasoning)
given by children and not their 'yes' or 'no' answers that is to
be a subject for analysis and classification within this
methodological approach. This approach, if applied, produces a
rather diverse specter of answers which is more difficult to
analyze statistically than are the dichotomic answers, but it
reflects a real richness and diversity of possible solutions for
metaphysical problems.

This is the third type of methodology that was applied in the
mainstream of studies presented in this manuscript. In contrast to
Piaget's original procedure, however, in this study all the
children were asked identical questions and their answers,
together with the justifications, were classified on the basis of
a standard 'frame of reference.' Nevertheless, in several special
cases I did not stop at registering children's answers and
justifications and continued with the interrogation in the form of
a discussion. The aim was to determine how firmly children's
answers reflected their real convictions and whether the children
were able to withstand objections to their views. These deviations·
from the standard procedure will be analyzed separately.

There were also two studies conducted in compliance with the
traditional analytical tradition of experimenting in psychology
(see analytical studies on the basis of Dialogue 6 and Dialogue
7). The objective of these studies was to create a link between
phenomenological and analytical types of studies and to show that
phenomenological study can be viewed as a first step of a more
extended analysis and can be later developed in a traditional
analytical investigation targeting theoretical (Dialogue 6) or
applicational (Dialogue 7) questions. Lastly, replications of
the most important dialogues in Britain were done to appreciate the
role of cultural and contextual factors in the development of
metaphysical judgements in children.

**1.2 Descartes' 'Meditations on First Philosophy' as a framework
for the study of children's metaphysical judgements**

In a chain of Descartes' discourse seven main steps can be distinguished (which can also be traced down in other works by Descartes, such as 'Discourse on the Method', 'Principles of Philosophy' and others). The *first step* is a brief introduction in which Descartes states that all of his knowledge and views acquired till this moment are highly contradictory and unreliable and can be put under doubt. Therefore, he says 'it was necessary, once in the course of my life' to demolish everything completely˙ and to start again right from the foundations, if I wanted to establish anything at all in the sciences that was stable and likely to last' (Descartes, 1988, p.76).

The *second step* consists in the outlining limits of this doubt. It turns out that not only the facts that had been learned at school are doubtful but also some pieces of knowledge that earlier seemed to be absolutely obvious and true. The latter are the belief that images of objects (including the image of our own body) which our sensations provide us with represent the objects 'as they are in their own right', the belief in the existence of the external world, and even the belief in our personal existence. One reason for such a profound doubt Descartes sees in our susceptibility to perceptual illusions: everything, he says, that 'I have now accepted as most true I have acquired through the senses. But from time to time, I have found that the senses deceive, and it is prudent never to trust completely those who have deceived us even once' (ibid, p. 76). Another reason he finds in the fact that it is impossible to stand an absolute border between dreams and reality. Since in dreams things can appear to me different from what they are in reality and I can even have images of objects that actually do not exist, my doubt has to be radical reasons Descartes. It is possible that at this very moment I am dreaming and, therefore, not only shapes of objects are different in reality but the objects themselves do not exist and the whole world is nothing but a mere illusion. 'I shall consider myself as not having hands or eyes, or flesh, or blood or senses, but as falsely believing that I have all these˙ things'(ibid, p.79).

Having performed this crucial doubt, Descartes makes the *third step*. If I can go that far as to have doubts about the very existence of the world reasons he then is there anything at all I can consider to be the truth? Answering this rhetorical question Descartes formulates his cardinal metaphysical discovery: 'cogito ergo sum': 'But immediately I noticed that while I was endeavoring in this way to think that everything was false, it was necessary that I, who was thinking this, was something. And observing that this truth 'I am thinking, therefore I exist' was so firm and sure that all the most extravagant suppositions of the

sceptics were incapable of shaking it, I decided that I could accept it without scruple as the first principle of the philosophy I was seeking' (ibid, p.36).

The next three steps (*the fourth, the fifth and the sixth*) of Descartes' discourse consisted in the explication of the content that is already incorporated in 'cogito' implicitly. They are (step 4) the idea of the fundamental distinction between body and mind, (step 5) the definition of truth criterion and (step 6) the so called 'ontological proof' of the 'perfect subject' existence. First of all, he states that such attributes as 'shape', 'spatial location', 'movement', 'weight', 'nourishment', 'divisibility', 'accessibility to our senses', etc., belong to our physical body but not to our mind. The essential feature of the mind is thinking, which Descartes subdivides into several kinds: there is thinking in the form of doubt, in the form of imagination, in the form of feeling, etc. If I can see light and feel warmth, Descartes says, all this can be a mistake, but 'I certainly seem to see, to hear, and to be warmed. This cannot be false; what is called 'having a sensory perception' is strictly just this, and in this restricted sense of the term it is simply thinking'(ibid, p.83).

Therefrom, Descartes draws the conclusion about principal independence of the human mind from the body and about the possibility of the mind's posthumous existence: 'on the one hand I have a clear and distinct idea of myself, in so far as I am simply a thinking, nonextended thing; and on the other hand, I have a distinct idea of body, in so far as this is simply an extended, nonstinging thing, and accordingly, it is certain that I am really distinct from my body, and can exist without it.'(ibid, p.114-115). At the same time, the inseparable link between mind and body is evident either: 'I am not merely present in my body as a sailor is present in a ship, but...I am very closely joined and, as it were, intermingled with it, so that I and the body form a unit' (ibid, p.116).

Extension of the 'cogito' based meditation brings Descartes to the problem of determining the truth criterion: he comes to the conclusion that the necessary and sufficient criterion of the true knowledge is in its clarity and distinctiveness. This means that the true knowledge 'can speak for itself': 'I observed that there is nothing at all in the proposition 'I am thinking, therefore I exist' to assure me that I am speaking of the truth, except that I see very clearly that in order to think it is necessary to exist. So, I decided that I could take it as a general rule that the· things we conceive very clearly and very distinctly are all true. only there is some difficulty in recognizing which are the things that we distinctly conceive' (ibid, p.36).

Proceeding with the analysis of 'cogito' Descartes discovers that there is in it, along with the ideas about thinking, body, truth, etc., also the idea of the 'perfect subject.' Indeed, the essential feature of 'cogito' is doubt, that is a state of a subject that has certain unsureness and imperfectness (insufficiency) in it; therefore, a subject who is fulfilling 'cogito' can be conceived only in a contrast to the subject who is perfect and possesses all the attributions of 'perfectness': omnipotence, omnipresence, etc. In Descartes' terms the subject is God. An important feature inserted in this conclusion (which for most people is notoriously difficult to understand) is that having a single idea of God is a sufficient proof of God's actual existence. This is the case because the denial of God's actual existence is contradictory to the idea of God's perfectness: '...from the fact that I cannot think of God except as existing, it follows that existence is inseparable from God, and hence that he really exists. It is not that my thought makes it so, or imposes any necessity on anything; on the contrary, it is the necessity of the thing itself, namely the existence of God, which determines my thinking in this respect. For I am not free to think of God without existence (that is, a supremely perfect being without a supreme perfection) as I am free to imagine a horse with or without wings' (ibid, p.107).

In the concluding part of his discourse (the *seventh step*) Descartes returns to the problem of the external world's existence. If I have images of things, he reasons then there is something in the outer world that had initiated these images. But in no case are these images identical with those external objects that have caused them as they are in their own right. Color, warmth, pain, etc. belong to the subject and not to eternal objects. If I can feel heat and pain from a fire, Descartes says, 'there is no convincing argument for supposing that there is something in the fire which resembles the heat, any more than for supposing that there is something that resembles the pain. There is simply reason to suppose that there is something in the fire, whatever it may eventually turn out to be, which produces in us feelings of heat or pain'(ibid, p.118).

Having declined by this his initial doubts about the reality of the external objects, Descartes also rules out his assumptions about the impossibility of distinguishing between dreams and reality. Although images that we have in our dreams can reach the same degree of clarity and distinctiveness that the images we have in our vigilant state, our thoughts and reasoning in our dreams can never catch up with what they are in our vigilant state; besides, dream images are casual and unconnected among themselves and with the rest of our personal experience in contrast to images

as they are in reality.

Ever since Descartes' major philosophical works were published, his views have been subjected to serious criticism, as well as to an appreciation. From the most known critical reviews those by Kant (1965) and Husserl (1977) can be mentioned; for the more recent studies see Versfeld (1946), Smith (1966), Kenny (1968), Rée (1974), Voss (1993). In a large number of studies nearly all aspects of Descartes' metaphysics were questioned. Although some of the objections will later be discussed in appropriate dialogues, basically it is not the aim of this manuscript to give a philosophical assessment of Descartes' views in the light of these studies, especially under the angle of these views 'rightness' or 'wrongness'. As it has been mentioned before, for metaphysical problems the criterion 'right' and 'wrong' in their strict logical sense is irrelevant, as the very idea of true knowledge has its roots in metaphysical notions and judging these notions on their 'true' or 'false' nature would include a vicious circle.

Instead, metaphysical problems (such as the dualism between body and mind, the ontological proof of the existence of the Supreme Being, the relationships between external objects and their mental images, the metaphysical criterion of truth) are open to various, even alternative, interpretations, and this is that very 'openness' of the metaphysical problems to interpretations that allows for the pluralism of philosophical views, and, in the end, for the diversity of conscious life on this planet. The aim of this particular study was to assess how and when European children of various ages come to the appreciation of one particular way of solving fundamental metaphysical puzzles, that is, Descartes' way, selected by the author of this book on the grounds discussed above. In no way can this prevent or stop anybody from investigating the developing children's views on the basis of other metaphysical systems, like those offered, for instance, by Plato, Hume or Kant.

Chapter 2. CHILDREN AND CARTESIAN METAPHYSICS. AN EXPERIMENTAL STUDY OF CHILDREN'S METAPHYSICAL REASONINGS.

According to the distinguished steps in Descartes' discourse seven dialogues were created in which problems raised by Descartes were put to children aged from 4 to 14 years in a form accessible for them (see Picture 1). Along with key questions in which the problems under question were put directly, there were also

additional questions whose function was to 'warm up' the child and to 'keep the interrogation going.' If the child's answer was not clear, he or she was asked additional auxiliary questions after which the key question was repeated again. The dialogues were tape recorded.

DESCARTES

Child Dialogues	Descartes' Steps
Dialogue 1. Introduction	Step 1. Introduction
Dialogue 2. Objects' shapes and the existence of the external world	Step 2. Everything I know can be doubted
Dialogue 3. Personal existence of the child	Step 3. The only true knowledge is "cogito ergo sum"
Dialogue 4. The distinction between body and mind	Step 4. Body and mind are totally different one from the other yet linked to each other
Dialogue 5. The criterion of truth	Step 5. Truth is everything, which is as clear as "cogito ergo sum"
Dialogue 6. The existence of the almighty wizard	Step 6. If I have an idea of the Supreme Subject, then the Subject must really exist
Dialogue 7. The relationships between sensations and physical objects. The distinction between dreams and reality	Step 7. Sensations and images of objects belong to the subject's mind and not to the objects that produced them

FIG. 1. The stages of Descartes' meditation and dialogues with children.

A general aim of the study was to determine to what extent
children of various ages were able to produce answers approaching

(or deviating from) answers given by Descartes. On the basis of
the analysis of children's answers and justifications I intended
to establish in what age and in what form children begin to
realize the classical metaphysical problems and what kinds of
solutions for these problems they were able to find.

　　　95 children participated as subjects in the original study˙
conducted in Moscow: 4-year-olds (with the mean age 4 years 6
months), 5-year-olds (mean age 5.4) and 6-year-olds (m.a. 6.8)
were recruited from kindergartens in Moscow (15 children in every
age group), and 7-year-olds (m.a. 7.4), 9-year-olds (m.a. 9.2), 11-
year-olds (m.a. 11.5) and 13- and 14-year-olds (m.a.13.10) were
attending 1st, 3rd, 5th and 7th grades of Moscow schools,
accordingly (15 children in each of two junior age groups and 10
children in each of two senior age). There were approximately equal numbers of males
and females in each age group.

　　　After a brief warm up session during which the experimenter
visited a kindergarten group or a classroom and talked with a
teacher and the children for a while, children were invited
individually in a separate room and asked the questions. All seven
dialogues were conducted in one session in a constant succession
from Dialogue 1 to Dialogue 7.
The answers given by the children were then classified and presented in a descriptive
form (the name of the class and examples of children's judgements or justifications) and
in the form of pictures. As some of the children failed to produce answers to certain
questions and some of the answers were impossible to interpret, it is not always that a
total number of answers to a certain question given by a certain age group comes up to
100%.

　　　To provide a cross-cultural comparison between
judgements of Russian and British children, dialogues 1, 4, 6 and 7
of this chapter were replicated in Lancaster (UK). For the
comparative study in Britain most children were taken from
suburban primary and secondary schools. The comparisons were made
between Russian and British children of the same ages (like
4, 5, 6, 7, 9, 13 and 14-year-olds), although, due to˙
differences between Russian and British educational systems, the
children from both samples may have had different experiences. For
instance, in Russia most children before 7 attend a kindergarten --
an institution where they spent most of the day and are
systematically engaged in play and learning activities. In
Britain, children of 4 and 5 visit playgroups and primary schools
in which, according to my observations, the element of directive
scientific teaching is made a lesser stress on that it is in
Russian kindergartens.

　　　However, starting from 7 years on, these differences smooth
away and children from both cultural groups are involved in
compulsory teaching to an approximately equal extent, with most

disciplines (like math, physics, history, language, literature) being common to both school curriculums (at least as far as it concerns comprehensive schools in Britain), although the way the disciplines are taught seem to be slightly different, with British teaching being of more 'exploratory' type and Russian teaching being predominantly of 'instructive' type. Also, the differentiation between various scientific disciplines (like physics, chemistry, biology, geography) in Russia seem to be stronger observed in teaching routine, whereas in Britain some various subjects may go under the same title of 'science'.

Yet, as it has been stated in the Introduction, metaphysical problems are of such general nature that the differences in education mentioned above are unlikely to significantly affect children's answers: rather, it is the child's age (that is, the time the child had the opportunity to accumulate metaphysical˙ experience and develop his or her metaphysical intuitions) that is of major importance here. It is on this ground that identical age groups (and not groups of children selected on the basis of their IQ's or other cognitive tests) were chosen for the cross-cultural comparisons.

In the replication study which involved dialogues 1, 3, 6 and 7, ninety-five children participated as subjects: 4-year-olds (m. a. 4.5), 5-year-olds (m. a. 5.5), 6-year-olds (m.a. 6.6), 9-year-olds (m.a. 9.3), 11-year-olds (m.a.11.9) and 13-14-year-olds (m.a.13.11) with 15 children in each age group with approximately equal numbers of males and females. The study was done by Nikki Ratcliff in her BSc research project (see Ratcliff, N., 1994).

Parts of Dialogue 4 were reproduced with ten 4-5-year-olds, twenty 7-9-year- olds, twenty 11-13-year-olds and twelve adults, all groups having equal numbers of males and females. The study was done by Sharon Bland in her BSc research project (see Bland, S.,1994).

There were also two analytical studies conducted on the basis of Dialogues 6 and 7. The study on the basis of Dialogue 6 involved 28 men (m.a.21.1) and 34 women (m.a.20.1), and the study on the basis of Dialogue 7 involved thirty-two 6-year-olds (m.a. 6.5), thirty-two 9-year-olds (m.a. 9.5), thirty-one men (m.a. 23.0) and thirty-one women (m.a. 21.4).

Dialogue 1. The introduction

The major objectives of this dialogue were to introduce children to the discussion , to give them a hint that knowledge they get from adults can be put under doubt and to determine whether they could understand the word 'existence' properly and relate the word correctly to various objects some of which are

available in their immediate perceptual field (the table), others
are real but not available in the immediate perceptual field (an
elephant, a hippopotamus), still others are not real (an
elepotamus, a centaur). The last objective of the questions was
to draw children's attention to the fact of their own existence.
The questions were as follows:

1. Tell me please, do you know much about the world? Do you know the names of the objects that surrounds us? Can you tell me what 'the world' is? Can you tell me what 'man' is?
2. And whom did you learn all this from? Did you learn this
from adults? Do you always agree with what adults say? In what
cases do you disagree?
3. Do you agree that this table exists or do you think that
it doesn't exist? Why do you think so?
4. And an elephant does it exist or not? And a hippopotamus -
does it exist or not?
5. And an elepotamus does it exist or not? And this
creature (a picture of a centaur is shown) does it exist or not?
6. And yourself do you exist or not? Why do you think so?˙

Where it concerns the results of the original study in Russia in the text or in figures' headings, the subjects will be addressed to simply as 'subjects', 'children', 'schoolchildren' or 'preschoolers'. Where the results of the replication study in Britain are presented, subjects will be addressed to as 'British children', 'British adults', 'British subjects' or 'adults' (as there were no adult subjects involved in the Russian study).
It is only average numbers of children's answers to key questions that are presented in figures, the rest of the questions of the dialogues having either the function of preparing the child for the key question or of repetition of the key question in a different form. The numbers of key questions are named in the figures' headings, and the children's answers to some of the non-key questions are analyzed in the text.

For the convenience, since now on the between age groups differences will be
referred to as 'increase (decrease), x years to y years, $\chi2=$____, p<.___)', the comparisons
being by chi-square test with continuity correction.

The results (see Fig.2) showed that about half of the preschoolers (that is of 4-, 5- and 6-year-olds) had difficulties in giving a definition of 'man' and 'the world.'
Some of them gave tautological answers ('man is man', 'man is people', etc.),
however, the number of sensible answers increased significantly
among 7-year-ods in comparison to 6-year-olds ($\chi2=6.80$, p<.01
with regard to the definition of 'man', $\chi2=8.35$, p<.003 with regard
to the definition of what 'the world' is),

For most 6-year-olds

'the world' was a synonym of a certain 'container' ('the world is Earth', 'a country', 'a street'). Some of the children defined 'man' in a transductive way pointing out certain attributes of a human individual ('man is who walks along the streets', 'who can breath with air', 'who has hands, and legs', 'it is a kind of living creature'); they were unable, however, to identify essential features of 'man'. Older children used to describe 'the world' in a less 'spatial' terms ('this is nature', ' this is' plants, houses, people', this is what surrounds us', etc.), and many of them were capable of identifying essential characteristics of 'man' ('man is an intelligent animal', 'this is a creature who can do almost everything, and the cleverest in the world'). Among other typical features that distinguished 'man' from other living beings the following were mentioned: labor, language, intelligence, voluntary behavior ('man is a sort of an automat who can control its own actions).

Tautological answer: the world —o—, man —o—
Sensible answer: the world - -o- -, man - -o- -

FIG. 2. Percentages of children producing answers in response to Question 1 regarding the concepts "the world" and "man". (gr. = grade).
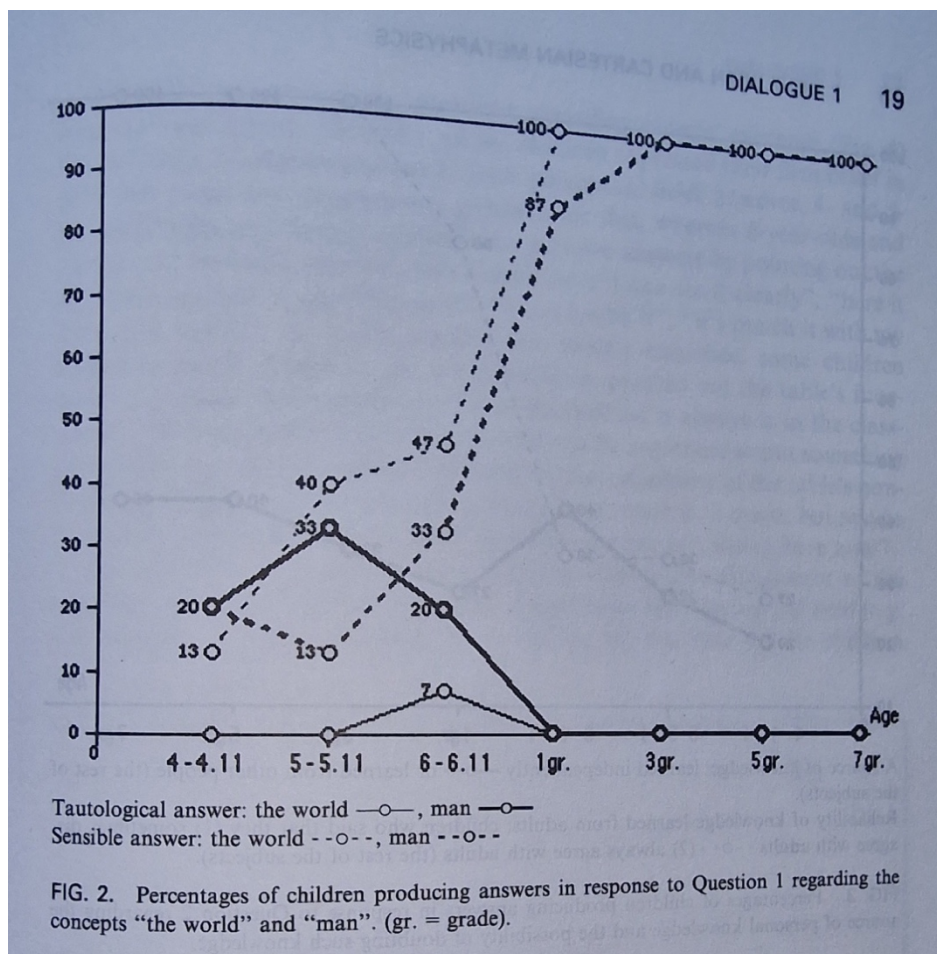
In response to the questions about a source of their knowledge (Fig.3) part of the children (20 to 40 percent) stated that they had learned everything on their own without help (i.e.,

from books), others acknowledged that adults (peers) had contributed to their knowledge. Among preschoolers the majority (around 70 percent) said that they always agreed with adults and those who acknowledged occasional disagreements the latter were evoked not by the children's doubts in adults' competence but rather by the children's caprices and whims ('I disagree when they don't do what I want'). Among schoolchildren the overwhelming majority acknowledged that in many cases they would disagree with adults and the reasons given were mostly objective ('I disagree when they think differently from what I think', 'when they deceive me', 'when they make fun of me'). Many children pointed out that˙ in some cases, adults judgements contradict each other and are incoherent ('I read something in the book, and they say this isn't true', 'they write one thing in one book and other things in a different book about the same subject', 'a teacher says a certain thing about something and my parents say it's not true", etc.). The number of children capable of putting under doubt opinions of their parents, teachers, authors of the books, etc. grew significantly with age (increase, 6 years to 7 years/1gr., $\chi 2=4.88$, $p<.02$).

A source of knowledge: learned independently —o— or learned from other people (the rest of the subjects).
Reliability of knowledge learned from adults: children who said that they (1) sometimes disagree with adults - -o- - (2) always agree with adults (the rest of the subjects).

FIG. 3. Percentages of children producing answers in response to Question 2 regarding the source of personal knowledge and the possibility of doubting such knowledge.

Children's answers to the questions about objects' existence (Fig.4) were the least varied. Naturally, all the subjects

expressed their firm belief in existence of the object that was
present in their perceptual field, however, 4- and 5-year-olds
didn't produce any grounds for this, whereas 6-year-olds and
schoolchildren grounded their positive answers by pointing out to
the clarity and distinctiveness of their sensations ('I can see it
clearly', 'here it is', 'the recorder is standing on it', 'I can
touch it', if I punch it with my wrist it'll crack down', etc.).
To confirm the table's existence some children used to kick it,
shake it, strike it, etc. Other children pointed out the table's
functions as a proof of its existence ('it exists, because it
always is in the classroom', 'if tables didn't exist, there would
not be anywhere to put something on'). Only one 13-year-old boy
allowed for the possibility of the table's nonexistence: 'There˙
can be everything. Here I can touch it, it exists, but maybe it
doesn't, maybe there is not the table and even we are not sitting
here now'.

Children who were confident in the existence of an object that (1) was actually present in their perceptual field (q.3, —o—), (2) was real but absent in their perceptual field (q.4, --o--), (3) was an unreal (fantastic) object (q.5, --o--).

FIG. 4. Percentages of children producing answers in response to Questions 3, 4, and 5 regarding objects' existence.
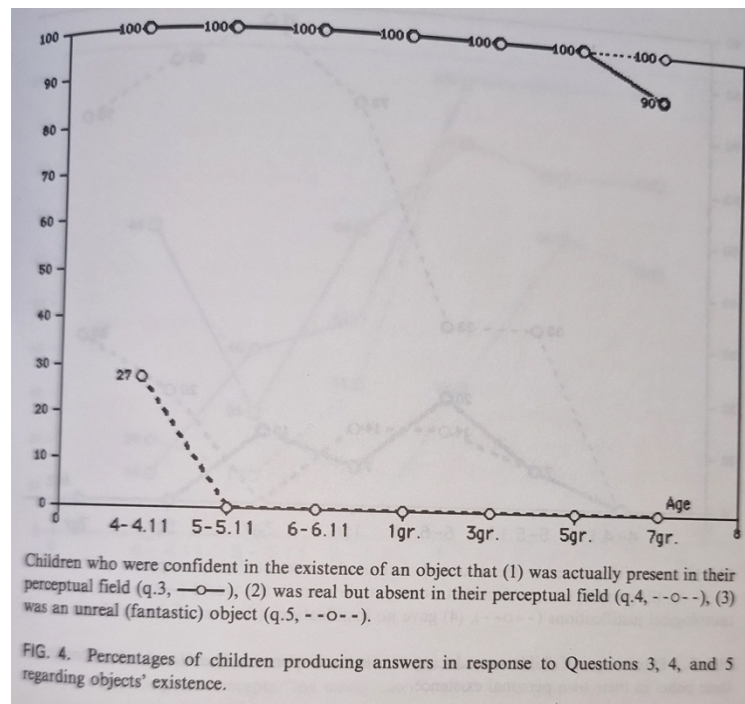
        The children were equally unanimous in their acknowledgement
of the existence of objects that were real but absent in their
perceptual field (an elephant, a hippopotamus). By contrast,
nearly all subjects but four denied the possibility of the
centaurs' existence ('there can be no such creatures') with older
children making their negative answers more precise by adding that
the centaur didn't exist in reality, but they did exist 'in
legends', 'in myths', 'in fairy tales', 'in pictures', etc.('it is
from the Greeks mythology', 'it is a fairy tale character', 'this
all was created by Greeks, they had myths, they believed in all

this'). Lastly, part of the children stated that at present there were no such creatures but they existed a long time ago ('it existed in other centuries', 'it is from ancient times').

Quite naturally, there were no children who would put their own personal existence under doubt. However, if the youngest subjects (4 years of age) merely confirmed the fact of their personal existence ('I am', 'I exist'), the older children tried to support their judgements by giving some sort of justifications (Fig.5). Part of them simply pointed out at the fact that they could perceive themselves ('I am, because look I am here', 'because I can see myself', 'because I can walk', 'because I can˙ feel and touch myself') (increase, 6 years to 11 years/3gr., $\chi 2=6.80$, $p<.01$), others saw the proof of their personal existence in the fact of other people's existence ('everybody can see me, and if I didn't exist, nobody would be able to see me and hear me', 'I always talk with my mum', 'I am called, I am addressed to', 'If I didn't exist there would be nobody for you to talk to now'), still others gave tautological reasons ('I exist because I am living', 'because I was born'). Notably, the overwhelming majority of the children produced grounds of the first type seeing the proof of their personal existence in the clarity of their self-perceptions (I am because I can move, jump, run, learn, do something, touch myself, see myself, feel myself, hear myself, etc.)

Children who (1) referred to the clear and obvious character of their perceptions of themselves (- -o- -), (2) pointed out the fact that other people exist in the world (—o—), (3) produced tautological justifications (- -o- -), (4) gave no justifications (the rest of the children).

FIG. 5. Percentages of children producing answers in response to Question 6, which confirmed their belief in their own personal existence.

In the comparative study in Britain, British children produced definitions of the terms 'the world' and 'man' similar to those given by Russian children, with the only difference that some British children (but no Russian children) gave a Christian definition of man ('man is a person created by God from his own image'). As it can be seen from Fig.6, there were no significant differences between numbers of logically sensible answers given by Russian and British children, apart from that Russian 9-year-olds gave grounded definition of 'man' more often than British 9-year-olds ($\chi2=8.5$, $p<.004$), whereas British 4-year-olds performed better in the definition of 'the world' ($\chi2=6.8$, $p<.01$)

FIG. 6. Percentages of Russian and British children producing sensible answers in response to Question 1 regarding the concepts "the world" and "man".
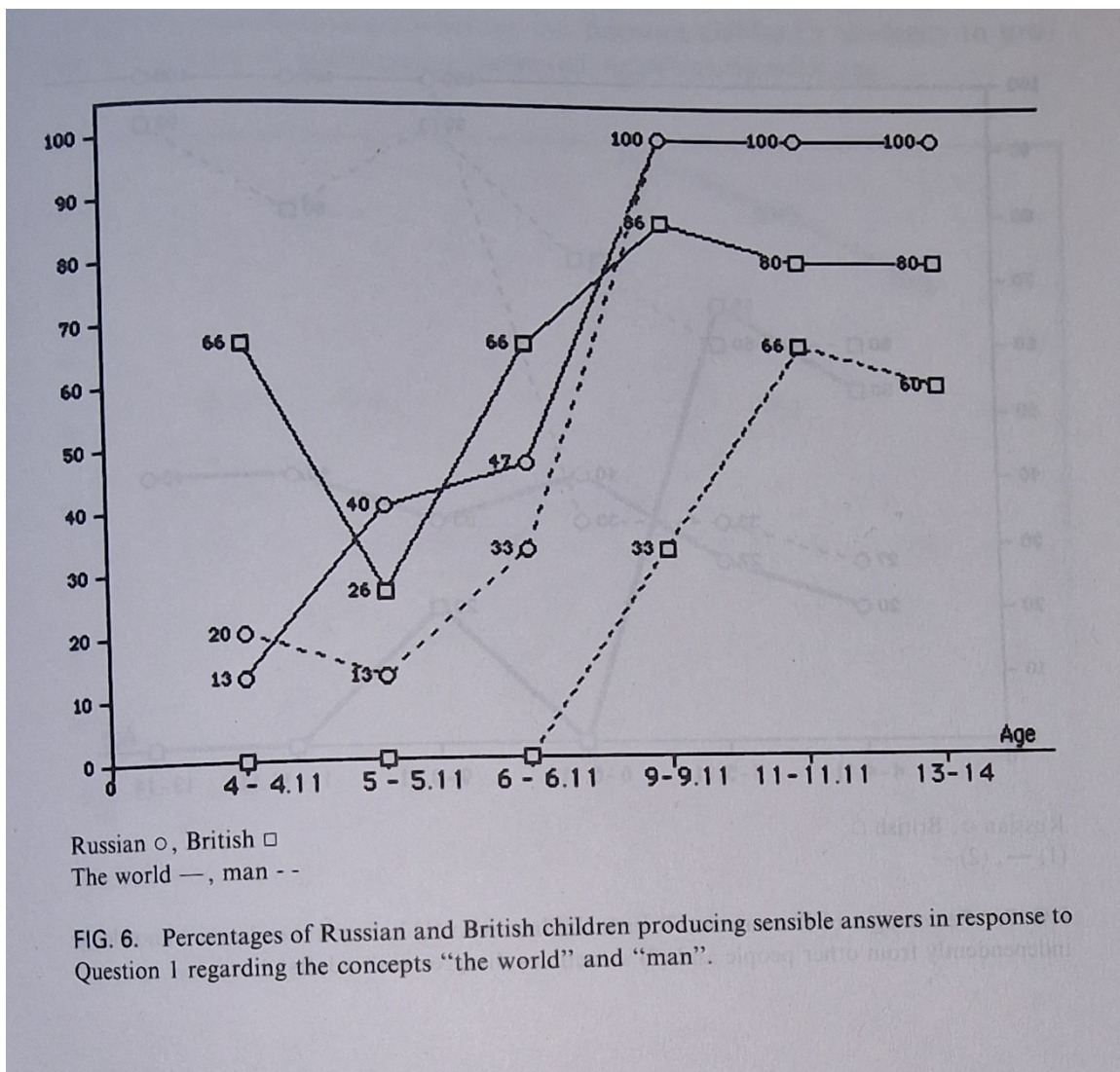
With regard to the sources of knowledge, there were
substantial differences found between judgements of Russian and
British children, namely, British 6-, 11- and 13-14-year-olds were
less inclined to attribute their knowledge exclusively to
themselves than were their Russian peers ($\chi2=6.54$, p<.02), whereas
British 6-year-olds more often acknowledged that they sometimes
disagree with adults than did Russian 6-year-olds ($\chi2=9.2$, p<.003) (Fig. 7). There was a major shift observed in British 6-year-olds in the realization of the external origins of their knowledge (decrease from 66% of 5-year-olds denying that their
knowledge was acquired from other people to 0% of this kind of
answers among 6-year-olds).

Russian ○, British □
(1) —, (2) - -

FIG. 7. Percentages of Russian and British children who (1) believed they learned knowledge independently from other people and (2) sometimes disagree with adults.
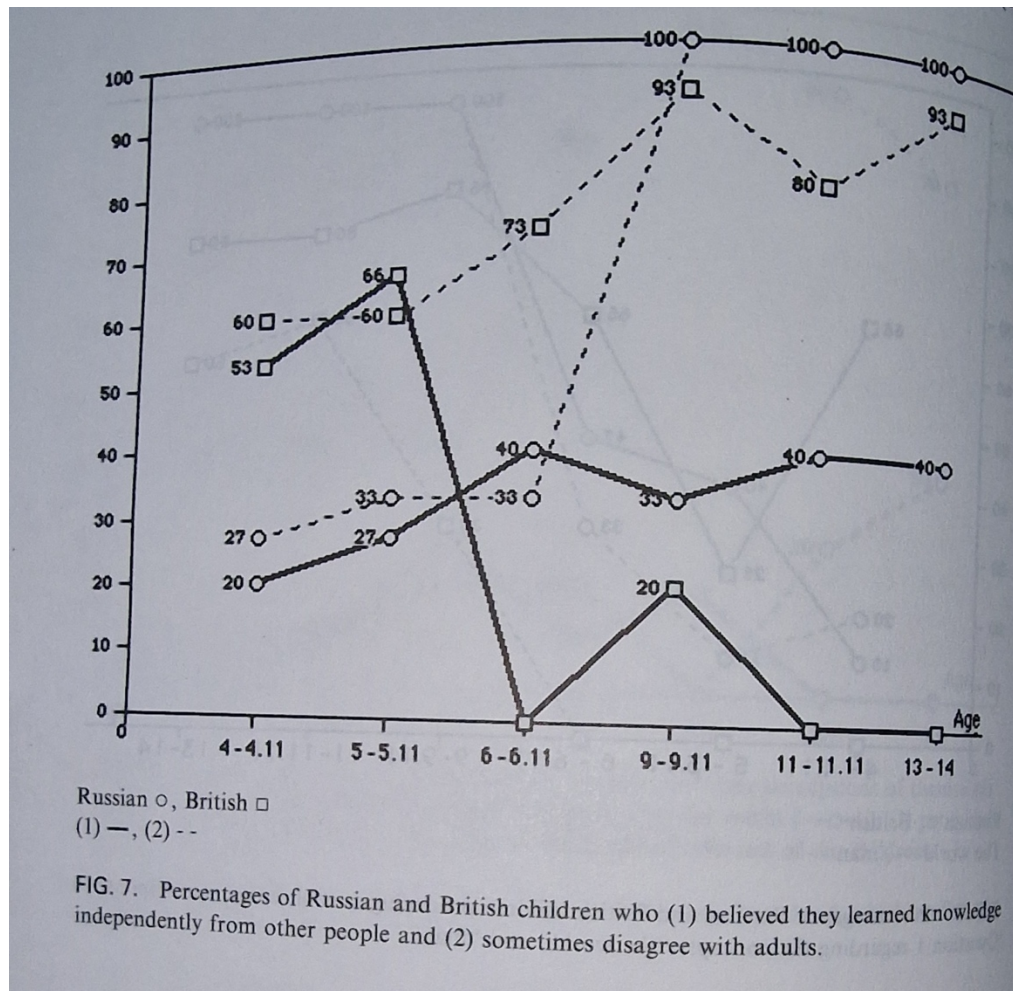
Combined with the growing realization of their occasional disagreements with adults, this shift in 6-year-oldscan be attributed to the beginning of intensive schooling the assumption that finds its support in the fact that similar divergence in Russian children occurs a year later, (i.e., at 7 years), which is the year when Russian children normally go to school (see Fig. 2). Yet a significant (although moderate) number of Russian senior schoolchildren retained the illusion of the 'independently acquired knowledge', whereas among British schoolchildren older than 6 this kind of answers practically disappears the result' that challenges further and more detailed comparative analysis of the characteristics of British and Russian educational systems.

Questions about the existential status (of objects actually present in the perceptual field, real objects which were absent in the immediate perceptual field and fantastic objects) yielded in British children's answers that did not differ from those given by Russian children (see Fig. 4). With regard to the justifications of their belief in their own

FIG. 8. Percentages of Russian and British children who justified their existence by referring to the clear and obvious nature of their subjective experiences.
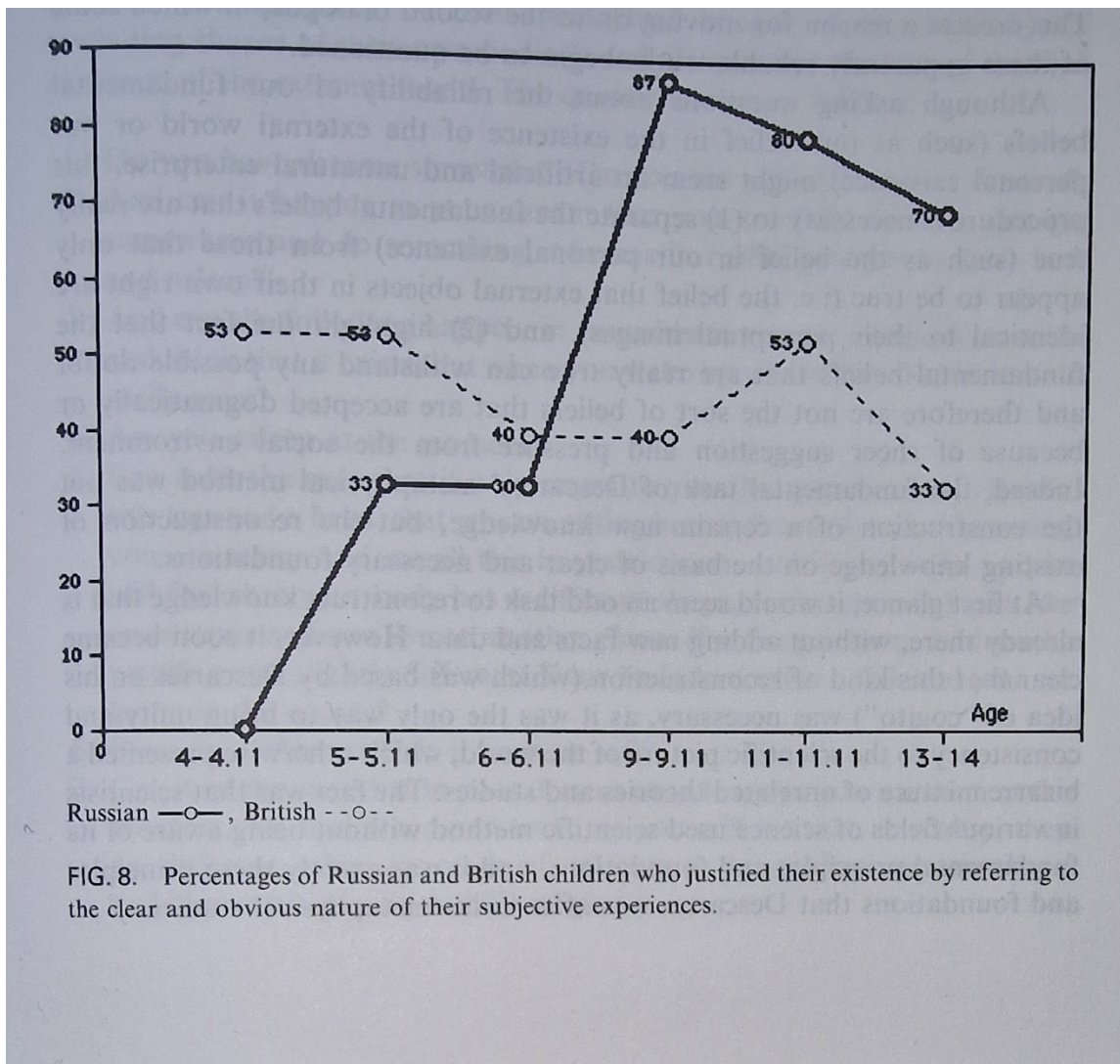
personal existence, British children produced the same kinds of judgements as did Russian children, with the only age difference that concerned the argument 'clearness of subjective manifestations': as it can be seen from Fig.8, British 4-year-olds produced a significantly larger number ($\chi2=8.4$, $p<.004$), and British 9-year-oldsa smaller number ($\chi2=4.3$, $p<.04$) of this kind of justifications then did their Russian peers.

Basically, British children revealed no age dynamics in their reliance on the clearness of their subjective manifestations whereas Russian children significantly increased with age their tendency to produce this kind of justifications.

A few points should be stressed about the data. Firstly, the results showed that major shifts in children's judgements occur

at the edge between preschool and school ages. It is the primary schoolchildren who started to give sensible and essential characteristics to the notions 'man' and 'the world'. It is at this age that most children made stress on their capacity to assess critically the knowledge that they had received from other people. Secondly, although at the school age most children were quick to admit that other people's opinions could be wrong, they, nevertheless, were not dubious concerning their own personal existence which most of them tried to prove in the same way that they used to prove the existence of a table by merely referring to the fact of perceiving themselves.

Basically, the results allow one to suggest that older preschoolers and primary school children are at the stage which is very similar to that from which Descartes started his journey in 'the deep of doubt'. On the one hand, the children lose their original naivete and start being able to put some kind of knowledge under doubt. On the other hand, quite naturally, this critical capacity does not extend beyond a certain circle of knowledge leaving the vast areas of knowledge (such as the knowledge of the existence of external objects, of the personal existence, etc.) in the realm of facts that would be odd to put under doubt. This creates reasons for passing up to the second dialogue in which some of these apparently reliable truths would be put under doubt.

Although asking questions about reliability of our fundamental beliefs (such as the belief in the existence of the˙ external world or our personal existence) might seem an artificial and unnatural enterprise, this procedure is necessary in order to (1)separate the fundamental beliefs which are really true (such as the belief in our personal existence) from those which only appear to be true (i.e., the belief that external objects in their own right are identical to their perceptual images), and (2) highlight the fact that the fundamental beliefs that are really true can withstand any possible doubt and therefore are not the kind of beliefs which are accepted dogmatically or because of sheer suggestion and pressure from social environment.

Indeed, the fundamental task of the Descartes' metaphysical method was not a construction of a certain new knowledge, but, rather, a reconstruction of the already existing knowledge on the basis of clear and necessary foundations.

At the first glance, it seemed an idle and odd task to reconstruct knowledge that was already here, without adding some kind of new facts and data to it. However, it soon became clear that this kind of reconstruction (which was based by Descartes on his idea of 'cogito') was necessary as it was the only way to bring unity and consistency into the scientific picture of the

world which otherwise presented a bizarre mixture of unrelated theories and studies. The fact was that scientists in various areas of science used scientific method without being aware of its fundamental principles and foundations, and it was exactly these principles and foundations that Descartes was after in his metaphysical studies.

An example from an everyday life can be helpful here. Most of educated people in contemporary industrial societies can be users of sophisticated hi-tech equipment (like computers, CD players, and others) without having any idea about the constructive principles and the essential 'mechanics' of the hardware they use, and it works until a certain moment, namely, when the device breaks down. At this point the user has to address a specialist who is in a possession of knowledge about the principles on which the work of the hardware is based. It was this work of finding out what makes all rationally constructed theories (like those of cosmology or physics) seem to be true that the Descartes' metaphysical reconstruction did.

Dialogue 2. Discussing the possibility of putting under doubt the adequacy of the perceptive images of objects and the existence of the external world.

In accordance with the Descartes' argumentation, this dialogue tested to what extent children were able (1) to acknowledge the absence of an absolute borderline between the two states of mind vigilant state and dreaming, (2) to put under doubt the adequacy of their perceptual images of physical objects (including shapes of their own bodies), and (3) to put under doubt the fact of the real existence of the external world.
The questions were as follows.

1. Do you have dreams sometimes? Do you see yourself in your dreams?
2. And can this happen that in your dream you are fully dressed, you go somewhere and do something, whereas in reality you are in your bed and asleep?
3. And can the following thing happen: in your dream you see a certain creature and think that it exists, but when you wake up you realize that it doesn't really exist?
4. Are you asleep at the moment?
5. Can this be the case that it only seems to you that you have two hands, two legs and a head, that you are sitting here in front of me but in reality you are asleep and see all this in your dream, and if you wake up you will find that your body has a

different shape, for instance it looks like an octopus and you live on another planet (for youngest children the wording was slightly different: Your body looks like a fish and you are living in the ocean)?

     6. Does this table exist? Is it hard or soft?

     7. But can the following be the case that this only seems to you in your dream that the objects are such as you see them at the moment, but when you wake up you will see that in reality they are different: tables are made of soft cotton, the Sun has a square shape and this room is a big bubble of glass?

     8. And can the following thing occur that in your dream you see a certain object which in reality doesn't exist, for instance, you have a dream about a dragon, and dragons don't exist in reality?

     9. And can this be the case that all these objects the˙ table, the Sun and the whole world they are only in your dream as was the dragon, but in reality they all don't exist?

     10. I'd like to propose an interesting game. Its name is 'Unusual dream.' In this game we agree that we are in a dream and all this this Sun, this table, and this world they are part of the dream, but in reality they don't exist. Can we play such a game or can we not?

     As it can be seen from the questions, they were designed to put under doubt certain children's beliefs that they used to view as absolutely doubtless, namely the beliefs that external objects (including their own bodies) are as they seem they are and that the outer world exists. To achieve this the Descartes' tactics of 'shifting' the spheres of reality was used: according to the tactics, as everything we can see in reality can look different in dreams and there is not an absolute borderline between the two, therefore, it is possible that all the objects have different shapes from those we think they have. Although it doesn't follow from this that there is a possibility for the external world of any sort to be non-existing, the questions about this possibility (q.9 and q.10) have yet been asked just in order to make sure the children can understand that it is not possible to discuss the total absence of the outer world.

     A deviation from the standard procedure was inserted here in that after asking q.5 and q.10 and registering the child's answer the experimenter produced one or two objections in order to examine how stable the child's beliefs in the invariability of the objects' shapes and external world's unconditional existence were.

     All the children acknowledged that they do have dreams sometimes. They also acknowledged that occasionally they could see

themselves in the dreams as well as the creatures that don't exist in reality and confirmed that at the moment of conversation they were in a vigilant state.

Having been asked q.5 (suggesting that their bodies, perhaps, have different shapes from that they thought they have) the children were puzzled. As a result, most of the preschoolers and 1- st graders refuted the possibility (Fig.9). Some stopped at that, others gave tautological grounds ('This can't be the case because I am not an octopus', 'This can't be true because I am not in a dream at the moment') or produced transductive justifications ('A fish can swim, and I cannot, therefore, I am not a fish'). Many children, however, offered various sensible justifications in favor of their negative answers (increase, 4 years to 6 years, $\chi 2$ =4.26, p<.03): some of them suggested that an alien creature (a fish, an extraterrestrial creature) cannot see a human being in its dreams because it doesn't know anything about humans ('A fish can only see fish in its dreams', 'Inhabitants of other planets cannot live on Earth, how can they know that there are living creatures here?'), others grounded their negations by claiming that such a long and strange dream was impossible ('There can't be something like that, I would have wakened up a long time ago'), still others referred to the clear and distinct character of their perceptions which they saw as an indication that the perceptions were real ('I wouldn't be able to see everything so clearly in a dream'). The experimenter's counter arguments seemed to have no impact on children's opinions. In contrast, about 30 percent of 6- and 7-year-olds and the majority of 9- to 13-year-olds acknowledged that shapes of their bodies in fact could be different (increase, 5 years to 13 years/7gr., $\chi 2$ =12.34, p<.001). At the beginning these children too answered in the negative, however, unlike younger children, they would change their minds after the experimenter put forward his considerations in favor of the hypothesis. Here are two examples.

Nikita (a boy, 9 years/3gr.)
- No, I am not a creature from another planet because they cannot be asleep for so long 9 years, and see such a long dream that me is me.
- How do you know? Maybe they live for 100 000 years and have nights for 60 years each.
- Well, I don't know, perhaps this may happen, but I yet slightly disagree. Because if I were an extraterrestrial creature how would I be able to have a dream about this planet and not about some other one?
- Well, it's difficult to say why people see exactly this in their dreams and not something else. So, can this happen or not?

- This can happen, of course.

Andrej (a boy, 11 years/5gr.)
- No, this cannot be the case, because alien creatures are not˙
yet known to our scientists that they exist, therefore I cannot be
an alien creature.
- But is there a certain probability that they exist, or there
is not?
- Yes, there is.
- So, can this be the case that some alien creature gets
asleep and sees in its dream that it is yourself?
- This can happen, but I am not an alien creature.
- So, there is no probability whatsoever that your body has a
different shape in reality, is there?
- Well, there is some probability.

Children who allowed for the possibility that their bodies could in fact have a different shape
(—o—).
Children who denied that this was possible and (1) gave no grounds or produced tautological
and transductive justifications (- -o- -), (2) reasoned that an alien creature cannot see a human
being in its dreams (- -o- -), (3) said that what they were seeing was not a dream because
dreams could not last for so long (—□—), (4) said that what they were seeing could not
possibly be a dream because of the clarity and obviousness of their experiences (—o—).

FIG. 9. Percentages of children producing answers in response to Question 5 regarding the
possibility of their bodies having a shape different from that which it appeared to have.

The children responded to q.6 and q.7 in a similar fashion (Fig.10). Most of the preschoolers and schoolchildren emphatically denied that external objects could have other shapes from those they seem to have. Some of the children gave tautological grounds ('A table cannot be soft, because it is hard'), others appealed to the impossibility to have such a long dream, still others referred to the clarity and distinctiveness of their perceptions ('I could not see and feel everything so clearly in a dream, this is all real'). Lastly, a few children pointed out to the fact that each object has its own functions, and this determines the object's shape ('This cannot be the case; you can't eat on the table if it is made of down'). And yet some 9-year-oldsand most 11and 13-year-olds finally agreed that objects could indeed have different shapes (increase, 7 years/1gr to 11 years/5gr, $\chi 2 = 6.02$, $p < .02$). Here are two examples.

Sasha (a boy, 9 years/3gr.)

     - I think objects cannot be different. What kind of a table it would be if it were made from down? It would be soft, you can't write on it, and this recorder could not rest on down.

     - But may be in the real world there is no need to write and there are no recorders?

     - And what are tables for then?

     - I don't know. So, can this be the case, or the is no probability of this at all?

     - Well, there is some probability but very small one.

Dima (a boy, 11 years/5gr.)

     - No, this cannot be true because if tables were made of down you won't be able to put anything on them, they would collapse.

     - But in that real world even gravity may be absent and nothing would collapse?

     - Well, there is some small probability of this, but it is not very likely.

Children who acknowledged that physical objects could in fact have shapes different from those they appear to have (—o—).
Children who denied that this was possible and (1) gave no grounds or produced tautological and transductive justifications (- -o- -), (2) said that what they were perceiving could not possibly be a dream because of the clarity and obviousness of their experiences (--o--), (3) said that what they were perceiving could not be a dream because dreams could not last for so long (—□—), (4) named various functions of objects as the determinants of the objects' shapes (—o—).

FIG. 10.   Percentages of children producing answers in response to Question 7 regarding the possibility of physical objects having a shape different from that which they appear to have.

The children were, however, less lenient when asked about the possibility to doubt the existence of the external world (q.9 and q.10). Only a few preschoolers and one 7 years old child acknowledged the possibility, with the overwhelming majority firmly denying this (Fig.11).

Children who acknowledged that it was possible to doubt the existence of the external world
(—o—).
Children who denied that this was possible and (1) gave no grounds or produced tautological
and transductive justifications (- -o- -), (2) said that what they were perceiving could not
possibly be a dream because of the clarity and obviousness of their experiences (- -o- -), (3) said
that what they were perceiving was not a dream because dreams could not last for so long (—
□—), (4) pointed out that there would be no people if the world did not exist (—o—).

FIG. 11. Percentages of children producing answers in response to Question 9 regarding the
possibility of doubting the existence of the external world.

At that, most preschoolers were
unable to provide grounds for their negative answers; among the
arguments given by the rest of the children four types can be
distinguished. The first three types of arguments were given by
small numbers of subjects: they were tautological arguments ('the
world exists because all this is real and really exists'),
appellations to the clear and distinct character of perceptions
('the world exists because I can feel all this clearly', 'Here
cars are passing by, and birds are flying, I could not see all
this in a dream that clearly', 'I can see that the table is hard,
it is made of timber and the walls are made from bricks') and
stating the impossibility of having such a long dream. Most of the
subjects went for the fourth type of argument in which they
declared the impossibility of their own existence in a nonexistent
world ('The world exists because we have to live somewhere', 'If
there were no Galaxies there would be no planets and I would not
exist either', 'This can't be the case, otherwise where would I be
situated?', 'I yet exist, and how would I be able to exist without
this world?', 'If it were the case, where would I wake up then?')
(increase, 6 years to 11 years/5gr., $\chi2=6.70$, p<.01).

Characteristically, the 'proofs' provided by the experimenter to back the world's nonexistence hypothesis had no effect on the children. Here are two examples.
·

Lena S. (a girl, 11 years/5gr.)
In the course of the dialogue Lena acknowledged the possibility for the objects to have shapes different from what they normally appear to be, but when asked of the possibility for the external world not to exist she replied in the negative. The experimenter expands along the line:

- Well, if objects can be different from what them seem to be, why cannot this be the case that there are no objects at all?
- And where I would be asleep then? No, this can't be the case that there are no objects at all.
- But can you acknowledge at least a tiny probability that this is possible?
- No, I cannot. Where would I be sleeping then?

Roma (a boy, 13 years/7gr.)

During the conversations Roma agreed that there was some possibility for the objects and his own body to have different shapes but he firmly denied the possibility for the world not to exist.

- I don't think this is possible because if there were nothing then I would have no dreams at all and there would be no myself either.
- Do you think that there is yet a very small probability of this to be true?
- No, because...in order for me to exist without the world... no. There is not the slightest probability of that.

Interestingly, a significant number of subjects (about 30· percent of the total sample) denied the possibility of the outer world nonexistence even in play. Most of them argued along the line that it would be impossible to play the game 'without the world' because there would be no place where to play the game. Other children agreed that such a game can be played but they never forgot to mention that such a play would be 'only a fantasy' and not a real thing.

The study with British children showed that, starting from the age of 9 and on, they were significantly more reluctant in acknowledging that their bodies could in fact have shapes different those they seem to have than were their Russian peers (see Fig.12)

FIG. 12.   Percentages of Russian and British children who acknowledged that their bodies may have a shape different from that which they appear to have.
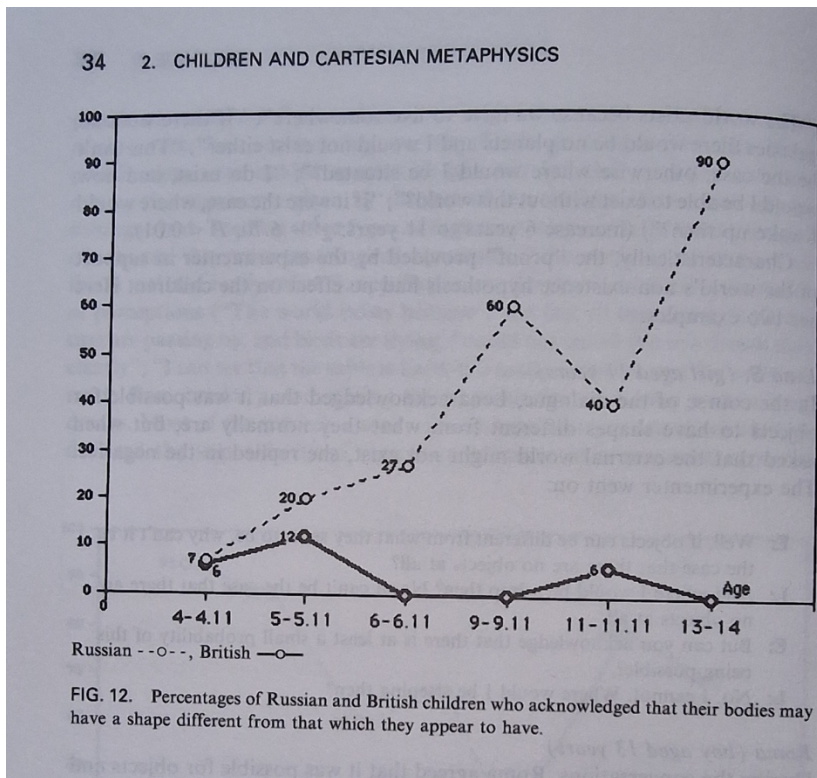
When justifying this, British children gave the whole specter of answers that gave Russian children, however, tautological 'explanations' dominated among them. Similar pattern of answers was received in response to the question about the possibility of doubting the shape of physical objects (see Fig.13). The differences in the results between the answers of British and Russian senior schoolchildren, however, are likely to be the effects of differences in questioning procedures applied in British and Russian studies, as in the Russian study the experimenter employed some arguments against the denial of the possibility of doubt that was almost universal among Russian children when they were asked the question for the first time, whereas in the British study the experimenter simply asked children the question without a subsequent discussion.

FIG. 13. Percentages of Russian and British children who acknowledged that physical objects could in fact have a shape different from that which they appear to have.
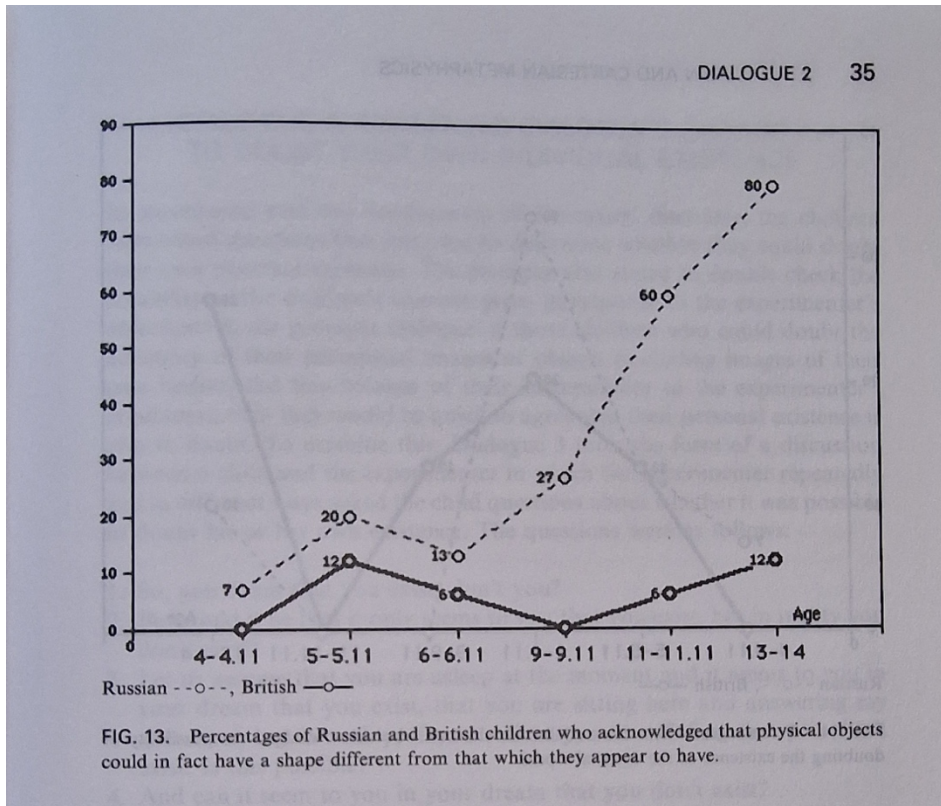
Interestingly, the same differences in questioning procedures did not affect children's answers to the question about the possibility for the external world not to exist the option that was denied by the overwhelming majority of subjects in both cultural samples, no matter whether the denial was or was not challenged by the experimenter (Fig.14)

Russian - -o- -, British —o—

FIG. 14.   Percentages of Russian and British children who acknowledged the possibility of doubting the existence of the external world.
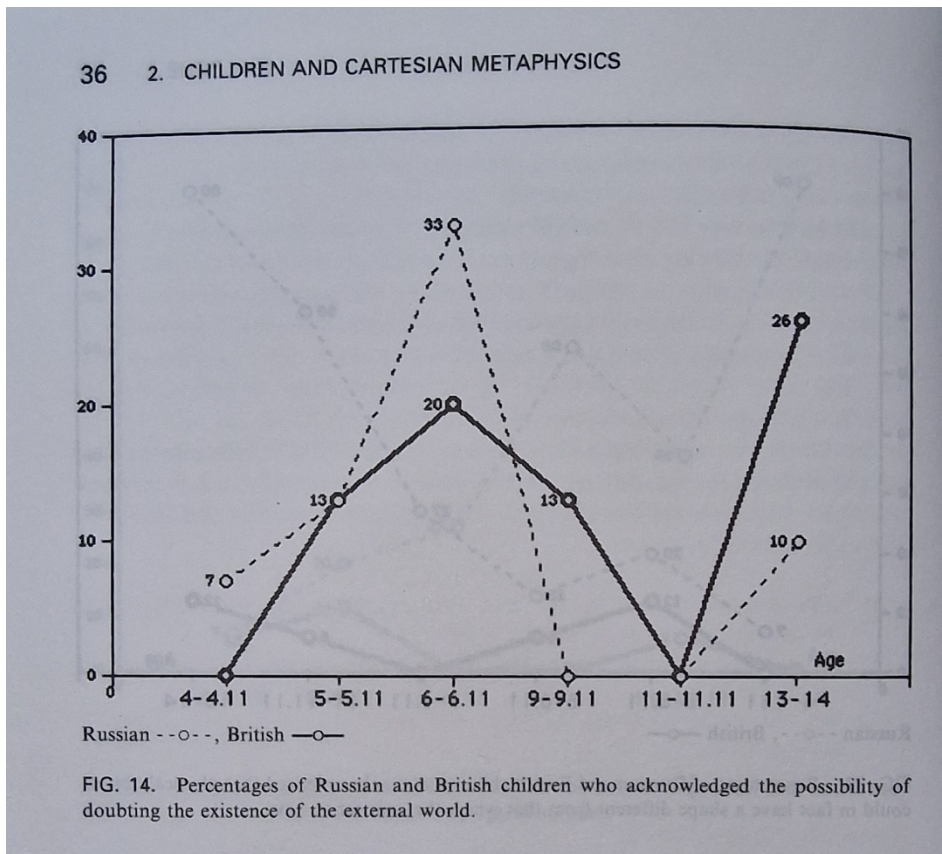
This fact stresses once again the fundamental difference that exists between the beliefs about the appearances of the external objects and the belief in their actual existence: whereas the appearances of the physical objects, however convincing they might seem, yet can be put under doubt, the existence of the external objects (i.e., the existence of the external world) is something˙ that resists any skepticism.

Overall, at the beginning of the dialogue the great majority of the subjects refused to accept the possibility of doubting the relevancy of the perceptual images that they had about their bodies , however, part of them changed their minds in the course of the discussion with the experimenter and agreed that even such extravagant hypothesis had some probability to be true. The number of such children increased significantly among 11-year-oldsin comparison with preschoolers. A similar pattern was found for the answers to the question about the possibility to put under doubt the adequacy of the objects' shapes. In contrast, the absolute majority of the children of all age groups crucially denied the possibility to put the external world's existence under doubt. The reasons given by most children showed that their strong belief in the impossibility for the world not to exist rested on their

belief in their own personal existence ('If there were no the world I would not exist either'). Essentially, answers like this suggest that the children have an intuitive belief in the inseparable unity between subject and object (the external world), i.e., they viewed a subject and the world as two mutually dependent notions each of which is a necessary condition for the existence of its counterpart.

So far, answers of 9- to 13-year-old children seem to show their sensitivity to the first step of Descartes' 'skeptical revolution' (those that proclaimed the possibility to put the shapes of the objects and a human body under doubt), but they did not go this far as to doubt the fact of the external world's˙ existence the second step by Descartes which indeed does not seem to logically follow from the fact that everything can be distorted in dreams or illusions.

This refusal to doubt the existence of the external world, however plain and tautological it may look, nevertheless, brings with it something new and useful in children's minds, as it clearly shows that there exists an important difference between the beliefs that earlier seemed to be equally true, such as the beliefs that objects really are what they look like and that objects, whatever they are, really exist outside the subject's mind it turns out that of the two only the latter is undeniably true and the former is not.

Since the children's belief in the outer world's existence proved to be rooted in the necessity for them 'to be somewhere'(that is, for them to exist as subjects), the time has come to shift the emphasis from the existence of objects to the subject's own individual existence.

Dialogue 3.Examining the child's capacity to doubt his/her own individual existence

In accordance with the development of Descartes' discourse the children were asked questions that had a purpose to determine whether they would allow for the possibility to put under doubt the fact of their personal existence. Apart from this, the˙ dialogue also aimed to double check the reliability of the children's answers given in response to experimenter's objections in the previous dialogue: if those children who allowed for the possibility to put under doubt the adequacy of their perceptual images of objects (including images of their own bodies) did this because of their 'liability' to the experimenter's arguments, then they would be quick to agree that their personal existence is doubtful either. To examine this, Dialogue 3 was shaped in the

form of a discussion between a child and the experimenter in which the experimenter repeatedly and in different terms asked the child questions about whether it was possible to put his or her personal existence under doubt. The questions were as follows:

1. So, you claim that you exist, don't you?

2. But can the following be the case that it only seems to you that you exist, but in reality, you don't exist?

3. Let us assume that you are asleep at the moment and it seems to you in your dream that you exist, that you are sitting here and answering my questions, but in reality, if you wake up, you will find that you don't exist. Can this be the case?

4. And can it seem to you in your dream that you don't exist?

5. And when you are asleep without dreams, do you exist or not? Why do you think so?

6. You know, I invented an interesting game. In this game we pretend that we are asleep and have a dream that we exist but in reality if we woke up we would find that we don't exist. Can we play a game like that? Why do think so?˙

As it was in some other dialogues, in this dialogue the first question was a verification of a trivial fact of the child's personal existence which had a function to launch the conversation. Questions 2 and 3 examined the children's capacity to provide some proofs of the fact that their personal existence could not be put under doubt if subjected to the accepted tactics of the 'shift of realities'. The next three questions were variations of questions 2 and 3; they examined whether the children were able to accept that they could be non-existing in the domains of reality other than the everyday reality, that is in their dreams, in play and in the condition in which they have no conscious states whatsoever (sleeping without dreams).

The first question was answered unanimously 'yes', the second and the third ones almost universally 'no'. Only four out of 95 children said 'yes' to questions 2 or 3, and they were unable to provide any reasons for this confirmative answer. All the rest strongly denied the possibility of putting their personal existence under doubt (Fig.15). Those children who produced arguments to ground their negative answers could be allocated to four major groups.

Children who acknowledged that they might not in fact exist (—o—).
Children who denied that this was possible and (1) gave no grounds or produced tautological and transductive justifications (- -o- -), (2) said that it was not possible for them to have subjective experiences of any sort and not to exist at the moment of having the experiences (—□—), (3) said that their experiences were so clear and obvious that it was not possible for them not to exist (—o—), (4) produced other types of justifications (- -o- -).

FIG. 15. Percentages of children producing answers in response to Question 3 regarding the possibility of a child not existing in the domain of everyday reality at the moment of being asked.

The most popular argument was very similar to that given by Descartes; it consisted of pointing out that it was not possible for someone to be aware of something (to have a dream for instance) and not to exist at the same time. 'I am thinking, therefore, I exist' justifications which implicated this Descartes' formula appeared first in some 5- year- old children, although in a rather primitive form ('I exist in this world. When I was in my mum's belly I had no dreams', 'If I didn't exist then there would be no dreams, no dream can emerge, and if I do exist then there is a dream').

Older children expressed themselves in a more exact way: 'Yes, I exist, otherwise how could I be able to feel myself?', 'If I didn't exist then I wouldn't be able to think or sleep', 'If I didn't exist how would I be able to have the dream that I don't exist?', 'If I didn't exist, then nothing would seem to me, nobody cannot have dreams', 'If there were no myself, I would not be able to feel that I am', 'I would not be able to imagine that I exist', 'If there is something that appears to be, then there must be somebody to whom this appears'.) Grounds like that were provided by most 6-year-oldsand older children (increase, 4 years to 6 years, $\chi 2 =8.35$, p<.004). The rest of the subjects tried to back

their opinions in various ways, all producing justifications different from those based on 'cogito': some referred to the clarity of their self-perceptions ('I exist because I am sitting here right now'), others appealed to adults' opinions ('Mama told me that if a person is on Earth then it is for life'), still others pointed out to the fact that such a long dream was impossible and therefore, what they were seeing and feeling at the moment was not a dream but reality. ˙

Questions 4-6 were similar to q.3, but they investigated the possibility of doubting one's personal existence in the domains of reality in which limitations of the everyday reality (including those put by the awareness of having certain conscious states) were relaxed (play) or absent (a dream). Question 5 examined the possibility of acknowledging one's nonexistence when one has no conscious states at all.

So, is it possible to have a dream in which the author of the dream does not exist? On the first glance the answer is obvious: everything can occur in dreams. Nevertheless, many of the children objected to this idea: 'I cannot see this in my dream because if I didn't exist the world would be empty and there would be no people in this world, 'What kind of dream would it be? This would mean there will be no dreams at all if I didn't exist', 'If there is nobody then there is nothing to dream about, 'All the dreams - they are yet your dreams, even if you watch them as though from the outside, even if you have a dream without you acting in it...otherwise you simply won't have any dreams')(increase, 4 years to 6 years, $\chi 2 = 5.71$, $p < .01$). ˙

In the domain of play which is closer to the everyday reality than is the domain of dreams, the possibility of doubting one's personal existence was denied by most 6-year-oldsand older children (increase, 4 years to 6 years, $\chi 2 = 11.25$, $p < .001$) with most of the children applying to similar arguments ('You can't play such a game, because if we don't exist, we cannot play', 'How can we play something if there are no ourselves?', 'When people create rules for a play, then that is it they exist already',˙ 'Somebody has to play the game nobody cannot play', 'No, how can we imagine that we don't exist?', 'Look, we've got legs and hands, and if we are to play such a game where do we to hide our hands?'). Other types of arguments, such as the appeal to other people's existence or pointing out to the fact of self-perception, were in the minority.

Paradoxically, even larger number of children denied the possibility of personal nonexistence in their responses to q.5 (sleeping without dreams). Here the possibility of doubting one's personal existence was rejected by the majority of children in all age groups, save the oldest one (decrease, 7 years/1gr. to 13

years/7gr., $\chi2$ =6.02, p<.02). Most preschoolers provided no grounds for their answers, whereas most schoolchildren again, as before, appealed to the argument which was close to 'cogito ergo sum' viewing sleeping without dreams either as a certain state of consciousness ('Yet I am asleep, therefore, I exist', 'I still am, I exist, I am lying in my bed', 'If I can be in my bed, therefore I exist') or as a temporary break in a stream of such conscious states ('I am, I am asleep, but I don't disappear anywhere', 'I exist, I am lying in my bed seeing no dreams., but then I wake up and see something, right?', 'I exist, because sometimes I wake up during the night, and if I wake up I am, am I not?'). In both cases the children revealed their inability either to imagine a subject who has no acting conscious states or to get to grips with the idea that such an absence means termination of the 'subject/object' division and, therefore, involves cessation of the subjects' existence. In both cases children's argumentation was based not on the conscious states (or the absence of such states) of the imaginative subject who is 'sleeping without dreams', but on their own 'here and now' conscious states. Lastly, a few other types of argumentation given in response to this question were as follows: appealing to the clear and distinctive character of self-perception ('I am, I can still feel that I exist even if I have no dreams whatsoever', 'I exist because I feel it, there is this special feeling that I am') and referring to the fact of other people's existence ('I exist because you and all the people exist, and I exist too.').

Yet, as it is obvious from Fig.16, a large number of subjects acknowledged the possibility of their nonexistence in the domains of dreams or play. Nevertheless, while acknowledging that a person can see a dream in which he or she does not figure personally and play a game 'as if it seems to us that we exist but in reality we don't', the absolute majority of children accompanied these assumptions with the statements that these assumptions were conventional('as though'), but not real. Obviously, the children could feel that answers to questions 4-6 implicated a subjects' presence in two areas of reality at one time: in the sphere of everyday reality (i.e., at the moment when the conversation was taking place) and in the spheres of dreams and play. In those spheres of reality in which logical control is relaxed or absent altogether situations are possible in which a subject can be unaware of his or her own activity ('Yes, because I can see a dream in which I am not acting but some other people are acting there', 'Yes, you can play such a game but only...as a fantasy',˙ 'In play everything can happen but in reality this cannot happen', 'You cannot play this game really, but you can in your imagination', 'You can play this, but when you wake up you yet

exist'); while acknowledging this, the children were nevertheless sure that 'really and truly' they existed.

Children who acknowledged that they might not in fact exist (1) in their dreams (—o—), (2) in their play (- -o- -), and (3) when they have no experiences of any kind (- -o- -).

FIG. 16.   Percentages of children producing answers regarding the possibility of a child not existing in his or her dreams (Question 4), play (Question 6), or when he or she has no experience of any kind (Question 5).
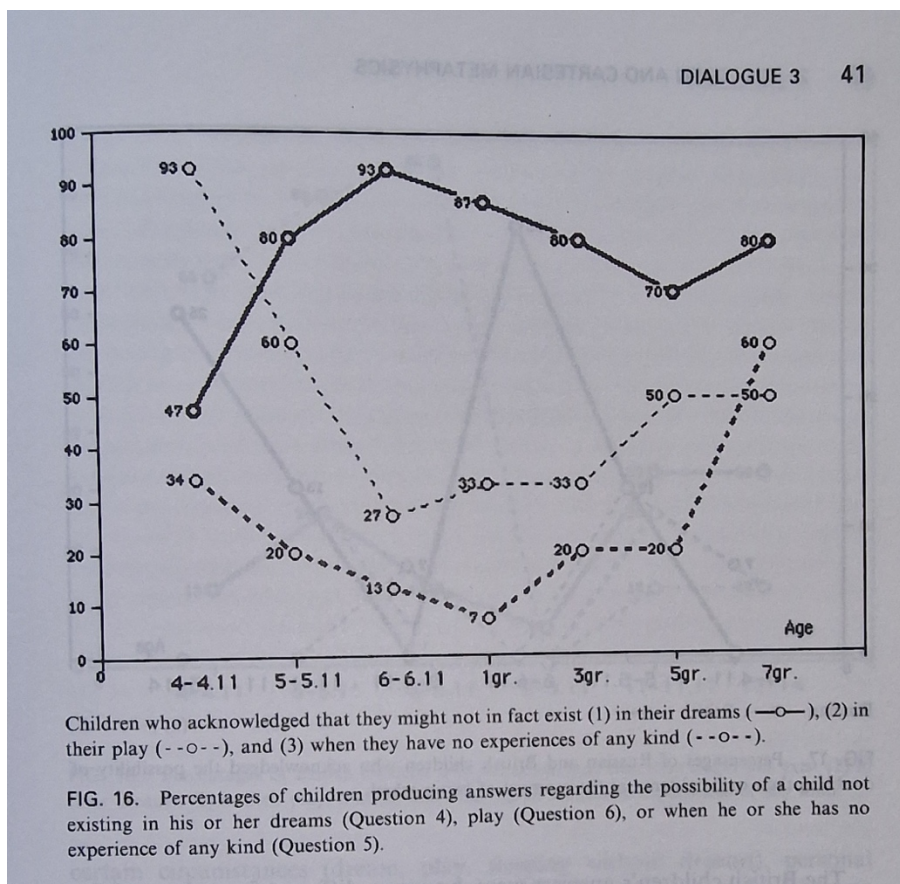
The same was the case regarding the question of sleeping without dreams. Some of the children did acknowledge that at that moment they did not exist, but they too accompanied the acknowledgements with comments that it was not 'really so'('I don't exist but...in reality I do', 'I do not exist during this state, but when I wake up I come back to existence', 'I do not exist for myself at that time, but for other people I do', 'It would seem to me that there are no myself and there is darkness only, but when I wake up, I can touch my body and see that I exist', 'I do not exist for myself, I somehow...go out of myself, but from the outside, if you have a look at me, I exist.').

The results of the replication study in Britain revealed that there were no significant differences between Russian and British children's answers with regard to questions about their own existence at the moment of interrogation: again, the overwhelming majority of British children of all age groups crucially denied that they could, in fact, not to exist (see Fig.17) and produced arguments similar to those given by their Russian peers.

FIG. 17. Percentages of Russian and British children who acknowledged the possibility of doubting their own existence at the moment of being asked.
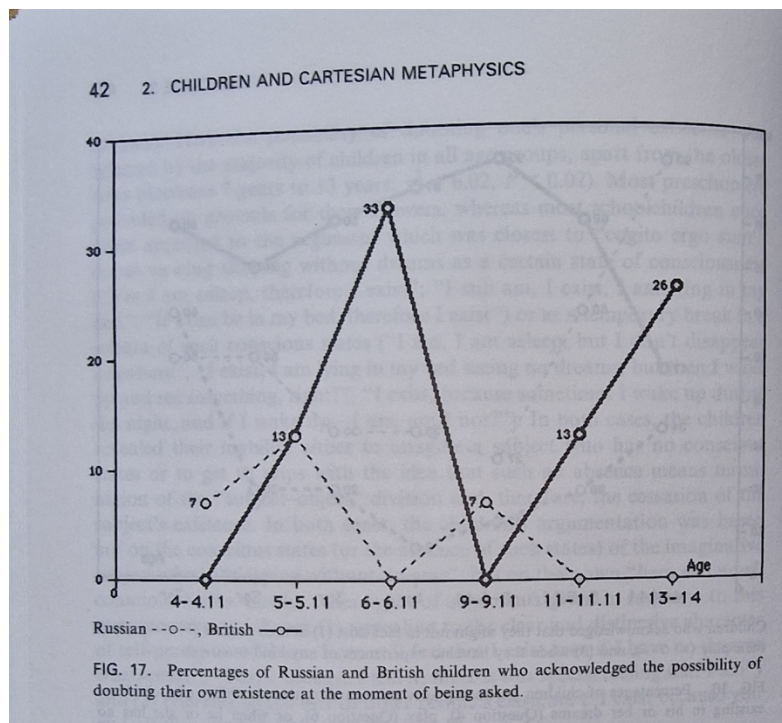
The British children's answers were, however, different from those of Russian children as far as the possibility of their personal nonexistence in the domains of mind others than everyday reality was concerned. Thus, 5-, 6- and 9-year-old British children were significantly less inclined to acknowledge that they could not exist in their dreams than were their Russian peers, and so were British 13-14-year-olds with regard

FIG. 18. Percentages of British children who acknowledged that they might not exist (1) in their dreams, (2) in their play, and (3) while having no subjective experiences of any kind.
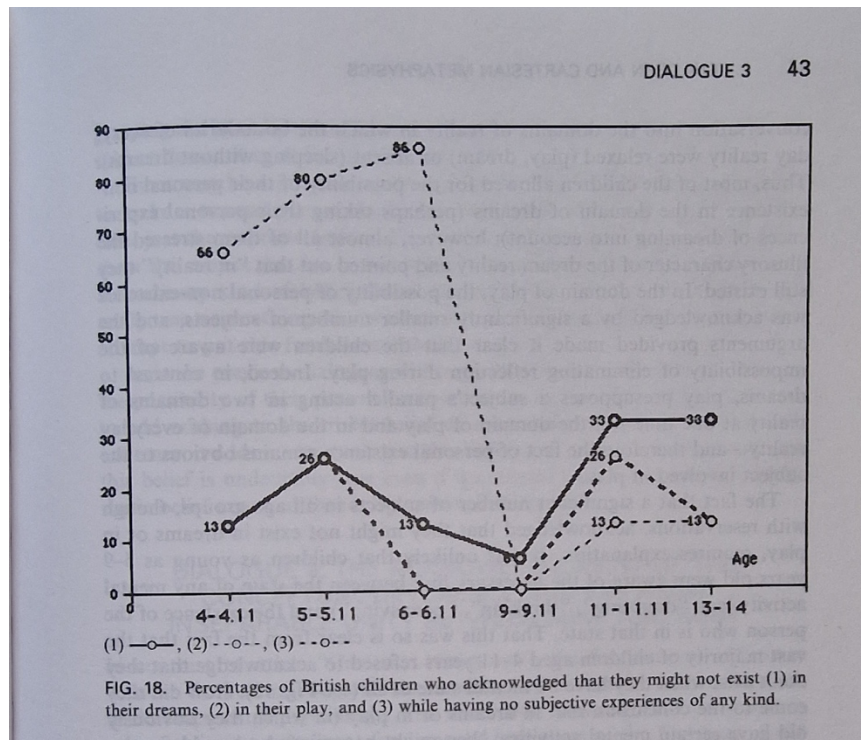
to the possibility of their nonexistence in the state of absence of subjective activity of any kind (see Fig. 18). However, British 6-year-olds admitted more often than Russian 6-year-olds that they could not exist in an imaginative role play (Fig.18). The fact that cultural differences appeared only regarding unusual states of mind (play, dreams, and the absence of conscious states) and were absent as far as everyday reality was concerned stresses even more the conclusion that personal existence of a subject within the everyday reality is viewed as a fundamental and unquestionable truth which is independent of age or cultural differences.

The results uncovered some curious facts. Firstly, they confirmed the earlier established fact (see Dialogue 1) about the fundamental and stable character of children's beliefs in their personal existence; not only a direct question about the possibility to put personal existence under doubt, but also indirect suggestions that, under certain circumstances (dream, play, sleeping without dreams), personal existence can be doubted, were answered negatively by almost all subjects.

Secondly, the dialogue revealed a new type of argumentation that many children used in order to prove the fact of their personal existence. When asked to provide grounds for their positive answer to the question 'Do you exist or not?' in Dialogue 1, most schoolchildren simply appealed to the clear and distinctive character of their self-perceptions which they viewed

as a reliable proof of their personal existence; in contrast, in this dialogue in which it was suggested that their perceptions can be misleading, most children invented a new type of argumentation that was very close to 'cogito ergo sum'. Interestingly, the children invented this type of proof quite independently from the experimenter: five-year-olds were the youngest who started to point out to the fact that thinking (doubting, feeling, experiencing, perceiving, etc.) was identical to being. With age number of such answers grows, and the formulations of the 'cogito' become more mature and free from the naturalistic flavor (for example, from the identification of being with physical being only.).

The strength of the children's belief in the fact of their personal existence was also evident from their answers to questions 4-6 that transferred the conversation in the domains of reality in which everyday reality stiff boundaries were relaxed (play, dream) or absent (sleeping without dreams).Thus, most of the children allowed for the possibility of their personal nonexistence in the domain of dreams (perhaps, taking their personal experiences of dreaming into account), however, almost all of them stressed at that the illusory character of the dream reality and pointed out that 'in reality' they yet existed. In the domain of play the possibility of personal nonexistence was acknowledged by a significantly smaller number of subjects, and the arguments given made it clear that the children were aware of the impossibility to eliminate reflection during play. Indeed, in contrast to dreams, playing presupposes the subject's parallel acting in two domains of reality at one time in the domain of play and in the domain of the everyday reality, and therefore, the fact of personal existence remains obvious to the playing subject.

The fact that a significant number of subjects in all age groups, though with reservations, acknowledged the possibility for them not to exist in dreams or in play, requires explanation. It was unlikely that children as young as 5- to 9-years-olds were aware of the necessary link between the state of any mental activity (like 'doubting', 'thinking', 'perceiving', etc.) and the existence of the person who is in the state. That this was so is clear from the fact that the great majority of the children of 4- to 11years old refused to acknowledge that they don't exist when they have no mental states at all (see Fig.9). How did they come to the conclusion that in dreams or in play (in which they obviously did have certain mental activities) they yet may be˙ non-existing? A plausible explanation to this is the way the children understood the question. When saying 'I may not exist in play or dream' the children may have viewed themselves not as those who played the game or had the dream, but as the acting

characters of the play or the dream. Clearly, the children may have had an experience of having dreams in which they didn't act as characters; they also may have played games in which they impersonated persons other than themselves. As it follows from the justifications the children gave to back their judgements, it was in this sense that they acknowledged themselves non-existing.

As for the condition in which the children were supposed not to have any mental states at all (sleeping without dreams), most of the children denied that they were non-existing in this condition. For the assessment of 'within subjects' differences McNemar's 'z' test for dependent samples was used (see Glass & Stanley, 1970). The total number of negative answers for this condition significantly exceeds those for play ($z=6.6$, $p<.05$) and dream ($z=4.7$, $p<.05$). Although every child drops into this state periodically, this state is not a subject for experience and leaves no traces in memory; therefore, understanding that in this state a subject does not exist for himself or herself can only be based on the child's ability to clearly see the identity between 'being' and 'thinking'. This was exactly what most of 4- to 11-year-olds lacked and only 13-year-olds in the majority have managed to get to grips with this negative mirror image of 'cogito ergo sum' (that is to grasp the idea that 'a subject having no subjective states' means that the· subject does not exist for himself or herself).

There might be a misunderstanding here in that Descartes' procedure aims to make a normal person doubt his or her own existence. This is not the case; just the opposite, the purpose of the Descartes' procedure is to show to the subject that his or her belief in his or her personal existence is not an ordinary kind of belief, but this is a kind of belief which is undeniably and really true something that can only be achieved though the (unsuccessful as it is) attempt to put this fundamental belief under doubt.

Again, as in the previous dialogue, it has to be noted here that although the fact of children's unanimous denial of the possibility of their personal nonexistence in the everyday reality may seem to add nothing to the trivial belief of a normal person in his or her own existence, yet it adds a new quality to this belief as it convinces the person that this belief is undeniably true even if questioned and is not a kind of dogmatic belief acquired through a pressure from outside.

Dialogue 4. The acknowledgement of the conceptual difference and empirical inseparable unity between the mind and the body

In contrast to the previously examined 'cartesian structures', the fundamental difference between human body and human mind has been paid some tribute in developmental psychology.

The distinction between these categories is one of the most˙ prominent fundamental structures of European world outlook, and has been incorporated into the system of semantic meanings, concepts, fine arts and other cultural structures. Piaget was the first who tried to demonstrate empirically the fact that as the child grows older he or she begins to differentiate between mental states (dreams, for example) and physical objects which are often confused by younger children (Piaget, 1929, 1962). In his studies, however, children's theories about mental and physical phenomena were examined separately and without linking them to the 'body/mind' relationships proper.

The problem has been raised directly in the study by Johnson & Wellman (1982). The authors found that children's concepts about the 'ontological status' of certain mental and brain functions change with age. Thus, primary schoolchildren (7 to 11 years old) assumed much more frequently than preschoolers that only the brain participates in acts of sensation, behavioral acts and in involuntary acts (coughing, sneezing) whereas the 'mind' is only involved in 'higher mental acts' (like thinking, memory, feeling). The number of children who viewed the brain as something physical and the mind as nonphysical was found to increase considerably with age. Although this study was a pioneering one it suffered certain methodological limitations: firstly, the criterion used for distinguishing between the physical and the mental was only one of many possible (accessibility or inaccessibility of phenomena to sensations), secondly, the emphasis of the study was made upon statistical comparisons between numbers of positive answers ('yes' or 'no') given to standard questions at the expense˙ of qualitative analysis of grounds given by children. In another study (Johnson, 1990) elementary schoolchildren (older then 7) were shown to acquire understanding of the brain as the locus of psychological attributes and identity. Even more optimistic results were yielded in the study by Inagaki & Hatano (1993) who found 4and 5-year-oldsto be able to distinguish between certain bodily and mental properties and realize that bodily organs can function independently from the person's conscious intentions.

Although the present dialogue was based on the criteria and logic put forward by Descartes, in certain respects it can be viewed as the development and extension of the above mentioned studies. It tested the children's capacity (1) to realize the inapplicability of categorical attributes of matter (form, position, movement in space, nutrition, mass, divisibility, accessibility to sense organs, etc.) to mental phenomena; (2) to ascribe to mental phenomena properties and functions that belong to them (such as knowledge, thinking, imagination, sensation); and (3) to understand the empirically obvious inseparable unity

between the subject's body and the subject's mind.

As mental phenomena the categories 'I' and 'thought' were used in this dialogue. The term 'I' was employed in a Russian study, whereas in the replication study in Britain the tern 'Self' was used as a traditional equivalent for the 'I' in the English language. Since 'I' is related both to the body and to the mind of a person, (see, for instance, Kon, 1978), the questions were posed in such a way as to determine whether the child was able to distinguish between the aforementioned aspects and, if so, then to which of them (the mental or the physical) he or she tended to associate his or her 'I'. The following questions were asked in this dialogue:

Part 1. Physical attributes: conceptual relationships between the notion of the body and the notion of the 'I'(thoughts)

1. Tell me, please, do you exist, yes or no?
2. Can you show me what you are?
3. So, your body is you, isn't it? And your hand is it you as well? And your finger is it you, too?
4. And your 'I' is it you, yes or no?
5. Tell me now, your 'I' and your body are they one and the same thing or they are not? What is the difference?
6. Can you draw your body on a sheet of paper, yes or no? What shape is it? Does it have a square shape or a round shape?
7. And can you draw your 'I'? What shape does it have a round shape or a square shape?
8. Can you draw your thoughts? What color are they?
9. Where is your body at the moment? Is it sitting in the chair?
10. And where is your 'I' and your thoughts at the moment? Are they sitting in the chair as well?
11. Can your body be thrown up in the air?
12. And can your 'I' and your thoughts be thrown up in the air?
13. What is the weight of your body??
14. And what is the weight of your 'I' and your thoughts?˙
15. What does your body eat?
16. And what does your 'I' eat?
17. And what do your thoughts eat?
18. Can you see your body and touch your body?
19. Can you touch your 'I'?
20. Can you touch your thoughts?
21. Can you cut a small piece (nails, hairs) from your body?
22. Can you cut a small piece from your 'I'? Can you cut a small piece from your thoughts?

*Part 2. Mental manifestations: conceptual relationships between
the notion of the body and the notion of the 'I'(thoughts)*

23. Do you know some verse? Who knows this verse: your 'I' or
your body? Who knows this verse: your thoughts or your brain?

24. Can you think of something now? What is it you are
thinking of? Who is thinking about X: your 'I' or your body?
Who is thinking about X: your thoughts or your brain?

25. Can you imagine an elephant now? And who is imagining the
elephant: your 'I' or your body? Who is imagining the elephant:
your thoughts or your brain?

26. Can you see me? And who is seeing me now: your 'I' or
your body? Who is seeing me now: your thoughts or your brain?

Part 3. Body and 'I'(thoughts): the ontological link

27. Tell me, have you ever been ill? And who was ill: your
body or your 'I'? Who was ill: your body or your thoughts? Can your
'I' get ill? And can your thoughts get ill?

28. Tell me, if someone's body died, would 'I' of this person
die as well? And what about the person's thoughts: would they die
as well?

29. So, if someone's body ceases to exist, his or her 'I' and
thoughts cease to exist either, don't they?

30. Tell me, can a cat make a scratch on your body?

31. And can the cat make a scratch on your 'I'? Can it make a
scratch on your thoughts?

32. If the cat made a scratch on you who is it who feels
pain: your 'I' or your body? Who feels pain: your thoughts or your
body? Can your 'I' feel pain? And can your thoughts feel pain?

33. When you fall asleep, does your 'I' disappear or does it
remain? And what about your thoughts: do they disappear or remain
if you are asleep?

34. When you fall asleep, does your body disappear, or does
it stay? Where is it? What does it do?

35. If you are asleep without dreams does your 'I' exist or
it doesn't exist? And what about your thoughts: do they exist or
not if you are asleep without dreams?

Let us briefly consider the results placing emphasis on the
children's comparisons between the body and the 'I'. Although
children treated 'I' and thoughts differently (with 'I' being
viewed as something closer to the body than thoughts), most of the
differences were insignificant, so that average numbers of answers
with respect to the 'I' and thoughts were presented in Fig. 19 and

Fig. 20.

With regard to Part 1 of the dialogue (the discrimination between the attributes of the body and mental phenomena) the key questions bearing on the distinction were questions 5- 22. Starting with the 5- year- olds, the majority of the children said that the body and the 'I' were not the same, however, not all of them were able to discriminate between the properties of mental phenomena and those of the body (see Fig.19 and Fig.20).

The children fell into two groups (Fig.19) with regard to their answers to questions bearing on the categorization of such attributes as form, position, movement in space, mass, nutrition, accessibility to sense organs (seeing and touching), and divisibility. The children of the first group attributed all these material properties exclusively to the body, denying that they could be attributed to the 'I' and to thoughts, whereas children of the second group related them both to the body and to mental phenomena.,

If the key question consists of more than one actual question, the line in the graph represents the average number of the answers of one particular type which was calculated on the basis of all of the answers given to the actual questions which relate to the key question. For instance, questions 6-8 relate to one key question which examines whether the child attributes shape only to the body, only to the mental entities, or to both the body and mental phenomena.

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Children who attributed shape (qq. 6–8, - -o- -), spatial location (qq. 9 & 10, —□—), displacement (qq. 11 & 12, —◇—), mass (qq. 13 & 14, —✛—), nutrition (qq. 15–17, —o—), accessibility to sense organs (qq. 18–20, —o—), and divisibility (qq. 21 & 22, --o--) only to the body, with the rest of the children attributing these properties both to the body and to the "I" (thoughts).

FIG. 19. Percentages of children producing answers in response to questions regarding the distinction between attributes of the body and those of the "I" (thoughts).

Thus, most 4- to 6-year-olds said that 'I' and thoughts could
be drawn, and even named their shapes and colors, without,
however, giving any arguments in support of this (the 'I' for
these children was 'round' or 'square', and thoughts were 'blue',
'yellow', etc.). The number of such children fell sharply with
age.

Children who denied that mental phenomena had shape
(increase, 5 years to 6 years, $\chi2=7.35$, $p<.01$) almost always gave
some reasons to support this view. Most 6-year-oldsjust stated
that it was not possible to depict the 'I' or thoughts graphically
('I' is a letter, and you can say it, but you can't draw it', ,'I'
is a word, you can't see a word. Thoughts also cannot be drawn
since they are words and talking'). Others supported this
assertion with the argument that the 'I' did not exist ('The 'I'
is all these things, not living things, but playthings; you can
only say 'I', there are no such things', 'I' is nothing, you can
only write down the letter 'I'). Still others said that 'I'
existed, but was invisible ('No, you can't draw it, because we can
not see it and imagine it', 'Well, the body is a kind of object,
and the 'I' is inside of me, it isn't really something, for
example you can't see it'). Finally, some of the children tried to
describe the nature of this invisible reality ('No, you can't draw
my 'I', because it only can show itself up in my good deeds and
bad deeds', 'I' it is my interests and fancies, how can I draw
my fancies?'). The children reasoned about the impossibility of
drawing thoughts in the same way.

In discussing the spatial location of the body, most children
simply agreed with the experimenter, saying that it was 'sitting˙
on the chair'. In contrast to the question about shape, not only
most 5and 6-year-oldsbut 30 to 60 percent of older children
said that 'I' had a position in space and was either 'sitting on
the chair' together with the body or located 'somewhere near' the
body ('My 'I' is around me...well, it is sitting here, but not on
the chair, but elsewhere; you simply can't think of it like that;
it's something...you can't grasp it, but it's in the mind.'). Yet
most part of the total sample of children denied that 'I' had a
location in space(increase, 4 years to 6 years, $\chi2=6.80$, $p<.01$):
some said it was because the 'I' simply didn't exist ('It is
nowhere, no matter how long you look for it, it is nowhere...'),
and some pointed out that the 'I' was 'in the word', 'in the
voice', 'in the mind', i.e., in those entities that didn't have any
specific location.

Children who attributed capacities of knowledge (q. 23, - -o- -), thinking (q. 24, —o—), imagination (q. 25, - -o- -), and perception (q. 26, —o—) only to the body (to the brain).
Children who attributed capacities of knowledge (- -△- -), thinking (—◇—), imagination (- -▽- -), and perception (- -□- -) only to the "I" and thoughts.
Children who attributed the above-mentioned capacities both to the body (brain) and to the mental entities (to the "I" and thoughts)—the rest of the children.

FIG. 20. Percentages of children producing answers in response to Questions 23–26 regarding the attribution of mental functions to the body or to the mental entities "I" and thoughts.

The question about the capacity to move was answered in a similar fashion. All children acknowledged that the body could be tossed in the air (swing). About half of the subjects said that their 'I' could move in space and most added that their 'I' would be moving together with the body ('I' will be together with my body, you can't take it away, the body is somehow attached to it', 'The 'I' can swing; my granddad would take my body and toss it in the air'); some identified movement of the 'I' with the movement of sound ('When I say 'I', I am tossing it in the air). Those who denied that 'I' could be moved in space (increase, 4 years to 6 years, $\chi2 =8.68$, $p<.004$) referred either to the fact that 'I' did not exist ('It seems that it exists, but it does not') or to the fact that it is a kind of extra spatial reality ('I' is only a· letter', 'It is something not physical, something unusual, invisible,'). Finally, two of the subjects admitted only the possibility of an imaginative nonphysical movement on the 'I' ('If the 'I' wants this it can be tossed in the air together with the body, but if it doesn't wish that, it stays still and the body will be tossed in the air alone', 'yes, it can move, for example,

I will be sitting and thinking that I am flying.').

More than half of the subjects ascribed weight to the 'I'; some said that 'I' weighed as much as the body, while others said that their 'I' weighed 'very little' (like a bit of down), but nonetheless had a definite weight ('more than the air', 'more than a match'); all these children answered an additional question 'If your 'I' is put on the scales, will the scale indicator move or it will stay still?' in the sense that the indicator would move. It was mainly older preschoolers and schoolchildren who denied that the 'I' had weight (increase, 4 years to 7 years/1gr., $\chi2 =5.7$, p<.02), some on the ground that 'I' did not exist ('It doesn't weight anything at all, since it doesn't exist, it can only be pronounced.'), while others pointed out its nonphysical nature ('I' is a figure of speech; it doesn't weight anything at all.').

Most of 5-year-oldsand half of the 6-year-oldsthough that mental phenomena had the capacity to eat; normally they said that 'I' and thoughts eat the same as the body, or they simply named various foods. The rest of the children thought differently and denied that 'I' and thoughts could eat (increase, 4 years to 6 years, $\chi2=8.68$, p<.004); in their reasoning they again referred either to the fact that the 'I' did not exist ('It doesn't eat˙ anything, because it is not real') or that it is not alive ('It doesn't eat anything, it is not a person my 'I'); others stressed the 'I' had nonphysical nature ('It is a word, and a word doesn't eat anything.'). They had similar things to say about thoughts: thoughts do not eat because either they do not exist, or they exist but are not alive, or they are not at all material, although they do, to some extent, depend on person's eating ('It is the brain that needs eating, and the brain produces out thoughts. If it doesn't eat, thoughts will be stupid and there will be few of them. But thoughts cannot eat, it is the brain.').

Many preschoolers said that 'I' and thoughts could be seen and touched, although most older children emphatically denied this (increase, 5 years to 6 years, $\chi2=6.70$, p<.01). Some of the children (mostly the younger ones) explained the impossibility for the 'I' to be seen and touched by saying that it was hidden under the surface of the body ('It can't be seen and touched, it is in my head', 'You can't open up a person, so how can you touch it?'), others said that 'I' didn't exist, still others argued that it was nonphysical and symbolic ('You can't touch a word, can you? You cannot see or hear how it gets through the mouth'); finally , a group of children simply pointed out that 'I' was inaccessible to sense organs ('It is only space, it's invisible', 'It is something that you can't feel', 'It is my range of interests, how can I touch it?'). In discussing the inaccessibility of thoughts to vision and touch, the children used similar arguments.

A small number of children (mainly in the two younger age groups) admitted the divisibility of the 'I', although they could not justify their opinions. Others denied that it was possible to divide the 'I' in the corporeal or material sense (increase, 4 years to 6 years, $\chi^2=8.68$, $p<.004$) and produced several kinds of reasons. Preschoolers often referred to the fact that the 'I' was hidden under the surface of the body ('No, you can't cut it off because it is in your mouth'), others linked the indivisibility of the 'I' to its nonexistence ('You can't cut it off, 'I' is only a letter and not some sort of being'), a third kind of the argument was that 'I' was the material shell of a sign, and that it couldn't be divided ('No, this is a word, and you can't cut anything off the word"); lastly, the fourth group of children described 'I' as some kind of ideal reality to which the concept of division is inapplicable ('No, you can't. You can cut off a piece from my 'I' in an abstract sense, perhaps, in some way destroy part of the soul for example, humiliate a person', 'No, it's impossible. For example, if you cut off a finger, I would remain without my finger, but I will still be myself, my 'I' would remain as it was').

On the whole, the results show a sharp decrease in the number of children investing their 'I's with material attributes which begins in the age between 5 and 6 (Fig.10). From this age on, physical properties were ascribed to mental phenomena by an average 20 percent of subjects, and characteristically, this ascription had to do almost exclusively with the 'I' and very seldom with 'thoughts.' Thus, if the children perceived the body as a full-fledged bearer of all physical attributes and thoughts as something relatively disconnected from these attributes, 'I' in the view of most of subjects had an intermediate status on the one hand, it was something nonmaterial, nonphysical, and, on the other hand, it still had some physical properties (mostly location, capacity for movement, weight and divisibility).

The extent to which various physical attributes were made into mental attributes also varied. The children linked such attributes as shape, nutrition, accessibility to sensations, and divisibility with 'I' to a significantly lesser extent than they linked location, displacement, and (however strange it may seem) weight (the difference between these two groups for the total sample is significant, with $z=7.2$, $p<0.5$).

Now let us consider the children's replies to the questions bearing on the possibility of relating various manifestations and properties of mental activity to the body and to the 'I' (thoughts) (questions 23-26). As our findings show (Fig.20), one group of children related psychological functions mainly to the body whereas the other group viewed them as special

characteristics of 'I'(thoughts). The age-related dynamics of children's answers were rather bizarre, with only one stable decrease in the number of answers attributing the capacity of having knowledge exclusively to the 'I' (thoughts) (6 years to 9 years/3rd grade, $\chi 2 = 19.54$, p<.001). Basically, in school age children, the tendency to identify mental activities exclusively with the 'I' and thoughts attenuated considerably: there emerged a large group of children who tended to ascribe these attributes to both the body and mental phenomena at the same time (third group). The number of children who ascribed various attributes of mental˙ activity exclusively to the body remained quite high (about 50%).

Let us look at the reasons given by children of the first group. The children of the two youngest groups answered the questions in monosyllables, with reasonable justifications appearing in seven-year-olds. Some of the children simply noted that thought, vision, imagination, and cognition belonged to the body ('It's the eyes that can see, and they belong to the body', 'It's the brain that can see; thoughts cannot see, because they don't have any eyes', 'It's the eyes that can imagine', etc.). Others pointed out that thoughts and 'I' did not exist and were incorporeal, and hence could neither think nor imagine ('The body started to think; thoughts cannot think, they are only there', 'It's the brain which knows something, thoughts cannot have knowledge, because they are air, and air can't have knowledge of anything', 'It's the brain that can see; thoughts cannot see because they are not physical.'). The third group referred to the fact that thoughts were passive and derivative subjects, and hence could not have the attributes of mental activity; it was the subject himself or herself who had these attributes, and the child identified the subject with the head, with the brain, or with the living person in general ('It's the brain that can think; thoughts do not think, they come out when the brain thinks them', 'The brain can know something, and if thoughts lived, they could know something too.).

The children of the second group gave two types of arguments. Some simply noted the identity between mental attributes and mental structures ('It is thoughts that think; the body cannot think, because after all it is the body', 'It's thoughts that think, the body cannot think, and the brain cannot think, because the brain is not thoughts'). Others viewed thoughts as an active agent and ascribed mental activities to it, while viewing the brain as a passive 'place' ('It's thoughts that have knowledge; the brain has not, because the brain is a bone', 'The brain cannot think because it's a bone, because it can't feel anything', 'It is my thinking that thinks; the brain cannot think, because the brain is the same as the body.'). Finally, children of the third group
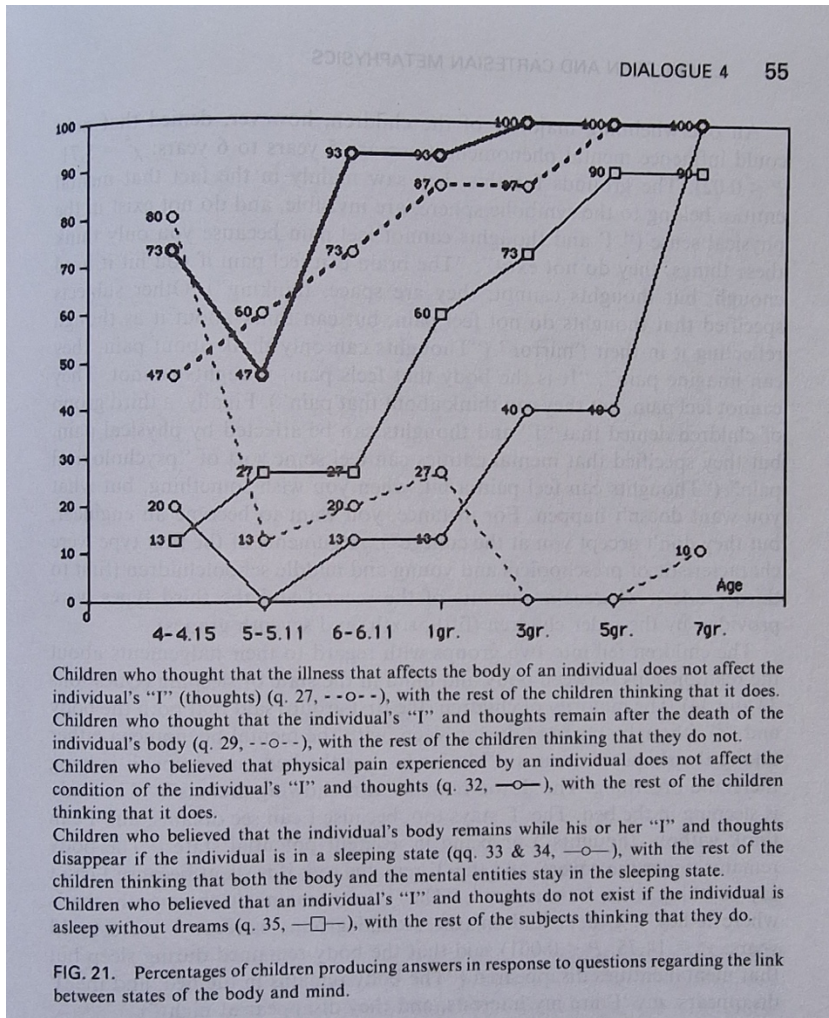
(mainly schoolchildren) expressed criticism about the way the question was posed; instead, they related mental activities to the category of an integral subject ('It is 'I' who knows', 'It is neither the brain nor my thoughts, but 'I' myself who knows this poem', 'Well, the entire head, thoughts and brain, think together'); some of the children simply ascribed mental activities to both thoughts and body ('My 'I' thinks this, and my brain too', 'The brain thinks, and thoughts too are able to think').

As it can be seen from the data, two different age related tendencies take place the one towards polarization of physical attributes and another towards a depolarization of attributes of mental activities. As the children grow older, the physical attributes are concentrated increasingly around the pole of the body, while the 'I'(thoughts) pole is gradually freed from them. In contrast, attributes of mental activity lose their one˙ sidedness and are increasingly ascribed to both the body and mental phenomena. Thus, on the one hand, the transition from preschool to school age was accompanied by a liberation of the categories of 'I' and thoughts from the grips of 'corporeality' and, instead, the children became aware of them as something different from the category of 'body'; on the other hand, the mental activities became increasingly more immersed in 'corporeality', since the children of this age began to realize that a close relationship exists between body and mental phenomena, and that the 'pure' spiritual activity that would not involve the body is impossible. It can be assumed that these tendencies taken together reveal in the child the formation of an embryonic notion about himself or herself as an integrated subject of activity: the 'I' gradually becomes for the child a symbol of a complex unity between his/her body (including his/her brain and sense organs) and his/her mental psychological functions.

Let us now come to *Part 3* of the dialogue examining the children's concepts about the ontological relationships between the body and mental phenomena. It has to be reminded here that, in contrast to the relationships between the concepts of 'body' and 'mind' ('I', thoughts) which is purely theoretical and concerned with abstract definitions rather than with 'real things', the ontological relationships between the body and the mind ('I', thoughts)refers to the body and the mind of a real human individual.

With respect to the question 27 of the influence of body state on mental phenomena ('I˙ and thoughts), children's answers˙ fell into two major groups (Fig.21). The children of the first group (mainly preschoolers) acknowledged that a morbid state of the body influences also the state of the 'I' and thoughts, mainly by making them deteriorate.

Paradoxically, however, most children denied the
relationship between illness and mental phenomena (second group;
increase, 4 years to 11 years/5gr., $\chi2 =5.58$, p<.02). Their main
argument was that 'I' and thoughts are ideal nonphysical realities
('It was the body that became ill. The 'I' cannot become ill, because letters don't get sick', 'Thoughts cannot get sick because they are merely words and sounds contained in the brain; it's the brain that can get sick.').

Children who thought that the illness that affects the body of an individual does not affect the individual's "I" (thoughts) (q. 27, - -o- -), with the rest of the children thinking that it does.
Children who thought that the individual's "I" and thoughts remain after the death of the individual's body (q. 29, - -o- -), with the rest of the children thinking that they do not.
Children who believed that physical pain experienced by an individual does not affect the condition of the individual's "I" and thoughts (q. 32, —o—), with the rest of the children thinking that it does.
Children who believed that the individual's body remains while his or her "I" and thoughts disappear if the individual is in a sleeping state (qq. 33 & 34, —o—), with the rest of the children thinking that both the body and the mental entities stay in the sleeping state.
Children who believed that an individual's "I" and thoughts do not exist if the individual is asleep without dreams (q. 35, —□—), with the rest of the subjects thinking that they do.

FIG. 21. Percentages of children producing answers in response to questions regarding the link between states of the body and mind.

The children answered the questions concerning the influence
of physical pain (bodily injury) on the state of the mind in a
similar fashion (questions 30-32). Only a few preschoolers said
that 'I' could feel pain; some of the subjects said that pain was
felt by the body and the 'I' (thoughts) together ('The 'I' and the
body feel together', 'My body and my thoughts feel together').
An overwhelming majority of the children, however, denied

that pain could have an influence on the mental phenomena (increase, 5 years to 6 years, χ2 =5.71, p<.02).The ground for this they saw mainly in the fact that mental entities belong to the symbolic sphere, are invisible, and do not exist in the physical sense ('I' and thoughts cannot feel pain because you only think˙ these things, they do not exist,' 'The brain can feel pain if you hit it hard enough, but thoughts cannot; they are space, thinking.'). Other subjects specified that thoughts do not feel pain, but can think about it as though reflecting it in their 'mirror' ('Thoughts can only think about pain, they can imagine pain', 'It is the body that feels pain, thoughts cannot. They cannot feel pain, but they can think about that pain'). Finally, a third group of children denied that 'I' and thoughts can be affected by physical pain, but they specified that mental entities can feel some sort of 'psychological pain' ('Thoughts can feel pain a bit, when you wish something, but that what you want doesn't happen. For instance, you want to become an engineer constructor, but they don't accept you in the college.'). Arguments of the first type were characteristic of preschoolers and young and middle schoolchildren (first to third grades), whereas arguments of the second and the third types were given by older children (fifth through seven graders).

The children fell into two groups with regard to their judgements about the relationships between body and mind in the state of sleeping (questions 33 and 34). The majority of children (the first group) said that both the body and 'I' (thoughts) existed during sleep, with the mental phenomena either taking the shape of dreams ('The body is in the bed and sleeps, it is lying there and breathing. The 'I' too remains, it is showing dreams', 'The body is sleeping in the bed. The 'I' stays too, because I can see dreams, and I can think with thoughts.') or being in a latent potential state ('The body remains under the˙ covers, and the 'I' remains too; it is silent because I can't say anything when I am asleep', 'The 'I' too remains, in the mouth; that's where it lies.'). Other children (the second group; increase, 7 years/1gr. to 13 years/7gr., χ2 =14.75, p<.001)) said that the body remained during sleep but the mental entities disappeared ('The body remains in the bed, and the 'I' disappears: my 'I' are my interests, and they disappear at night.').

Similar age dynamics showed up in children's replies to the same question (q.35) posed in a more emphasized way (the existence of the 'I' and thoughts during sleep without dreams). Most of the preschoolers and some of the schoolchildren said that mental entities existed in this state as well: some argued that mental entities were fixed in the brain and existed in the form of these material traces ('Thoughts depend on the brain, but the brain

doesn't disappear during sleep', 'I remember these thoughts. They are not manifested, but they exist if I remember them.'), others referred to the indestructibility of mental entities so long as the body was alive ('Thoughts exist, so long as I am not dead...thoughts remain anyway', 'Thoughts must remain. If they cease to be in me, then how will I be able to think about them the next time?', 'The 'I' remains in me even if I'm sleeping; I am alive'). In contrast, some of the preschoolers and the majority of the schoolchildren (increase, 6 years to 11 years/5gr., χ2 =4.80, p<.05) confirmed the existence of the body but denied that mental entities existed during sleep without dreams ('The 'I' doesn't exist, because when I have dreams, I am thinking about something, and when I am sleeping soundly, I'm not thinking about˙ anything').

Finally, let us examine the children's replies to questions 28 and 29 about the relationships between the existence of the body and the existence of the mental entities of a subject. The first group included children who said that the 'I' and thoughts persisted even after the death of the body. Interestingly, this group included mainly preschoolers and was poorly represented among schoolchildren (decrease, 4 years to 5 years, χ2 =10.84, p<.001). Four and five-year-olds gave no justifications for their opinions simply stating that the 'I' remains ('The 'I' remains; I don't know where it is, may be in the stomach.' 'It can remain in your mouth'), whereas the older children argued that since mental entities were nonmaterial they could not die ('The 'I' stays, but the body dies; the 'I' is always there. - Experimenter: Where?- In my will. - Experimenter: And can it live without the body? - Yes, it goes out into the air.' 'The 'I' remains; it can't die because it isn't anything. It goes to another person, to its neighbor, and may be, even to some unknown person.' 'The 'I' doesn't die, but you never hear from the person again this 'I'.' 'The 'I' remains in the person's head. - Experimenter: But what about the body and the head, do they die? - Well, they do, but the 'I'...if a person dies, the 'I' flies away. - Experimenter: But where does it go? - It simply turns into the air, that is it, or it turns into the wind; it is nothing. - Experimenter: But do thoughts die? - No, they fly away somewhere too, that is it.' 'The 'I' remains around the person. - Experimenter: But where is it then? - The 'I' is the air; that means that it can go where it wants.' etc.).˙
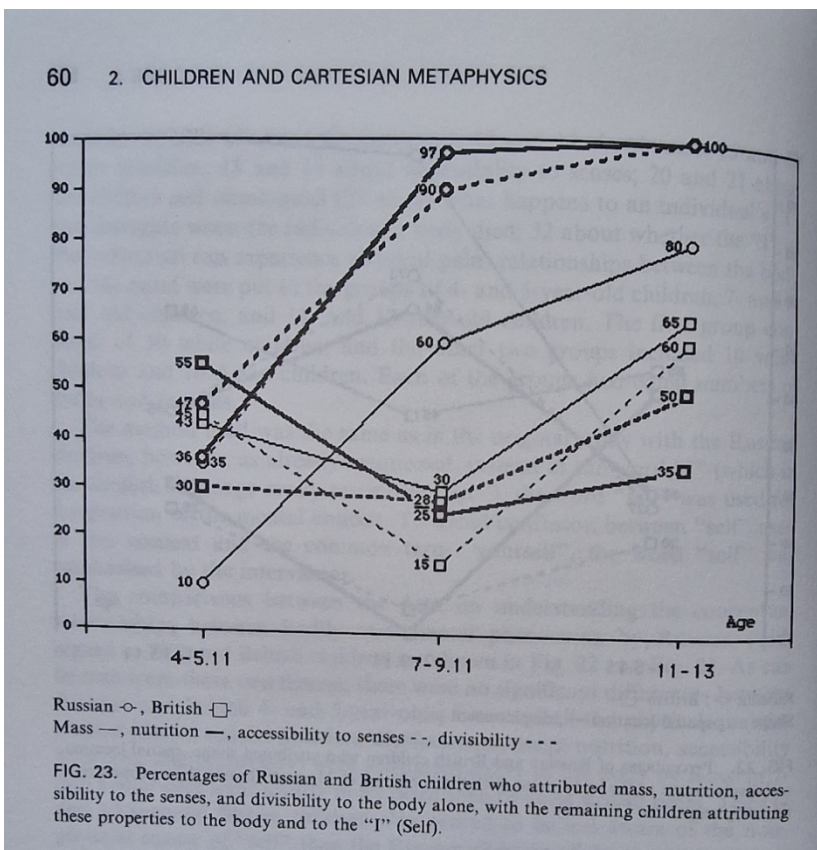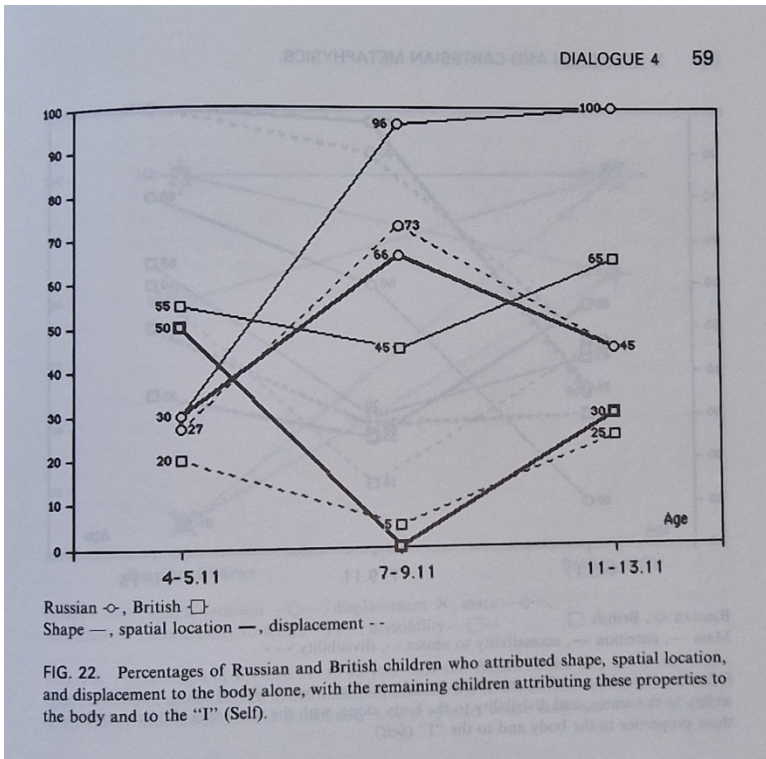
However, the majority of the children were sure that mental entities died with the body (the second group). The preschoolers and younger schoolchildren simply noted this ('The 'I' dies with the body. You don't see a dead person saying 'I, I, I'.' 'It dies with the body, because the 'I' is the person who is dying. Thoughts die too, because the person dies, and his thoughts cannot

think any more.'). Some schoolchildren specified that it was only individual mental entities that die, although they could remain in a 'converted' alienated form ('If thoughts are written down, they stay', 'Thoughts stay, like Tsiolkovsky. He invented spaceships, and died, and after him Korolev continued his work. But person's feelings die, because the person can't feel them any longer.').

Parts of this dialogue were replicated with British subjects. The replications study was carried out by Sharon Bland in her BSc research project (see Bland, S., 1994). In this study questions about conceptual (qq.6 &7 about shape; 9 &10 about location; 11 &12 about displacement; 13 &14 about mass; 15 &16 about nutrition; 18 &19 about accessibility to senses; 20 &21 about divisibility) and ontological (q.28 about what happens to an individual's 'I' and thoughts when the individual's body died; q.32 about whether the 'I' of the individual can experience physical pain) relationships between the body and the mind were put to the groups of 4 to 5-year-old children, 7 to 9-year-old children and 11 to 13-year-old children. The first group consisted of 10 white children, and the rest two groups included 10 white children and 10 of children Asian origins). Each of the groups had equal numbers of males and females.˙

The method used was the same as in the original study with Russian children, however, as it has been mentioned, instead of the word 'I' (which in English language has an oral resemblance with 'eye') the word 'self' was used for designation of the mental entities. To avoid confusion between 'self' used in this context and the common term 'yourself', the word 'self' was emphasized by the interviewer.

The comparison between the data on understanding the conceptual relationships between bodily and mental phenomena by Russian (with regard to 'I') and English children is shown in Fig.22 and Fig. 23. As it can be seen from the figures, there were no significant differences observed between Russian and English 4 to 5-year-olds, however, all the physical qualities studied (shape, spatial location, displacement, mass, nutrition, accessibility to senses and divisibility) were attributed solely to the body by Russian 7 to 8-year-olds significantly more often than by their English peers. Eleven- to thirteen-year-old English children too proved to be less aware of the nonphysical nature of 'self' then were Russian˙ children of the same age: shape, nutrition, accessibility to senses, and divisibility were attributed to both 'self' and 'body' significantly more often by English children then by Russian children.

Russian -o-, British -□-
Shape —, spatial location —, displacement - -

FIG. 22. Percentages of Russian and British children who attributed shape, spatial location, and displacement to the body alone, with the remaining children attributing these properties to the body and to the "I" (Self).

Russian -o-, British -□-
Mass —, nutrition —, accessibility to senses - -, divisibility - - -

FIG. 23. Percentages of Russian and British children who attributed mass, nutrition, accessibility to the senses, and divisibility to the body alone, with the remaining children attributing these properties to the body and to the "I" (Self).

Obviously, the stronger awareness of the body/mind dualism by Russian children can be explained either by certain cultural factors which made it easier for Russian children to realize the nonphysical nature of 'mental entities or by the linguistic differences between the terms employed in the dialogues ('I' for Russian children and 'Self' for English). To clarify that 12 English adult subjects (6 white and 6 Asian) were asked the same questions that were English children. It was assumed th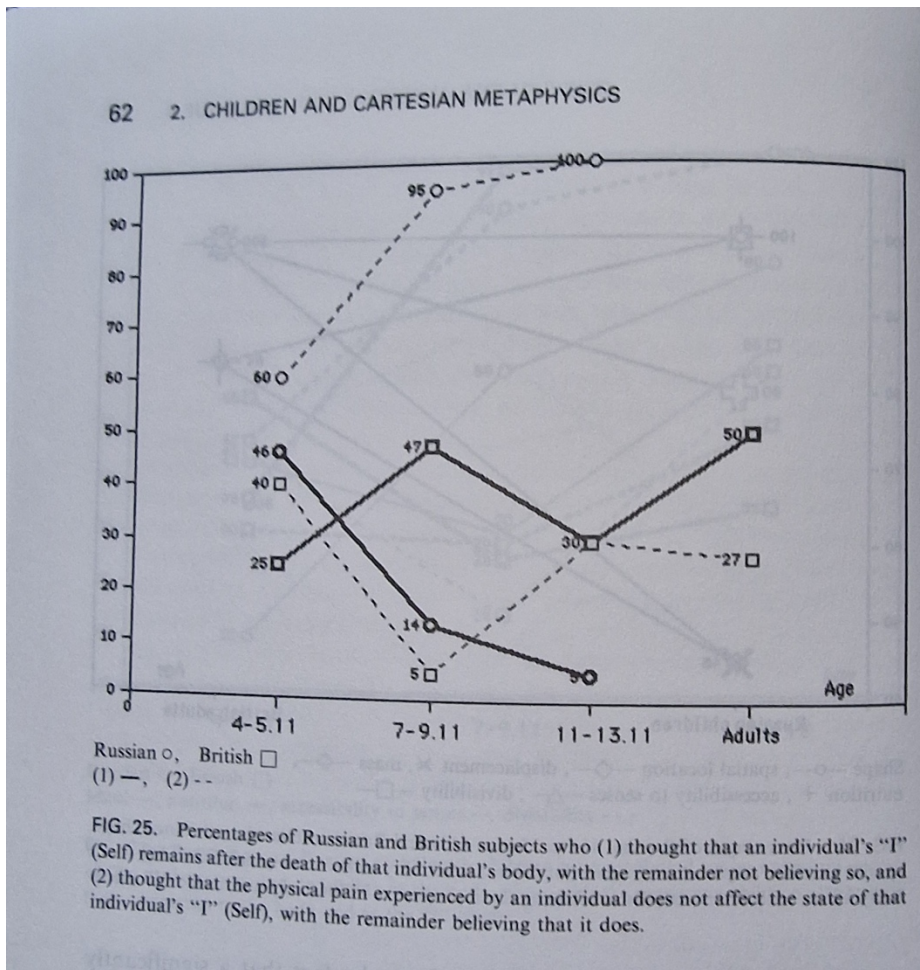at if the differences between responses by Russian and English children were linguistically (rather than culturally) based, then responses given by English adults would be closer to the responses of English children then to those of Russian children since linguistic peculiarities of the term 'self' are likely to be felt by children and adults to the same extent. If, however, it was cultural factors that made it more difficult for English children to realize the body/mind parallelism, then English adult could be expected to produce answers similar to those given by Russian children as the latter reflected the rationalistic views common to all Western countries (in particular, that mental entities possess no physical characteristics). Indeed, both Russian and British cultures are of European origins and can be expected to share fundamental metaphysical beliefs, with a strong conceptual body/mind parallelism being one of them. The results of the comparison between responses given by Russian 11 to 13-year-olds and English adults (see Fig.24) showed that English adults were even more strong in acknowledging that psychological entities ('self') had no physical characteristics then were Russian teenagers.

This makes the 'linguistic artifact' explanation of the relatively slow progress of English children in their awareness of the body/mind distinction unlikely; rather, the difference between Russian and English children answers should be explained by some cultural contextual factors. One of possible explanations of this can be found in the fact that Russian school education (and the general psycho-social background of Russian culture that has been under a strong influence of Marxist and materialistic ideas) of the early 1980th used to be strongly atheistically and rationalistically oriented which implied that a stress was made in education on the physical structure of the world whereas all sorts of 'animation' of natural forces were strongly discouraged. As concepts like 'I' , 'soul' and 'thoughts' are definitely of nonphysical nature, their unlikeness to physical objects was inevitably emphasized in the minds of children who were going through this kind of education.

Shape —o—, spatial location —◇—, displacement ✕, mass —✛—,
nutrition ✛ , accessibility to senses —△—, divisibility —□—

FIG. 24.   Percentages of Russian 11- to 13-year-olds and British adults who attributed shape, spatial location, displacement, mass, nutrition, accessibility to the senses, and divisibility to the body alone, with the remainder attributing these properties to the body and to the "I" (Self).

In contrast, in British culture which has never been ideologically biased by materialism a stress on the universal power of matter has been made to a significantly lesser extent˙ then in the Soviet culture, hence, the fundamental difference between 'self' and 'body' didn't seem to be of major importance; this may have been reflected in school curriculums and in the general knowledge about what 'self' is that children in this culture were getting from their social environment. Yet, the difference between 'self' and 'body' is acknowledged in British culture too, what reveals itself in the fact that British adults were very strong in keeping 'self' away from any physical attributes.

This explanation gets some support in the fact that somewhat lesser numbers of Russian children in both senior age groups attributed posthumous existence to the 'I' then did British children (see Fig.25), however, the difference was not significant. The fact that there turned to be a significantly more

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FIG. 25. Percentages of Russian and British subjects who (1) thought that an individual's "I" (Self) remains after the death of that individual's body, with the remainder not believing so, and (2) thought that the physical pain experienced by an individual does not affect the state of that individual's "I" (Self), with the remainder believing that it does.

Russian schoolchildren then British schoolchildren among those who thought that physical pain did not affect 'I' ('self') testified in the same direction, namely, that among Russian schoolchildren the awareness of the body/mind dualism was stronger than among their British peers; in this case, however, British adults showed a pattern of answers which was closer to that of British children then to that of Russian children which makes it difficult to divorce between the 'linguistic artefact' and the 'cultural background' explanations.˙

Yet the overall tendency of the data received is favor of the 'cultural background' hypothesis. It is interesting, however, that the cultural factors mentioned are selective and predominantly target the school age children. British and Russian preschoolers (4- to 5-year-olds) produced similar answers and revealed rather poor awareness of the distinction between 'I' ('self') and body, whereas British adults showed results which were quite close to those of Russian schoolchildren. Another interesting fact is that British adults (as well as British

schoolchildren) were significantly more 'dualistic minded' in their discussion of the ontological relationships between 'self' and 'body' then were Russian schoolchildren; enough to say that 50% of British adults revealed their belief in the posthumous existence of the individual's 'self'. This may suggest that the general cultural background in Britain which is deeply rooted in Christian mythology encourages the 'ontological dualism' to a significantly greater extent than 'conceptual dualism' whereas the materialistic and atheistic cultural background of the former Soviet society made stress on the conceptual dualism while suppressing the ontological dualism at the same time.

On the whole, two opposite tendencies could be traced in children's judgements about the relationships between the body and mental phenomena. On the one hand, the child's growing awareness of the autonomy of mental entities and of their relative independence from the state of the body, (i.e., illness and physical pain) becomes more and more apparent with age. The younger, and especially the older schoolchildren began to regard mental phenomena as nonphysical, ideal entities which are not subject to the body's distress although they are capable of reflecting it. At the same time the children develop the idea of a subjective type of distress which is fundamentally different from physical distress.

On the other hand, along with the development of notions about the relative autonomy of mental phenomena, the tendency towards comprehension of the indissoluble connection between the existence of the body and the existence of the mind becomes more distinct with age. Whereas in preschoolers and first graders there was a group of children who admitted the possibility that individual mental phenomena could continue to exist after the death of the body, there were almost no such answers among older children.

Thus, with regard to the relationships between the categories of the corporal and mental, there was a quite clear tendency toward differentiation between these categories in the child's consciousness, a breakdown of syncretic unity and a delimitation of notions about the body and mental phenomena as opposites; but when children reasoned about the 'existence' of the body and the mind, it was just as apparent that they were becoming more and more clearly aware, as they grew older, of the inseparable unity between the body and the mental phenomena.

With respect to the latter assumption there is one fact in the data that needs explanation, namely, the fact that most schoolchildren admitted the possibility that a living body could temporarily exist independently of the mental phenomena (sleeping without dreams). This, obviously contradictory, fact can find a

plausible explanation if it is taken into consideration that the correct answer to the question (that is that for the subject in this special condition both mind and body cease to exist) requires a strong capacity for decentration and for the distinguishing between the position of a subject who actually is in this state and the one who is talking about the subject sleeping without dreams. It may be assumed that in reasoning about the possibility for the body of the sleeping subject to exist during sleep without dreams, none of the children was able to place himself or herself in a position of the subject in question one more manifestation of the characteristic of the child's mind described by Piaget as 'egocentrism' (Piaget, 1986). Instead, the children based their responses on their actual position of an observer, for whom, of course, the body of the person sleeping without dreams does exist.

However, with regard to the question of the body that died, decentration of the mental position relative to the body was no longer necessary since, with death, the body disappears not only subjectively (for the sleeping subject) but objectively (for other people) as well. This also eliminates the possibility of justifying the further existence of subjective phenomena by referring to their connection to the body (to the memory or to the brain) the possibility which the children used when they acknowledged that a person who was sleeping without dreams yet had subjective reality which was lost just 'temporarily.' Hence, in answering this question, the only possibility of 'preserving' mental entities after the body's death could rest on the implicit assumption such as 'Death is a property of material things, subjective phenomena are not material, hence they are immortal'. This argument, explicitly used by Descartes, in children's judgements took form of placing the 'I' (thoughts) in the 'air', 'space', etc.

Nevertheless, with respect to the children who argued that 'I' and thoughts would stay after the subject's body died, an alternative interpretation is possible according to which these paradoxical replies might have been caused by the special way the young children understand death. As it was shown in a number of studies (Childers & Weiner, 1971; Nagy, 1940; Rochlin, 1959; Weininger, 1979) for the majority of 3 to 5-year-olds death is not an irreversible state in which all corporeal life stops, but rather a concealed life, a temporal and revocable state. It is not impossible that for these children 'death' is also the state when 'I' and thoughts of a dead person are still alive, whereas for older children who have a more adequate conception of death, these spiritual entities die at one time with the body. This assumption needs to be clarified.

Indeed, following the pioneering studies by Piaget (1925) and

Nagy (1948) a number of researchers tried to detect the development of children's conception of death. In the majority of the studies some specific details of children's responses to the question about death were analyzed including children's ability to grasp such characteristics of death, as its irrevocability and universality, as well, as the fact that death brings about the cessation of corporeal functions (Koocher, 1973, 1974, a,b; Safir, 1964; Weininger, 1979; White, Elson & Prawat, 1979). Some studies (Piaget, 1925; Koocher, 1973; Weininger, 1979) revealed that among children's answers to the question 'What will happen when you die?' there were answers relevant to the idea of reincarnation (i.e., spiritual immortability). However, in these studies questions about death and life referred to a human individual as a whole, without specification of whether they were asked about the death of the body or about the death of the mental capacities; hence, it was not clear whether the children's answers like 'going to heaven' given to the aforementioned question referred to the child's mind (soul) alone or to the child's body as well. It was also not clear whether the 'reincarnation' type answers were not a consequence of the child's misconception of death as a some kind of concealed life misconception that was typical for more than 80% of 5-year-oldsand 60% of 9-year-olds (White, Elson & Prawat,1979).

In contrast to the studies discussed above in this study the question was put in a different way, asking the children about the death of the body and the death of the mental entities separately. If the children's answers were based on the above mentioned misconception of death, they should have reasoned along the line that 'I' and thoughts of a dead person stay in the person's dead body (head, brain, etc.). In fact, however, there were only a few answers like that; in most of the 'reincarnation type' answers it was suggested that 'I' and thoughts of the dead person 'go out' of the body or that they can't die because, unlike the body, they 'don't really exist.' Besides, it should be borne in mind that the study was done in 1980 in the culture in which atheistic views strongly dominated; no wonder, therefore, that among the 'reincarnation type' answers there was not a single answer that would suggest that 'I' or thoughts of a dead person 'go to heaven.' All this makes the alternative interpretation of the causes of children's specific ('reincarnation type') answers quite unlikely. It is much more plausible to assume that the children's answers were dictated by the implicit reasoning which was close to the one put forward by Descartes. If it were so, why were such answers so rare among the children older then 7?

It has to be noted that reasoning which implies the idea of 'immortality of mind', although quite natural and making a

foundation of many religious systems around the world, is in a strong contradiction with the materialistic and physicalist world outlook. According to the latter, the mind and its manifestations ('I' and thoughts including) are nothing but products of the activity of the brain, hence, they have to cease to exist with the extinction of this activity. The installation of materialistic views in children's minds during school education might be responsible for the fact that children advanced in age abandon the conclusion about the indestructible nature of the human mind.

Another possible explanation is that with age children become more sensitive to the distinction between 'the mind' as a concept (a conceptual aspect) and 'the mind' as the mind of a concrete human individual (an ontological aspect). As it can be seen from Fig.12, the number of children who view the 'I' and thoughts as a reality which is very distinct from the body (so distinct that even illness or physical injury do not, actually, affect the mental entities) grows with age, whereas the number of children who think that the 'I' and thoughts can exist after death of the body decreases rapidly. If older schoolchildren viewed the 'I' and thoughts as pure products of the brain (the body) activity, they should have acknowledged that physical illness or injury would affect the mental entities to a much greater extent than it was actually the case. If this explanation is correct, then their refusal to accept the idea of the posthumous existence of the 'I' and thoughts was based on their more 'ontological' interpretation of the question of what would happen to the mental entities if the body died. Indeed, formally speaking, neither 'I' nor thoughts can die, since death (as the cessation of body functioning followed by the body decomposition) is a physical phenomenon and mental entities are nonphysical ones. However, personal experience convinces us that states of our mind do depend on the states of our body the experience which suggests that our mind, possibly, cannot exist without our body. The growing awareness of this 'conceptual vs. ontological' distinction might have been the cause that made older schoolchildren's answers so contradictory as far as they concerned questions about the implications that body illness and injury, on the one hand, and the death of the body, on the other hand, had for the 'I' and thoughts. This contradiction (which doesn't exist in 4-year-olds and is much less exposed in 5-year-olds) is far from being the specific characteristic of children's concepts of the relationships between the mind and the body, though; rather, it reflects the real contradiction which is inherent in our general understanding of the relationships between mind and brain which are viewed as mutually dependent and yet principally different

entities.

Dialogue 5. Definition of the criterion of truth and classification of the types of knowledge

The next step in the chain of Descartes' meditation is the one in which Descartes discusses the problem of finding the truth criterion.

In developmental psychology children's developing ideas of the true knowledge acquired through senses have been studied in a number of aspects, in particular as their developing capacity to distinguish between 'appearance' and 'reality'. This problem first appeared in connection with specific (non-conserving) answers that most children in the age before 7 give in response to the famous Piaget's 'conservation tasks'. In particular, Braine & Shanks (1965) showed that 5-year-old children were able to distinguish between 'what really is the case' and what 'only appears to be the case' if the questions asked made a stress on this kind of distinction ('Does it seem to be X?' 'Is it really X?') but performed significantly worse on the tasks if the questions were put in a neutral form ('Is this X?').

Developing this line of studies further, Tailor & Flavell (1984) suggested that two basic types of incorrect answers could be distinguished in children's responses to the tasks confronting 'appearance' with 'reality'. One type of errors (phenomenalistic errors) appeared on the tasks in which children were asked about objects' real and apparent qualities (like color or size) and repeatedly named the apparent quality which was available in their perceptual field. Another type of errors was that of 'intellectual realism' which dominated in children's responses to tasks about the objects' real versus apparent identity; in this type of answers the children insisted, for instance, that a sponge looking like a stone was in fact looking like a sponge. It was also shown that both types of errors were systematic and invariant with regard to certain cultural, semantic or memory variables (Flavell, 1986). It is not until children reach 11 to 12 years of age that they become able to cope with the 'appearance/reality' tasks. It was hypothesized that the reason for the mistakes in younger children was their incapacity to hold the idea that an object can be simultaneously represented in different forms (i.e., as what it appears to be and what it is 'really and truly'). The development of the appreciation of the 'appearance/reality' distinction was also linked to the development of conservation, visual perspective taking ability and some other psychological factors (Russell & Mitchell, 1985; Flavell, 1986). An alternative interpretation of the development of 'appearance/reality' distinction viewed this

development as a change in children's capacity of 'existence attribution' rather than as the development of their cognition and thinking only (Subbotsky, 1992).

One of the reasons for this 'non-cognitively based'˙ interpretation was a series of experiments in which it was shown that the sheer intellectual discovery of certain 'truths' about objects' spatial or causal relationships was insufficient for destroying the effect that these apparent relationships had on children's behaviors in real life practical situations (Subbotsky, 1990,b). In one of these experiments, children of 4 to 6 years old were shown rulers equal in lengths frame in the shape of the Müller-Lyer illusion, and then asked to take the rulers off the display and compare them by putting them together. After all the children acknowledged that the rulers were equal the rulers were returned on the board and the children were given (individually) a practical task of getting an attractive object which was beyond the child's reach. After a few unsuccessful trials the children were allowed to use one of the rulers to reach the object; it was assumed that if their phenomenal perception of one ruler being longer than another one was still active in their mind despite the newly acquired knowledge about the rulers' equality, then the number of children who would use the ruler from the dove-tailed part of the array will significantly exceed 50%. This was exactly what happened.

In another experiment children were showed the phenomenon of the change of water color (the clean 'water' becomes red when poured from two beakers into the third one) which they attributed to the influence of a red cardboard cylinder that had been put over the third beaker. Despite the fact that the children were later explained the real causes of the color change (they were told a pseudoscientific illustrated story in which molecular˙ effects were depicted in the form accessible to them), they still used the cylinders in the subsequent task with the aim to reproduce the effect. These and other studies show that child's ideas about the relationships between 'true' and 'false' knowledge go through a complex way of development and are affected by a variety of contextual factors.

The studies reviewed, however, were concentrated on a rather particular aspect of the relationships between 'truth' and 'falsity' in the sense that children's judgements about various perceptual arrays rather than about concepts of 'truth' and 'falsity' were under scrutiny in these studies. This aspect, however important, cannot replace the study in which children's developing notions about 'true' and 'false' knowledge would be examined.

Looking at the existing studies of children's developing

ideas about the concept of truth, it appears that they can be divided in two groups. The first group of studies is concentrated on the development of children's judgements about empirical (or functional) truth. This group of studies would include those on the appearance/reality distinction, as well as on children's ideas about certainty and uncertainty (Byrnes & Beilin, 1991). In the second group of studies the emphasis was made on children's understanding of necessity, in particular, on the way children begin to realize that some of the facts (statements) must be true (Piaget, 1954; Murray, 1990).

However, there is still a problem left of how and when children begin to distinguish between the empirical (or· functional) true knowledge and necessary (modal) knowledge (Leslie, 1993). It is this distinction that was made a focus in Dialogue 5.

Specifically, the aims of Dialogue 5 were to determine to what extent children were able (1) to point out that the intuitive clarity and distinctive character of a piece of knowledge is the only reliable criterion of truth, (2) to acknowledge the distinctions between various types of knowledge, such as knowledge about the fact of one's own personal existence, problematic knowledge (experimenter's claim that he has a cigarette lighter in his pocket) and dogmatic knowledge (knowledge about objects' names) , (3) to acknowledge that our senses can deceive us. The questions were as follows:

Part 1. The relationships between true knowledge and probabilistic knowledge

1. So, we found that you exist in this world, didn't we? Are you sure about this?

2. Why are you sure that you exist?

3. Is there anything in the world in what you are not as sure as in the fact that you exist? What is this?

4. For instance, are you sure that I have a cigarette lighter in my pocket?

5. If I said that you exist would this be true or not? And if I said that you don't exist would this be true?

6. And if I said that there is a cigarette lighter in my· pocket would this be true or not?

7. So, by what means can truth be distinguished from falsehood? What is truth? What is falsehood?

8. How can you find out whether you were told truth or false? For instance, if I said that there is a cigarette lighter in my pocket how can you find out whether I told truth or falsehood?

Part 2. The relationships between true knowledge and dogmatic Knowledge

9. You already know many things, for instance, you know how objects around us are named. Whom did you learn the names from? Did you learn them from adults?

10. If so, then the adults could have deceived you if they wanted to, for instance, they could have named some objects wrongly, couldn't they?

11. For instance, if all people would agree to try and convince you that an elephant is called 'a cat,' would you believe this or not? Why?

12. Well, is there anything in the world that nobody could deceive you about?

13. Tell me, what if all the people in the world would agree and try to convince you that you don't exist in the world, would you believe them or not? Why?

14. If you are very hungry and all the people would keep telling you that you are not hungry, would you believe this or not?˙

15. If you can see the sun in the sky but all people keep telling you that it's midnight and there's no sun in the sky, would you believe this or not?

Part 3. The relationships between true knowledge and knowledge acquired through senses

16. Tell me, where do your thoughts about objects, for instance, about this table or about the Sun, come from?

17. And if you can see a certain object, for instance, this table, does it really exist, or it is merely your imagination?

18. And what do you think about this: if you can see a certain object, for instance the Sun, is this object exactly the same as you see it is or it can be different in reality?

19. How big is the Sun? Is it big or small in reality? Can you cover it with your palm?

20. But the Sun as you can see it is a small object and you can easily cover it with your palm. Therefore, it doesn't look like a real Sun, does it?

21. Does this mean that it is not always that human eyes can see objects in a right way? Can human eyes make errors?

22. And if you can see a certain object from a distance and it seems to you that it is a fountain pen, but other people would say that it is a pencil, would you believe them or not? Why?
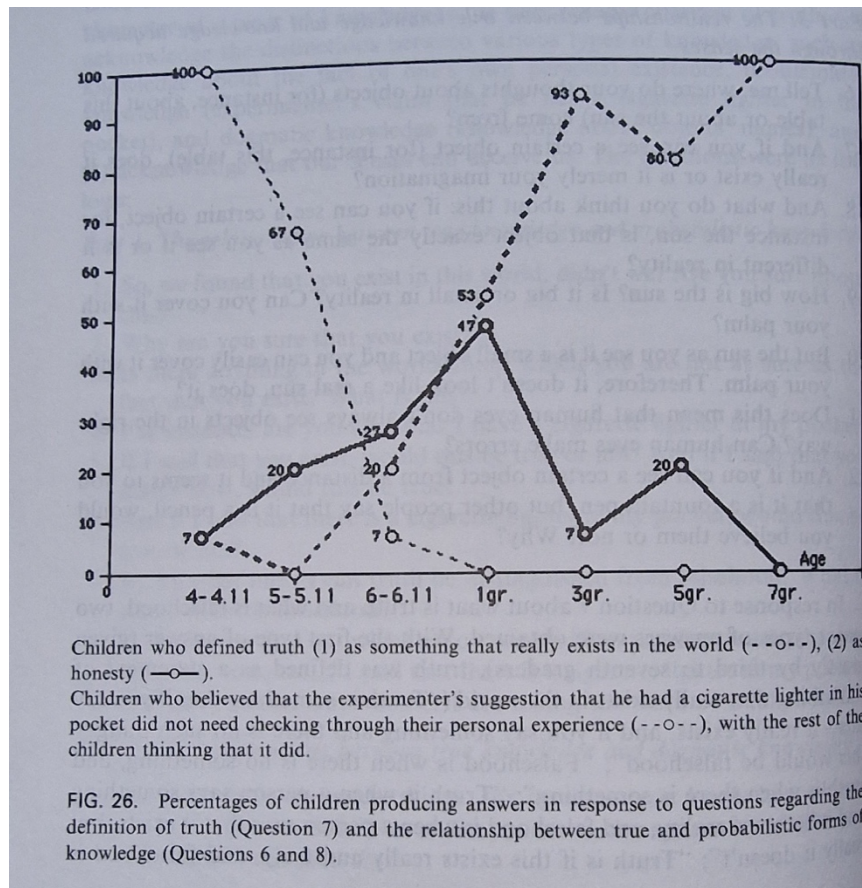
In response to question 7 about what truth is and what

falsehood is two major types of answers were obtained. In the first˙ type of answer (given mostly by 3- to 7-graders) truth was defined as a statement of something that really exists in the world ('Truth is something that if you say this it really exists, and if you say something and there is no such a thing this would be falsehood.' 'Falsehood is when there is no something, and truth is when there is something.' 'Truth is when a person says something and it becomes reality, and falsehood is when a person says that it exists, but really it doesn't.' 'Truth is if this exists really and truly, and falsehood is when there can be no such a thing.' 'Truth is when a person says truth, and there really is what he or she says about in this truth.' 'Truth means to say something, that it is, that it is exactly what it is, that it exists. Falsehood is the opposite thing, what doesn't exist, or it is a half of something that exists and a half of another thing that doesn't exist.'); the number of such answers increased with age, 6 years to 9 years/3gr., χ2 =13.57, p<.001 (Fig.26).

In the second type of answers the definition of truth was linked with moral duty or responsibility ('Truth is not to deceive people.' 'Truth is when people are honest.' 'Truth is when a person never tells lie.'). Most preschoolers, however, were unable to give any definition of what truth was.

Answering questions 6 and 8 about the relationships between truth and probabilistic knowledge (the experimenter's claim that he had a cigarette lighter in his pocket, see Fig.26) most preschoolers considered it superfluous to check the information ('Yes, it is truth...Is there really a cigarette lighter there?' 'If you say so, it is true.'), however, most schoolchildren˙ thought that the information is problematic and should be checked through personal experience in order its truth or falsity could be determined ('It's not true, because your pocket is rather flat, it would be convex if there were a cigarette lighter there.' 'You can't be sure unless the person shows it to you.' 'You have to ask the person to show the cigarette lighter to you.' 'You have to check it.', etc.) (increase, 5 years to 6 years, χ2 =9.18, p <.01).

Children who defined truth (1) as something that really exists in the world (- -o- -), (2) as honesty (—o—).
Children who believed that the experimenter's suggestion that he had a cigarette lighter in his pocket did not need checking through their personal experience (- -o- -), with the rest of the children thinking that it did.

FIG. 26. Percentages of children producing answers in response to questions regarding the definition of truth (Question 7) and the relationship between true and probabilistic forms of knowledge (Questions 6 and 8).

As before (see dialogue 3), no one of our subjects put under doubt the fact of his or her personal existence (q.13) and the fact of having personal experiences (the experience of hunger - q.14 and the fact of seeing the Sun in the sky q.15) (Fig.27). Answering question 13 which provoked the children to give justifications of the fact which they viewed as a reliably true (that is, the fact of their own personal existence), all the children produced grounds that would basically come up to those given in response to question 3 of Dialogue 3. Regarding the fact of having certain personal experiences (q.14 and q.15), most children grounded the impossibility to put this under doubt simply by referring to the clear and obvious character of these experiences. At that, most of the children stressed that they were the only persons who could judge about their personal experiences ('I wouldn't believe that I am not hungry, because it is myself who wants to eat.' 'I wouldn't believe that I don't see anything,˙ because if I see anything then it exists.' 'No, I wouldn't believe them, because it's myself who wants to eat and not some other person.' 'If I see the Sun and adults say that I don't, it means that they just want to call it in a different way.' 'You can

try to reassure me that I am hungry, but I will still be hungry.').

Children who believed that their knowledge about their personal existence was true and (1) produced no justifications of this (--o--), (2) justified this view by pointing out to the clarity of their subjective experiences (—o—), (3) said that it was not possible for a person to be aware of anything and not exist in the world (—□—).
Children who thought that their knowledge of having certain subjective experiences was true and (1) produced no justifications of that (—o—), (2) justified the view by pointing out to the clear and obvious character of their subjective experiences (--o--).

FIG. 27. Percentages of children producing answers in response to questions regarding knowledge of their own existence (Question 13) and knowledge of certain subjective experiences (Questions 14 and 15).

Responding to questions 10 and 11 of the relationships between true knowledge and knowledge dogmatically acquired from other people (knowledge about objects' names) children split in two different groups. Children of the first group (most preschoolers and 1st to 5- graders) stated that knowledge about objects' names was true. Two major justifications were given for that. Most preschoolers thought that the knowledge was true because it was received from adults and adults cannot tell lie ('No, I wouldn't believe that objects can have different names, because I was taught the names by my parents.' 'No, names are all true because adults don't like to tell lie.')(decrease, 4 years to 6 years, $\chi2=5.71$, p<.02).

However, most older children suggested that objects' names were true not because of the high moral standards of adults but simply because the names were the only possible ones that fit to the objects the phenomenon identical to that earlier described

by Piaget as the 'ontological realism' which, according to Piaget, persisted in children until they reached 10 years of age (Piaget, 1983). Characteristically, Piaget found that even if the child agrees that objects could be renamed, he or she still considers names not to be arbitrary but to reflect some object's inherent properties (for instance, the child can think that the name 'sun' involves the ideas of shining, of roundness, etc.). It is not until the age of 12 that children start to view names as strictly conventional and detached from the physical properties of their prototypes. Similarly, our data showed (see Fig.28), that it was not until 13 years of age (7th grade) that most children started to accept the idea of the objects' renaming. Before that age most of the subjects were sure that renaming was not possible, and even if somebody would tell them wrong objects' names they would quickly find out about it by just comparing the names with the real objects or reading about the right names in books ('It would be false if an elephant was called a cat.' 'No, I won't believe that an elephant can be called a cat, because an elephant has a trunk and a cat has not.' 'No, I won't believe it, even if all people would call an elephant a cat, because an elephant isn't a cat. - Experimenter: But how would you find out that an elephant is called an elephant if all the people would call it 'a cat'? - Because an elephant doesn't have moustache, it has a trunk.' 'They could try to persuade me that an elephant should be called a cat, but then I would have a look and see for myself that it was an elephant, that's it.'). However, half of the children in this group added that they would have accepted different names if they were smaller ('No, I wouldn't believe that objects have different names, but if I were very small and couldn't understand very much, I could have believed it.' 'I could have believed, but not now when I already know the names, but at that time… when I didn't know.').

Children who believed that knowledge about object's names is (1) true because adults can not tell a lie (—o—), (2) true because objects and their names are one and the same thing (--o--), (3) problematic because objects' names are conventional and can be misunderstood or deliberately distorted (—o—).
Children who thought that the knowledge that we acquire through senses is true because sense organs cannot deceive us (--o--), (2) problematic because our senses can be wrong (the rest of the subjects).

FIG. 28.   Percentages of children producing answers in response to questions regarding the relationship between true knowledge and (1) dogmatic forms of knowledge (Questions 10 and 11) and (2) knowledge acquired through the senses (Questions 21 and 22).

To the second group the children belonged who were completely aware of the fact that object's names are conventional and do not reflect the object's physical properties ('Of course, I would believe, because I wouldn't know that the elephant is called an elephant, I would call it 'a cat.' 'I would not agree at first, but if I then go to the Zoo and there will be written 'a cat' on the label, I'd believe.'). This type of answers only was predominant among the eldest subjects (increase, 6 years to 11 years/5gr., $\chi2$ =4.47, p<.05).

Lastly, while assessing the knowledge about the identity between subjective images and objects that evoked them, most children of 4- to 6-years thought that the images were correct because the eyes couldn't make mistakes; even if the children acknowledged that the visible image of the Sun was smaller in size than the real Sun (what most of the children did) it was not enough to make the children doubtful about that the image was a strict copy of the object (decrease, 5 years to 7 years/1gr., $\chi2$

=10.15, p<.01).

This fact seems to be of a particular interest since it shows the discrepancy between children's capacities to understand mechanisms of human perception and their conception about true or false knowledge. As it was shown in previous studies (Flavell et al., 1981; Pillow & Flavell, 1986), young preschoolers can show a notorious proficiency in understanding some perceptual mechanisms. For instance, Pillow & Flavell (1986) reported 4-year-olds(but not 3- year- olds) to be able to understand whether an object should be moved farther or nearer in order to decrease or increase in apparent size; the children of this age also were able to indicate how a circular object should be rotated to make it appear either circular or elliptical. The data are in a concordance with our results which showed that almost all our subjects (including 4-year-olds) were fully aware that a real magnitude of the Sun was much larger than the image of the Sun they had. Nevertheless, many of the children thought that the image was a true representation of the real object.

The rest of the children assessed knowledge acquired through senses as problematic since perceptual organs could go wrong ('An object can be different in reality. If I can see the Sun small I know that in reality it is big.' 'If the visibility is poor our eyes can be wrong, but if it is good, they cannot.' 'The Sun is different in reality, it is big and hot, but it seems to me that it is small and slightly warm.'). This type of answers predominated among older preschoolers (Fig.28)

In sum, the dialogue's results showed that during primary school years children's judgements about truth and various types of knowledge undergo noticeable changes. First of all, at approximately 9 years of age most children develop the notion of truth as knowledge which is identical to existence. In their view, the judgement is true only if the subject of this judgement really exists in the world and it is through personal experience only that the truth can be established. Interestingly, there is a certain gap between the age at which the children are able to formulate the notion of truth and the age when they realize the adequate ways through which the truth can be found; 53% of 6-year-olds and 73% of 1st graders were sure that true knowledge can only be established through personal experience (Fig.17), however, only 23% and 53% of them, respectively, were able to give the definition of truth which they viewed as a judgement whose subject really exists in the world (Fig.14). The difference between numbers of children who were on both sides of the above mentioned gap for the total number of subjects was significant, with z=4.24, p <.01.

Despite the fact that most preschoolers were unable to

formulate the concept of truth the idea of the identity between truth and existence was in fact present in their judgements about their personal existence and about their subjective experiences. Thus, most 6-year-oldsrealized that what made their knowledge about their personal experiences so doubtless was a mere fact that they were so clear and obvious.

In contrast to the unanimous and stable tendency of children to acknowledge the true character of knowledge about their personal existence and personal experiences, they became with age increasingly cautious about trusting other types of knowledge. Probabilistic type of knowledge was the first to evoke such skepticism: most 6-year-oldsnot only acknowledged the unclear character of the knowledge about the experimenter having a cigarette lighter in his pocket, but they also put under doubt knowledge acquired through senses. Both these types of knowledge are most typical for the kind of knowledge the children acquire through their independent practical activities. In contrast, knowledge about objects' names is normally acquired from adults as a part of the 'pack' of the culturally determined conventions people have about the world. The dissonance between this type of knowledge and what the children acquire through their independent exploration is highly unlikely. Perhaps, because of this impossibility to 'check through experience' the dogmatic type of knowledge looks like true knowledge for most preschoolers and primary schoolchildren. The discovery of the fact of the names' conventionality can only be a result of practice and experimentation with language (for instance, with foreign languages) what can be achieved only in relatively advanced age.

Dialogue 6. Judgements about the Almighty Subject

Dialogue 6 was an adaptation of Descartes' meditation about the necessary character of the conclusion that an almighty person really exists in the world as far as we have a mere idea of such a person.

The idea of the existence of the Divine Subject who is a creator and guardian of the laws of the Universe is deeply inserted in the Western rationalistic world outlook. It is discussed in the works of Descartes, Kant and other prominent ideologists of rationalism, but it goes back to the famous ontological proof of the existence of God created by the archbishop of Canterbury St. Anselm in 1078.

Yet the way contemporary children and adults brought up in Western cultures view and treat this famous logical puzzle has not been investigated by psychological means. The studies of developing conceptions about God available in psychology (Ney &

Carson, 1984; Zuberi, 1988; Basett et al., 1990) show that with age children's ideas about God become more complicated and adequate, however, the studies targeted children's dogmatic beliefs about God which are imposed on children by their culture and religious tradition rather than the children's independent thinking about the Supreme being.

With this regard, St. Anselm's ontological proof is of a special interest as it appeals not to sheer beliefs or faith but to the independent autonomous thinking of an individual about the necessity of the Supreme Subject's existence. It was with the aim of studying children's and adults' independent ideas about the Supreme Subject that this dialogue was undertaken which was an adaptation of Descartes' version of the ontological proof (i.e., meditation about the necessary character of the conclusion that an almighty person must really exist in the world as far as we have a sheer idea of such a person) (Descartes,1988). One particular problem with this dialogue was to find an appropriate term for the traditional Descartes' wording 'the supreme being.' The term had to meet at least three criteria: it had to (1) reflect the characteristic of 'almightiness' which is one of two key features˙ of the 'supreme being', (2) be in children's everyday dictionary and (3) not to interfere with religious tradition of culture to which the children belonged. The latter demand was the most important one since it was children's independent thinking and not their acquired knowledge about religious dogmas that was a major aim of the interrogation.

The selection of an appropriate term that could stand for the term 'Supreme Being' was a major problem here, and doubts might arise in the reader regarding the 'Almighty Wizard' (accepted as a substitute in this study) as an appropriate solution of this problem. Indeed, if Descartes in his studies was interested in proving the existence of God, why not to employ the term 'God' in dialogues with children?

The answer to this question lies in a specific cultural 'load' that the term 'God' has for a child educated in any Christian culture, or even in an atheistic European culture like the former Soviet Union was. If directly asked about the existence of God, the children would be likely to reveal their socially accepted beliefs about God , rather than their independent and autonomous thinking of the necessary existence of the Supreme Being. Thus, the children brought up in a Christian culture would be tempted to tell that God exists, as they have been taught in families and schools to think so, whereas children educated in the atheistic traditions would be likely to deny God's existence on the same ground. Hence, children's answers that reflect their conformity to the prevailing views could easily be mistaken for

their independent appreciation of the necessity of the existence˙ (nonexistence) of God. As it stands, engaging the term 'God' would inevitably bring about the pressure of external social control over the children's answers, thus violating one of the major principles of the free dialogues as they were laid down in the Introduction (i.e., that children should have no reason to mask or conceal their views on the problems they are asked about). All this made the use of the term 'God' in dialogues with children unacceptable.

Instead, in the search for an appropriate substitute the term 'Almighty Wizard' was selected. Of course, having selected the term, I was fully aware of the possible difficulties here, specifically, that the term 'wizard' may have undesirable connotations a fictious character, someone who is evil or at least mischievous. However, the second connotation is characteristic to English culture, and doesn't exist in Russian culture in which 'a wizard' (volshebnik) has no negative moral connotations. To account for the possible misrepresentation of the term by English children, similar dialogues were conducted with English adults who were explained in the preliminary interviews the conventional nature of the term 'wizard' as it was employed in the dialogues; as the result given by English adults didn't differ from those given by English or Russian children, it was unlikely that undesirable connotations of the term 'Almighty wizard' had played any significant role in children's judgements of the Supreme Being.

All these considerations made the term 'almighty wizard' a most suitable one to be employed in this dialogue. Firstly, it˙ eliminated the possibility to put the child on the track of displaying his or her religious ideas of God (if the child had any) which are acquired mainly dogmatically (see, for instance, Ney & Carson, 1984) . Secondly, the term was in an active dictionary of an average child . Thirdly, although the concept of 'almighty wizard' was not identical with the notion of the 'Supreme Being' reflecting only one side of the latter (that is, almightiness and omnipotence) and leaving aside its other important aspect (moral perfection), it was just the characteristic of 'almightiness' that was of the main interest for this dialogue since it is the 'almightiness' that is crucial for determining the link between having the idea of the almighty person and acknowledging the person's real existence.

Therefore, the aim of the dialogue was to examine to what extent children of various ages were capable of acknowledging this conclusion. The following questions were asked:

1. Tell me, please, do you know many things? Do you know

everything in the world? Who knows more than you do?

2. Can you do everything that you want? Who can do more things than you can?

3. Is there anywhere in the world a person or a fairy tale wizard who knows everything and can do everything s/he wants? Can such almighty wizard exist in a fairy tale? Can s/he exist in an imaginative play?

4. Tell me, please, is this almighty wizard capable of creating you or somebody like you?˙

6. Can this almighty wizard come out from a fairy tale or our imagination in the real world?

7. Can you imagine such an almighty wizard who would even be able to come out from your imagination in the real world?

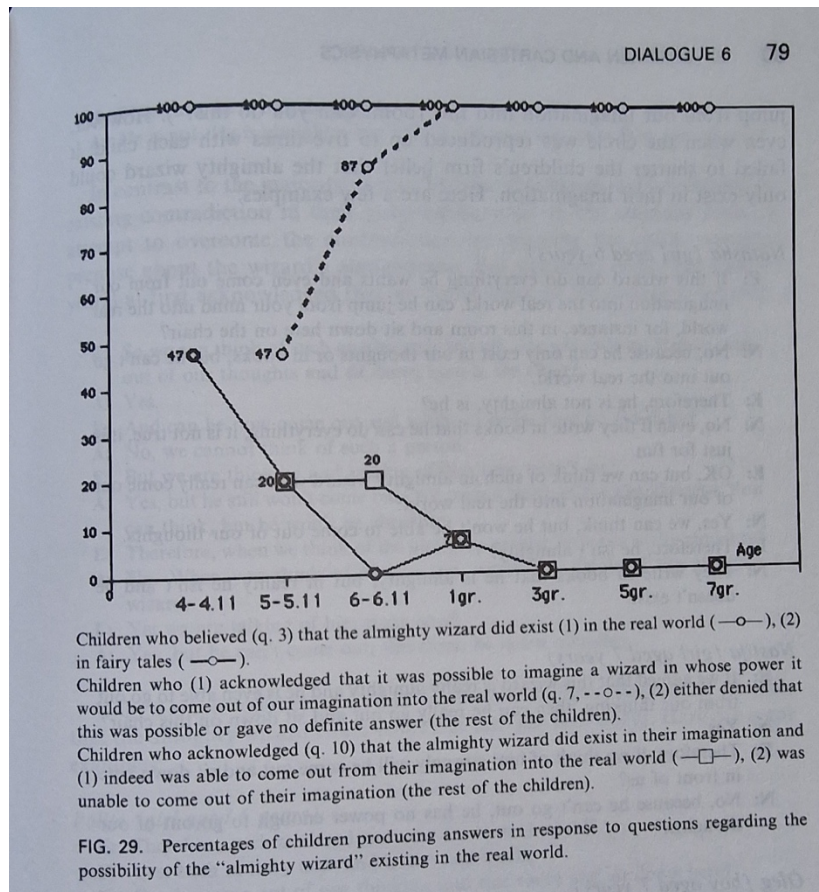8. Please, imagine such a wizard right now, O.K.?

9. But if you have the idea of the almighty wizard in your mind does this wizard exist in your mind?

10. But if this wizard is almighty and s/he exist in your mind, can s/he jump out from your mind in the real world, for instance, in this room and sit down over there on the chair? Why do you think so?

The dialogue had several stages of discourse. In the first stage (Questions 1-3) it was examined whether the children were inclined to acknowledge real existence of the almighty wizard in the domain of the everyday reality and in the domains of fairy tale and imaginative play. The aim of the second stage was to determine the contents the children link with the notion 'the almighty wizard' (Questions 4 -7), in particular, whether they thought that almightiness included the capacity for the wizard to 'come out' from play or individual's imagination into the real world. At the third stage (Questions 7 - 10) the child was put through the series of steps that had to bring him or her to the awareness of the link between the acknowledgement that the imaginative wizard is almighty and the acknowledgement that such a wizard had to be able to come out of the imagination, that is, had to have real, and not only imaginative, existence.˙

The results of the first stage (reflected in Fig. 29) showed that real existence of the almighty wizard was acknowledged by a few 4-year-old children who identified him with a fairy tale wizard who lived 'in the forest', 'in the woods', 'on another planet.' Obviously, this acknowledgement was based on the children's dogmatic acceptance of the fairy tale's character as a real thing and had nothing to do with the acknowledgment based on the ontological argument. The overwhelming majority of children denied that the almighty wizard could really exist in the world (increase, 4 years to 6 years, $\chi2 =6.70$, p<.01). At the same time,

all the children acknowledged that such a person could exist in
play and imagination.

Children who believed (q. 3) that the almighty wizard did exist (1) in the real world (—o—), (2)
in fairy tales (—o—).
Children who (1) acknowledged that it was possible to imagine a wizard in whose power it
would be to come out of our imagination into the real world (q. 7, - -o- -), (2) either denied that
this was possible or gave no definite answer (the rest of the children).
Children who acknowledged (q. 10) that the almighty wizard did exist in their imagination and
(1) indeed was able to come out from their imagination into the real world (—□—), (2) was
unable to come out of their imagination (the rest of the children).

FIG. 29. Percentages of children producing answers in response to questions regarding the
possibility of the "almighty wizard" existing in the real world.

Further questioning revealed that some of the children did
not acknowledge the almighty person's ability to create a boy or a
girl; the most typical explanation of this was that the wizard
couldn't do this because he really didn't exist ('He is in a fairy
tale, and I am not.' 'How can he create me, or someone like me? He
is not alive, wizards don't really exist.' 'No, these
wizards...there are stories about them, but they don't exist in
reality.'). However, these children too agreed that ' 'inside a
fairy tale' the wizard can create everything, including a living
child.

In response to question 6 all but 3 children denied that the
imaginary wizard could come out of the fairy tale boundaries ('No,˙
he cannot, because it's just a play.' 'No, because he is in a fairy
tale.' 'No, he is simply drawn on paper.' 'No, because a fairy tale
is just...words for children to make their life happier.').
Question 7 (whether or not we can imagine a wizard in who's power
it is to go out of our imagination') which played a crucial role

in the 'ontological argument', proved to be too difficult for 4-year-olds who were unable to produce sensible responses or denied
that such a wizard can be imagined. Nevertheless, 47% of 5-year-olds, 87% of 6-year-olds and all older children answered in the
positive (increase, 5 years to 7 years/1gr., $\chi2=8.35$, p<.01). However, in the third stage of the dialogue almost all of them crucially refused to make a conclusion that such a wizard had to really exist.

In order to make sure that children's negative answers were not situational judgements, the contradiction in their judgements (that is, the fact that the wizard in who's power it was to leave the domain of our imagination, was unable to do so) was pointed out to them in a subsequent discussion. The discussion took form of strengthening and emphasizing the ontological argument ('O.K., and now let us imagine the wizard number two who is even more powerful then the wizard number one and who really can jump from our imagination into this room, can we do this?'); however, even when the circle was reproduced up to 5 times with each child, it failed to shatter the children's firm belief that the almighty wizard could only exist in their imagination. Here are a few examples:

Natasha (a girl, 6 years)
- If this wizard can do everything he wants and even come out from our imagination into the real world, can he jump from your mind into the real world, for instance, in this room and sit down here on the chair?
- No, because he can only exist in our thoughts or in books, but he can't go out into the real world.
- Therefore, he is not almighty, is he?
- No, even if they would write in books that he can do everything, it is not true, it is just for fun.
- But o.k., can we think of such an almighty wizard who can really come out of our imagination in the real world, or we can not?
- Yes, we can think, but he won't be able to go out of our thoughts.
- Therefore, he isn't almighty?
- They write in books that he is almighty, but in reality, he isn't and he doesn't exist.

Nastija (a girl, 7 years)
- If we agreed that this wizard is really almighty and he even is able to go out from our thinking , then he can really go out and sit down on this chair, can't he?
- Yes.

- Therefore, if we strongly think of him, he will come out and sit down here in front of us?
- No, because he can't go out, he has no power enough to go out of our thoughts.˙

Oleg (a boy, 7 years)
- Well, but if the wizard is almighty and he exists in our thinking, then he can now go out and sit down right here?
- No. We are just thinking of him and imagining that such a person exists, just like those people who believe that there is God in the world, but in reality, there is no God.

Artiom, (a boy, 9 years)
- Look, if the wizard exists in our thoughts and can go out of our thinking in the real world, he will go out and sit down here, won't he?
- No, he is only in our thinking, but not outside it.
- But can we think of such an almighty wizard who is even more almighty than the first one and who can really go out to the real world?
- We can, but this is only fantasy. In reality he, however powerful, cannot go out of our thoughts, because he doesn't exist, he can only be conjured up.
- Therefore, he is not almighty?
- He is not. He is almighty, but only in his own way, in a fairy tale way.

In contrast to the majority of the children who merely acknowledged the existing contradiction in their judgements, some of the children made attempts to overcome the contradiction by rejecting the earlier accepted premise about the wizard's˙ almightiness. For instance, Ania (a girl, 13 years) at first acknowledged that we could think of the almighty wizard:
- So, we can think of such an almighty wizard who even is able to come out of our thoughts and sit down here in the chair?
- Yes.
- And he can now come out and really sit down here on the chair?
- No, we cannot think of such a person.
- But we are thinking and talking of him now, aren't we?
- Yes, but he still won't come out. We cannot think of the almightiness. You can think, but he won't be almighty.
- Therefore, when we think of the almighty wizard, he is not really almighty?
- No. when you think of him...no, we cannot think of the almighty wizard.

- Yet we are talking of him right now?
- Yes, but he can't come out, therefore, he is not almighty.

Only a small group of 5and 6- year- old children acknowledged the possibility for the almighty wizard to come out in the real world. Here are some examples.

Polina (a girl, 6 years)
- Therefore, such a wizard can exist in the real world?
- Yes, both in fairy tales and in the real world.
- Can he come out of our thinking into this room and sit down here?˙
-Yes, he can. I am very fearful that it would occur to him to come out, I don't like wizards.

Roman (a boy, 6 years)
- And this almighty wizard can now come out into the real world?
- Yes, he can.
- Why can't I see him then?
- I don't know. Perhaps, he doesn't want to.

Summing up the results of the dialogue we can see that on the edge between 5- and 6-years children come to the appreciation of the distinction between various domains of reality, namely, between the domain of the everyday reality in which no personified almighty subject is possible and the domains of unusual realities (such as fairy tales, imagination and fantasy) in which the almighty wizard can exist. Noteworthy, this borderline between the domains of realities is viewed by most children older than 5 as impermeable for the wizard: they refuse to let the almighty imaginative subject through the borderline even under the pressure of the ontological argument, that is, being aware of the fact that the wizard in question was not an 'ordinary fairy tale wizard' but an almighty subject whose real existence had to be acknowledged on the ground of the sheer fact of thinking of him (imagining him). It was also obvious that even those few children who acknowledged the almighty wizard's real existence did it on the basis of their dogmatic beliefs in the fairytale wizards' reality rather than on the ground of understanding the logical necessity of the 'ontological argument'.
It has to be made clear at this stage that in philosophical terms the logical validity of the 'ontological argument' can be (and often has been) questioned. One of the known objections to this argument was put forward by Kant who argued that 'Time and labor... are lost on the famous ontological (Cartesian) proof of

the existence of a Supreme Being from mere concepts; and a man might as well imagine that he could become richer in knowledge by mere ideas as a merchant might claim that he had improved his financial position by adding a few noughts to his cash account.' (Kant, 1966, p.88). Similar objections were provided by some later commentators (see, for instance, Kenny, 1968). The weakness of the Kantian counter- argument seems quite obvious: he puts the idea of the Supreme Being on the same plane with all other ideas (such as the ideas we have about physical objects, fantastic creatures, angels, etc.) which require the 'a posteriori' proof to be acknowledged as really existing and not only imaginary products, although Descartes stated it quite clearly that whereas all other ideas can be created by a subject himself or herself (who, therefore, is uncertain about their real existence), the idea of the Supreme Being cannot. However, it is not my objective here to plunge in the deep of philosophical and theological disputes. What was of interest for me in this study was the psychological preparedness of a philosophically unsophisticated mind to accept the ontological proof, and as the children's answers clearly indicated, they were definitely unwilling to do so. Instead, the majority of the children produced objections similar to that created by Kant.
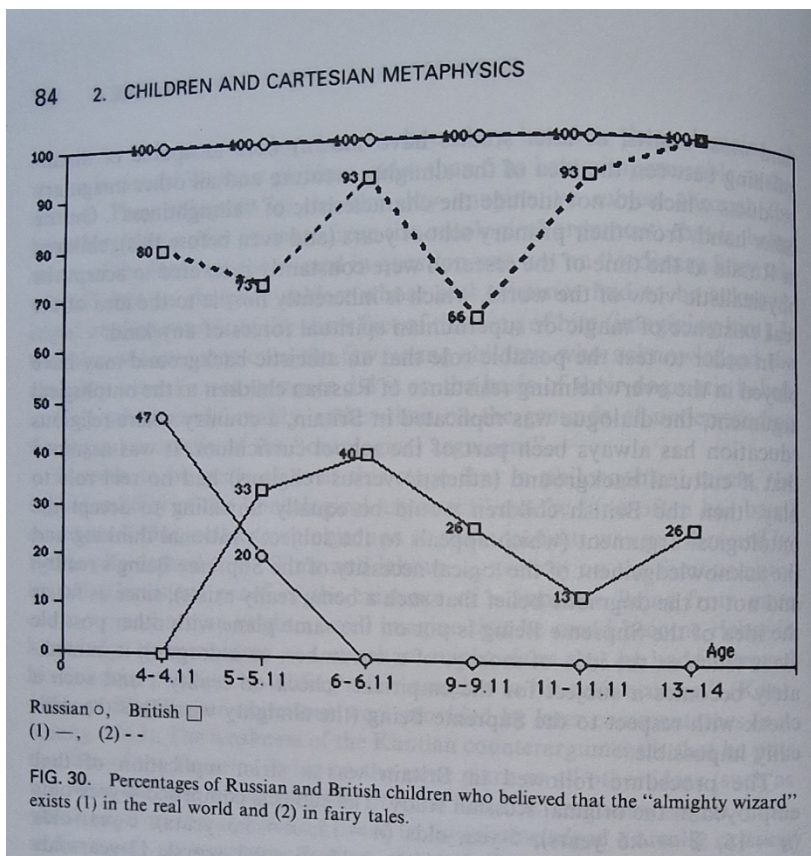
As the analysis of the answers showed, the resistance of the children to the 'ontological argument' were unlikely to be caused by the children's insensitivity to the key features of the argument, that is by the lack of awareness that there was a logical contradiction in their judgements; the discussions that the experimenter had with the children revealed quite clearly that although all school age subjects were quite aware of the contradiction, they preferred to accept the contradiction rather than to allow for the possibility of the almighty wizard's real existence.

This makes it more plausible to assume that the denial of this possibility was caused by a combination of two factors. On the one hand, the children (and most adults, as later studies have shown) were incapable of distinguishing between the idea of the almighty creature and all other imaginary products which do not include the characteristic of 'almightiness.' On the other hand, from their primary school years (and even before this) the children in Russia of that time were under a constant pressure of the physicalist view of the world which is inherently hostile to the idea of the real existence of magic or superhuman spiritual forces of any kind.

In order to test the possible role that atheistic background may have played in the overwhelming resistance of Russian children to the ontological argument, in Experiment 2 the

dialogue was replicated in Britain, in which religious education˙
has always been a part of school curriculum. It was assumed that
if the cultural background (atheistic versus religious conscious)
didn't play any role, then in British culture the children would
be equally unwilling to accept the ontological argument (which
appeals to the subject's rational thinking and the acknowledgement
of the logical necessity of the Supreme Subject's reality, and not
to the dogmatic belief that such a subject really exists) since as
far as the idea of the Supreme Subject is put on the same plane
with other possible ideas (such the idea of money, of a cucumber
or a dragon), it immediately becomes a subject for the empirical
'check on reality', and such a check with respect to the Supreme
Subject (almighty wizard) is theoretically impossible.

The procedure of the experiment in Britain strictly followed
the procedure employed in the original Russian study.
Subjects were four- year- old (mean age 4.5), 5-year-old (m.a.5.5),
6-year-olds(m.a.6.6), 9- year- old (m.a.9.3), 11-year-old
(m.a.11.9) and 13- 14- year- old (m.a.13.11) children with 15
children in each age group and with approximately equal numbers of
males and females. The results of the comparative study in Britain are
shown in Fig.30.

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Russian ○,   British □
(1) —,   (2) - -

FIG. 30.   Percentages of Russian and British children who believed that the "almighty wizard"
exists (1) in the real world and (2) in fairy tales.

A logistic regression model was run for age (4) and nationality (2) for Russian and British 6- , 9- , 11- , and 13- year- old children's answers to Question 7 and Question 10 separately. No main effects were found. This showed that there were no statistical differences between Russian and British children's answers about the almighty wizard's existence, with the overwhelming majority of children in both nationalities saying that the almighty wizard could exist in imagination but could not leave its bounds.

This would suggest that both British and Russian children conceived the almighty wizard as an imaginative and not real creature. Among British children there were only two (one 4-year- old and one 9-year-old) who acknowledged that the almighty wizard could come out of our minds into the real world the result that was in concordance with the results of the Russian study, apart from the fact that Russian 4-year-olds were significantly more often inclined to admit the real existence of the almighty wizard than were their British peers the result that can be allegedly explained by a relatively greater popularity of themes about wizards and magicians in Russian folk tales for small children in comparison with those in British folk tales.

As the replication study in Britain , unlike the original Russian study, did not involve a subsequent discussion of the logical contradictions in children's judgements, the fact that there was a somewhat lesser number of British children than Russian children who would acknowledge the almighty wizard's capacity to come out of our minds into the real world could have been a consequence of this methodological difference. To account for this possibility, another replication study was conducted in the UK. Seventeen 6- year- old children (eight girls, with age range⋅ 6.1 to 6.9, mean age 6.5; and 9 boys, with age range 6.2 to 6.10 and m.a. 6.4) and sixteen 9-year-olds (eight girls, age range 9.0 to 9.10, m.a. 9.2, and 8 boys, age range 9.1 to 9.7 and m.a. 9.4) participated in the study as subjects. All of the children were native English speakers and attended a suburban school in the North West England.

In this second replication study, unlike in the first one, questions that were asked British children were slightly modified in order to avoid ambiguity that was present in some of the original questions. They were as follows:

Preliminary questions:

1. Would you mind if I talk to you a bit about wizards?

2. Tell me is there in the world a man or a wizard who knows everything and can do anything he wants, yes or no?

3. Can such an almighty wizard exist in a fairy tale, yes or no?

4. Can this wizard create a mouse, yes or no?

5. Can this wizard create a planet like Earth, yes or no?

If all these questions except for question 2 were answered positively, key questions followed. If not, preliminary questions were repeated in a different form in order to obtain positive answers; if the child insisted on denying the existence of a fairy tale wizard, he or she was excluded from further participation in the experiment.

Key questions:

1. Tell me, is it possible to think of such a wizard who is so powerful that he can even go out of your thinking and into the real world, for example, into this room, yes or no?
(if the answer was 'no', the additional question was put 'Can we talk about such a wizard?')

2. Let us think (talk) about such a wizard right now, O.K.? Does he exist in your mind while you are thinking of him (in our conversation while we are talking of him), yes or no?
(if the answer was 'no' the experimenter repeated the question in a different form trying to persuade the child that everything we are thinking or talking about exists in the form of thoughts or words).

3. Well, but as this wizard is so mighty and he exists in your mind (in our conversations) can he now go out from your mind (from our conversation) in this room and sit down in this chair, yes or no?
(if the answer was 'no', an additional question 'Why?' followed with the purpose to collect the reasons the child could bring about to support his or her refusal to allow the almighty wizard to come out of the mind; if the answer was 'yes', the question followed 'then why can't I see him?' with the aim to ascertain that the child's positive answer was sensible and conscious and with the expected answers being somewhat like 'He doesn't want to go out', 'He might be invisible' or 'He might be hiding somewhere in the room').

The results of this modified study (see the comparisons between Russian and British children in Fig. 31) showed that although a significantly larger number of English 6-year-olds than English 9-year-olds acknowledged for the possibility of the wizard coming out in the real world ($\chi 2= 4.497$, $p<.05$) the differences between the answers of Russian and British children of the same age groups were not statistically significant. This confirms that it is in the age between 6 and 9 years that children in both cultural groups started resisting the idea of the almighty wizard's real existence.

FIG. 31. Percentages of Russian and British children who acknowledged that the "almighty wizard" who existed in their imagination could materialise in the real world, with the remainder denying that this was possible.
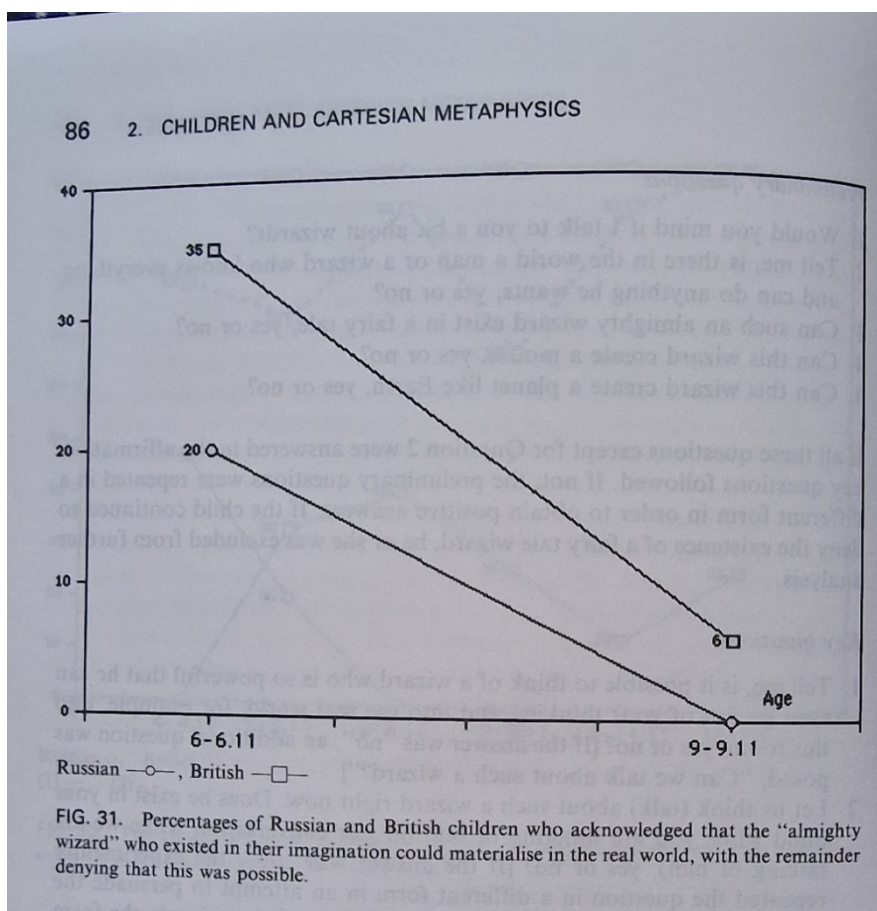
The reasons English children gave for their denial that the wizard could come out of their thinking were similar to those given by Russian children ('because he is not real', 'he is not really here, he is in our minds, I can only think about him', 'because a spirit can't go out of person's mind', 'he is almighty only in my brain, but he is not so almighty to go out of my brain'). Those seven 6-year-oldsand one 9-year-old who acknowledged for the possibility of the wizard coming out in the real world explained the fact that there wasn't any

wizard present in the visible form by saying that 'you can't see him', 'he might be invisible', 'because he is a ghost, and ghosts can't be seen', 'he's gone somewhere' the grounds very similar to those given by Russian children in the original study.

The results of the replication study did not support the expectation that the resistance to the possibility of the almighty wizard's real existence in Russian children might have been caused by their predominantly atheistic cultural background; as it can be seen from the data, English children were equally unwilling to except the possibility. An alternative possible explanation for this unwillingness is to assume that children view the almighty wizard as a fantastic creature from the world of fairy tales and do not distinguish it from other imaginary objects whose existence is confined to the limits of the imaginary world; if this was the case, then the characteristic feature of the almighty wizard i.e., it's almightiness what is a sufficient condition of its real existence was not meaningful enough for children to have any impact on their judgements. It may be expected, however, that if adult subjects, instead of children, were asked the same questions, they would appreciate that the almighty wizard they are being asked about is a metaphorical way of talking about the Almighty Subject and not a 'fairy tale' character in its literal meaning.

To examine this possibility, the same set of questions was put to adult subjects. Eight men (age range 19 to 23, mean age˙ 20.8) and nine women (age range 18 to 27, m.a. 21.3) who were Lancaster University students participated as subjects in this study. The questions asked were the same put to English children, however, if the negative answer was given to the final key question, the experimenter draw to the subject's attention the fact that there seem to be a logical contradiction between the statement that the wizard was almighty and that he/she could not yet go out of the mind. After this, two additional questions were put to the subject: 'Do you agree or not that there is a logical contradiction in what you have said?', and if the answer was 'yes', 'Do you prefer simply to accept this contradiction, or you would like to reconsider your opinion on that the wizard is unable to come out of your mind and into this room?'

The objective of these questions was to emphasize a major strength of the ontological argument, i.e., the fact that the almighty subject, once it is acknowledged that he/she exists in any form (even in the form of an image or a spoken word) has to be ascribe real physical existence too. If the subject cannot see the necessity of the link between the 'almightiness' and the 'real existence', then obviously, nothing more can be done about it. If, however, the subject does acknowledge this link

(and, therefore, the fact that his or her former denial of the almighty subject's capacity to come out of the imagination was based on a logical contradiction), he or she still had two options: either simply to accept the fact of the contradiction without changing his or her opinion on the almighty subject's existence, or to change the opinion and accept the conclusion that˙ the almighty wizard could, in fact, come out of his/her mind into the real world.

The results of the study showed that only one of the seventeen subjects (a man) acknowledged the fact of the wizard's real existence ('he is here, but we can't see him. He's not giving any light waves'), with all the others emphatically denying this. Out of these sixteen subjects eleven (five men and six women) didn't see a logical contradiction in their judgements, and five (two men and three women) said that there was a contradiction but they prefer to accept it rather than change their minds on the wizard's 'existential status'.

As the results show, the denial of the almighty subject's real existence was not a specifically children's way of reasoning but it was revealed by the overwhelming majority of adult subjects. Since it was unlikely that adult subjects simply took the almighty wizard for the fairy tale character (as it might have been the case with children) it became clear that there was one reason that made it very difficult (and in fact impossible) for most of the subjects to create a link between the 'imaginary almightiness' and 'real existence'. It was also clear that the reason was rather a psychological then a logical one; indeed, five adult subjects preferred to acknowledge and accept the logical contradiction in their judgements than to abandon their views on the impossibility for the wizard 'to come out of the mind'.

The question arose about what kind of reason it could be. In order to investigate that a special study with adult subjects was undertaken. There were four experiments in the study. The experiment described above was taken as a set up experiment (it will be referred to as Experiment 1). The experiment merely confirmed the fact that had previously been established in experiments with Russian and English children most of whom showed strong resistance to the ontological argument. Experiments 2- 4 examined the possible psychological causes of this resistance. The dialogue presented in Experiment 1 was reproduced in the end of every of the experiments as a control dialogue.

One of possible reasons of why most subjects refused to acknowledge the almighty subject's capacity to go beyond their thinking could be their viewing the fact of 'getting out of mind into the room' as a causal event in which the subjects' viewed their thinking as a cause and the almighty wizard as a

consequence. In so far as the almighty wizard is, by definition, much more powerful then are the children themselves, the subjects could have a feeling that they were pushed to acknowledge something unnatural and impossible, i.e., a succession in which a cause would create an effect that exceeded the cause immensely in all respects.

To prevent the possibility of this kind of feeling (or reasoning), in Experiment 2 a preliminary dialogue about the almighty wizard was run with the subjects and was immediately followed by the dialogue of Experiment 1. The purpose of this preliminary dialogue was to give the subjects indirectly the realization of the fact that it was not themselves who were supposed to be a creative cause if the almighty subject would 'go out of their minds'; contrary to that, it was in fact the almighty‧ wizard who might have 'settled down' in their minds in the form of their thinking (speaking) about him. With this being understood, the almighty wizard's 'coming out' of the subjects' minds would no longer be perceived by them as the 'inverted causal sequence'; rather, it should be viewed as the wizard's own action (i.e., the wizard's coming from the subjects' minds back to the external world from which he had originally entered their minds). If the reason of the resistance to the ontological argument in Experiment 1 was the subjects' ideas about cause- effect relationships, then in the end of Experiment 2 there would be more subjects acknowledging the wizard's real existence than in Experiment 1. The questions of the preliminary dialogue were as follows:

1. Now I'd like to talk to you something about wizards, o.k.? Have you ever head or red something about them? What have you head (red)?

2. Tell me, if a wizard is almighty, can he create a human individual, yes or no?

3. And can this almighty wizard create a person like yourself?

4. And can this almighty wizard create some thoughts in your mind, for instance, can he make you think about an almighty wizard, yes or no?

5. And what do you think, can this wizard, if he is almighty, turn‧ himself into your thoughts, enter your mind and settle down there, yes or no?

6. If this occurred, would you know that it was the wizard who settled down in your mind or you would think that it is yourself

who produced thoughts about this wizard?

If the answer to some of Questions 2- 5 was negative, the experimenter reassured the subject and tried to persuade him or her that the almighty wizard was indeed able to create somebody like himself or herself, to create his or her thoughts and even to settle down in his or her mind.

If a subject answered Question 6 'I would think it was myself who produced this thought about the almighty wizard', Questions of Experiment 1 followed.

If the answer was 'I would know that the wizard settled down in my mind', the question followed 'How would you find out about it?', and if the subject insisted on his or her view, he or she was freed form further participation in the experiment.

Six men (age range 18 to 30, mean age 22) and nine women (age range 18 to 21, m.a. 19.1) took part in the experiment. All of them acknowledged in a preliminary dialogue that it might have happened that the almighty wizard created thoughts about himself in their minds. One of the subjects (a man) answered positively to the question about the almighty wizard's capacity to come out of the subject's mind into the real world. Other subjects gave negative answers to this question; eight of them refused to see· any contradiction in their judgments, and six subjects acknowledged and accepted the contradiction without changing their minds. The justifications for the negative answers given by the subjects in this experiment were similar to those given in Experiment 1.

As it can be seen from the results, it was not the 'inverted causal succession of events' that deterred the subjects from acknowledging the real existence of the almighty subject.

Another possible psychological reason for the subjects' refusal to allow for the almighty wizard's capacity to come out of their minds could be the 'anthropomorphizing' of the almighty wizard by the subjects. It was possible to assume that the subjects viewed the almighty wizard as a humanlike creature who has a physical body and, therefore, it seemed odd to them to admit that a physical object like that could be 'materialized' by their sheer will power.

In order to prevent (or at least to weaken) the possibility of this 'physicalizing' of the almighty subject's image a special preliminary dialogue was run in Experiment 3. In this dialogue it was made clear to the subjects that the almighty wizard could be invisible and not necessarily human. If the reason for the 'nonadmission' of the almighty subject into the real world was the anthropomorphizing of the wizard's image by the participants then the number of subjects who would insist on their

denial of the almighty subject's real existence in this experiment must be significantly smaller than in Experiment 1.

The questions of the preliminary dialogue were as follows:

1. Now I'd like to talk to you about wizards, is that o.k.? Have you ever heard or red something about them? What have you red (heard)?

2. Tell me, please, is this necessary that wizards should look like human beings, or they can look differently?

3. Can a wizard be invisible, yes or no?

4. Can a wizard turn himself or herself in various animals and objects, yes or no?

5. Can a wizard turn himself/herself in the air or in the walls of this room, yes or no?

If a subject's answers to some of Questions 1- 5 were negative, the subject was immediately reassured by the experimenter who reminded him or her passages from books and fairy tales (like 'The lamp of Alodine') showing that a wizard could in fact take any shape and look differently from humans, be invisible and into various objects. Then the final question followed:

6. So, if the wizard is almighty, he/she is not necessarily visible and can be hiding himself/herself in various objects in this room, yes or no?

If the answer was 'yes', questions of Experiment 1 followed. Eight men (age range 18 to 23, m.a. 20.1) and ten women (age range18 to 22, m.a. 20.9) participated in this experiment. All of them acknowledged the wizard's capacity to take shape of various objects and be invisible. Three of the subjects answered 'yes' to the question about the wizard's capacity to come out of their minds into the experimental room; they justified the apparent absence of the wizard in the room by the wizard's wish to remain invisible or be 'elsewhere'. Out of 15 subjects who denied the wizard's capacity of becoming real (giving arguments similar to those given by the subjects in Experiment 1) seven subjects did not see any logical contradiction in their judgements, and eight subjects did see and accepted the contradiction without changing their minds about the wizard's inability to come out into the real world.

Obviously, the results of Experiment 3 did not differ significantly from those of Experiment 1. This suggests that it

was not the almighty wizard's anthropomorphizing that prevented subjects from acknowledging the wizard's real existence.

Finally, there was one more psychological factor that could compel the subjects to deny the possibility for the almighty wizard to come out of their minds. This factor could be the awareness by the subjects of the impenetrable borderline existing between mental and physical realities. Indeed, as it has been shown in experimental psychology (see Subbotsky, 1991 for the review) a person who believes in permanence of physical objects has to maintain certain rules, and in particular the 'noncreation˙ rule' which states that a nonphysical object like thought, mental image or spoken word cannot turn into real physical object without certain conditions to be observed (like a subject's having some 'primary matter', tools and applying special efforts to the matter with the aim of creation the object).

Since the almighty wizard was given initially as an imaginary creature existing in the subjects' thinking, the subjects could simply view it as any other imaginary object (like an imaginary car or a 'flying source') and apply the 'noncreation rule' to it.

This hypothesis can gain support from the fact that, according to our data, a systematic denial of the ontological argument by the overwhelming majority of children appears in the age between 6 and 9 years, and it is exactly in this age that the idea of object permanence if finally established in children's minds on the level of representational intelligence (Piaget, 1986).

In order to investigate this hypothesis Experiment 4 was conducted. In this experiment each subject was demonstrated (individually) a phenomenon (a trick) in which an object conjured up by the subject would spontaneously turn into a real thing. In our previous studies (see Subbotsky & Trommsdorff, 1992) this trick proved to be quite efficient in weakening children and adults' beliefs in object permanence. If it was the belief in object permanence that prevented subjects from acknowledging the possibility for the almighty wizard to come from their imagination into the real world, then after this belief was shattered in Experiment 4 the number of subjects like that would considerably˙ decrease. The procedure of this Experiment was as follows.

A subject was invited in the experimental room in which there was a table and an empty wooden box 15 x 11 x 11 cm. with an open lid. The box was constructed in such a way that, if the lid is closed, a metallic plate would separate from one of the inside walls and sink to the bottom silently revealing a postage stamp that was place earlier between the plate and the wall of the box. A special construction of the lid and a system of magnets incorporated in the side and bottom of the box ensured that the

box could be manipulated with (i.e., turned upside down) without
giving up the secret of its construction.
The experimenter asked the following questions:

- Now I'd like to show you something. Tell me, if you imagine some
object, for example a nice postage stamp, and if you want this
stamp to appear here on the table, will it appear or not? Why?
Now, please, have a look in the box and see whether it is empty.
The experimenter then asked the subject to close the lid of
the box. Next to this he put a nice postage stamp on the table and
continued:
- Tell me, please, if you conjure up this stamp in your mind very
strongly and want this stamp to appear inside this box, will it
appear or not?
Next to the answer covered the stamp with a sheet of paper
and said:
- Now let's try it. Please, try and conjure up this postage stamp
in your mind and wish as strongly as you can this stamp to appear˙
in the box, o.k.?
- Now, please, open the box.
When the subject opened the box, he or she would find the
postage stamp inside. The experimenter answered the subject's
questions without revealing the secret of the trick, and then
asked the subject questions of Experiment 1.
Six men (age range 19 to 30, m.a. 21.8) and six women (age range 18- 21,
m.a.19.3) participated as subjects in this experiment. All of them
were noticeably surprised to see the imagined stamp to
'materialize' and asked for the explanation which was given by the
experimenter in a blank manner without giving up the secret of the
trick. In the dialogue that followed one subject answered 'yes' to
the question about the wizard's capacity to come out of their
minds, with the rest of the subjects emphatically denying this on
the grounds similar to those given in Experiment 1. When asked
about logical contradictions in their arguments, two of the
subjects (both were women) said that there were no contradictions,
five subjects (2 men and 3 women) confirmed that there was a
contradiction but refused to change their minds, and four subjects
(3 men and a woman) acknowledged the contradiction and changed
their minds saying that now they believed the almighty wizard
could come out of their minds. When asked about the reasons why no
wizard was available in the room four subjects said that the
wizard might be invisible ('He won't let us see him', 'He can't be
visible, but can be real'...) and one subject said that it was up
to the wizard's will when and where he would show himself.
As it can be seen from the subject's answers to the first˙
round questions about the wizard's real existence, the results of

Experiment 4 did not differ significantly from those in previous experiments. However, the second-round questions (that followed the subjects' judgements about the availability of logical contradictions in their arguments) detected a significant change in subjects' opinions: nine of eleven subjects in Experiment 4 acknowledged that there was a contradiction in their judgements and four of these nine subjects changed their minds on the almighty wizard's capacity to come out of their minds. A summary data for Experiments 1- 4 are shown in Fig.32.

FIG. 32. Percentages of subjects in Experiments 1–4 who (1) denied the existence of the "almighty wizard" in the real world during the first round of questioning, but who acknowledged that there was a logical contradiction in their judgements, and (2) acknowledged that it was possible for the "almighty wizard" to materialise in the real world during the first or second round of questioning.

Two logistic regression models were run for experiments(4) and sex(2) with acknowledgement of logical contradictions or acceptance of the ontological argument in the first or/and the second round questioning as dependent variables. They showed only marginal effects for experiments, with $\chi 2$ [3,N=56] = 7.478, p<.02 in the first model and $\chi 2$ (3, N=63] = 7.524, p<.02 in the second model.

However, when six logistic regression models were run in which data of each of Experiments 2- 4 was compared with the data of Experiment 1 (with acknowledgement of logical contradictions and acceptance of the ontological argument in the first or/and the

second round questioning being dependent measures), they showed that it was only Experiment 4 (but not Experiments 2 and 3) that yielded main effects. They were the main effect of experiment for the acknowledgement of logical contradiction ($\chi2[1, N=27]= 9.187$, p<.01 and main effects of experiment ($\chi2[1, N=29]= 5.662$, p<.05) and sex ($\chi2[1,N=29]= 4.616$, p<.05) for the acceptance of the ontological argument.

It means that only in Experiment 4 (but not in Experiments 2 and 3) a significant number of subjects were prepared to acknowledge that by denying the almighty wizard's existence they logically contradicted themselves, and only in Experiment 1 a significant number of subjects in the end accepted the ontological argument. It is noteworthy also that the main body of these subjects were those who changed their minds on the existence of the almighty wizard after they acknowledged that there was a logical contradiction in their judgements, and they were predominantly men.

This may suggest that it was the subjects' strong belief in object permanence (and not the 'inverted causal succession' or the 'anthropomorphizing' of the almighty subject) that was a major psychological impediment for the subjects to comply with the ontological argument. As soon as this belief was weakened, the shift in the subjects' attitude towards the ontological proof of the supreme subject's existence became apparent.

Firstly, this shift manifested itself in the fact that subjects became more tolerable to the fact that denying the almighty wizard's capacity to come out of their minds in fact contradicted to their previous statements about the subject's almightiness. However, as Experiments 1, 2 and 3 showed, this acknowledgement alone was not strong enough in order to make subjects reverse their final verdict about the almighty wizard's real existence. For this to become possible, the subjects needed some additional 'push', and this 'push' was provided in Experiment 4 by weakening the subjects' belief in object permanence.

If this was the case, then the fact of the coincidence between the age in which children's beliefs in object permanence are finally established on the level of representational intelligence and the age in which children start resisting the ontological argument (i.e., between 6 and 9 years) can be explained by the internal 'kinship' between the two phenomena. It is not necessary to assume, of course, that the belief in object permanence is consciously used by older children and adults to justify their refusal to accept the almighty wizard's capacity to come out of their minds. However, a strong feeling that an imaginary object can never become real 'on its own' and without special productive actions of the subject can definitely hinder

the 'logical power' of the ontological proof which simply does not work unless the object permanence belief is shattered. It is only when this belief is weakened, the subjects become susceptible to the logical appeal of the ontological argument.

Dialogue 7. The distinction between physical objects and subjective images they produce. Judgements about dreams and reality

Dialogue 7 was the last in the series and examined children's capacity to realize two major structures of the rationalistic world outlook: the fact that subjective images of objects are different from the objects 'in their own right' and the distinction between dreams and reality. The following questions were asked:

1. If you can see a red pencil and I will tell you that you have nothing in front of you would you agree or not?
2. If other people your friends, parents and grandparents would tell the same thing to you, would you believe this or not?
3. If you were told 'O.K., you can see the pencil, but this is nothing but your imagination, there is no pencil in front of you in reality' would you believe this or not?
4. And if you burned you hand by fire and it hurts terribly and somebody tells you that it doesn't hurt, would you believe this or not?
5. And if you were told the following: 'It does hurt but this only seems to you that you have you hand burned at fire, there was no fire in reality and the pain simply emerged in your hand on its own' would you believe this or not?
6. Look at this red pencil in front of you (the child is shown a red pencil lying on the table). Can you see it? Tell me, please, this redness of it, where is it in the pencil or in your brain (in your eyes)?
7. You know, there are people whose vision is damaged and they see this red pencil as colored in green. If you and such a person were looking at this pencil, it would seem red to you and green to the person. What color is it really and truly?
8. Let's imagine that a certain radiation permeated Earth from space and all people but you have had their vision changed by this radiation so that they will see the pencil green and you will see it red. What color is it really and truly?
9. So, can you tell me where the color in the pencil is or in your brain (in your eyes)?
10. And what about the heat that comes from the fire where is it situated: in the fire or in your brain (in your hand)?

11. Tell me if you pricked your finger with a needle and your finger hurts, where is the pain: in the needle or in your brain (in your hand)?

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12. So, you think they you are not asleep at the moment and everything that you can see and hear exists really and truly?

13. And why do you think that you are not asleep right now?

14. Can the following thing happen that it only seems to you˙ that you are in a vigilant state whereas in reality you are still asleep? Why?

15. Can you tell me how people whom you can see in your dreams differ from real people?

16. And how objects that you see in your dreams differ from real objects?

17. How do you know in the morning that you already woke up and are no longer asleep?

The link between subjective phenomena (i.e., images of physical objects, such as whiteness or redness, coldness or warmness, lightness or heaviness, etc.) and the external causes of these phenomena (i.e., objects in their own right traditionally described in special terms of physical theories, such as the field theory of colors, a molecular theory of thermal processes, a gravitational theory of mass and weight, etc.) can be regarded from various aspects. First of all, it was necessary to determine whether the children could allow for the possibility of the independent existence of subjective images without them being caused by certain external objects. If the child thought that such a break was impossible, it was necessary to further find out whether the child could really distinguish between the image of the object and the object in its own right and did not confuse between the two.

Lastly, the permanent link existing between subjective images and real objects that initiated them is a characteristic feature that distinguishes the real world (or, to put it differently, the˙ domain of the everyday reality) from the dreams where such a link is missing.

The results showed that the overwhelming majority of children acknowledged that it was impossible to have a subjective image of pain without any external cause being the cause of the pain ('No, I won't believe that there was no fire, pain cannot emerge from the thin air.' 'No, pain can't emerge on its own, you have to burn you hand or hit it.' 'No, I won't believe that there is not a real pencil in front of me, I can see it with my own eyes; if you took it away, I could conjure it up, but I won't be able to see it.').

Even among young preschoolers most children considered the

link between subjective images and their physical causes as necessary. The only exception was four schoolchildren who acknowledged that subjective images could exist without external objects being the cause of this ('This may be autosuggestion, I can believe that there is something which really doesn't exist.') (see Fig.33).

Children who believed that a subjective image of a pencil could appear without having been initiated by a real physical object (q. 3, —o—).
Children who acknowledged that pain could emerge without having been caused by an external physical object (q. 4, - -o- -).

FIG. 33. Percentages of children producing answers in response to Questions 3 and 4 regarding the possibility of subjective images not initiated by external objects.

Next to this was the question in which children's capacity to appreciate the role of sense organs (the brain) was examined. As basic subjective phenomena for the examination color (redness), warmth and pain were selected.

Answering question 6 ('Whether 'redness' belongs to the pencil's physical body or to the subject's brain) children produced three types of answers. All the preschooler (except one) and a considerable number of 1st and 3rd- graders were sure that 'redness' was allocated to the pencil ('The redness is in the pencil.' 'It is in the paint.' 'It is in the core.') (see Fig.34). In response to questions 7 and 8 aimed to point out indirectly to the children that perceptual organs play a certain part in the perception of color, all the children acknowledged that people

could see one and the same object as having different colours; at that, most of the children were sure that it would be themselves who would see the 'right' colour whereas the other person (or even all people on Earth) will be wrong. Even the prompting discussion in which the experimenter attempted to put the child's view under question, failed to provide the appreciation of the role of sense organs (the brain) in the perception of 'redness'. Here are two examples.

Tanija (a girl, 9 years)
      - The pencil will still be red because...it's their vision, it only seems to them that it's green, but in reality, it is red.
          - But they would think it is you who have the abnormal vision.
          - Well, then I could explain this to them.

Vasia (a boy, 7 years)
          - It'll still be red, you can't change the colour by words.
          - But the other people would think that it's you who sees the pencil to have a wrong colour.˙
          - Well, I will try to prove they are wrong.

      Other children acknowledged that colour sensation belonged to the subject's eyes (brain) ('The redness is in my brain...I can see it and know that it is red.' 'Perhaps, the redness is yet in the pencil...or in my eyes. Perhaps, it is in my eyes, because if this radiation hits my eyes they would see the pencil green.'). Lastly, there were children who thought that the redness was both in the pencil and in their eyes (their brains) ('Well, colour can be...in the pencil and in my eyes.' 'Well, it looks as though the redness is in my eyes...at first it is in my eyes, I can see it, but then when you start drawing it is in the pencil.' 'Redness is both there, in the pencil, and in my brain...there is redness in my brain because the pencil is red.' Basically, children who can appreciate the role of perceptual organs (two latter types of answers) become more numerous among 3rd graders and older subjects (increase, 7 years/1gr. to 13 years/7gr., $\chi 2= 6.8$, $p<.02$)(see Fig.34).

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Children who thought that a sensation of redness was in the pencil (q. 6, —o—), with the rest of the children thinking that the sensation of redness was in the subject's eyes (brain) or in the eyes (brain) and in the pencil together.
Children who believed that a sensation of warmth was in the fire (q. 10, --o--), with the rest of the children thinking that it was in a subject or in the subject and in the fire together.
Children who thought that pain was in the needle (q. 11, --o--), with the rest of the children believing that pain was in a subject.

FIG. 34. Percentages of children producing answers in response to Questions 6, 10, and 11 regarding links between physical objects and the subjective images they produce.

Similar types of answers were given regarding sensation of warmth. A different pattern, however, was revealed with respect to pain. Children who identified pain with the physical object (a needle) were found only among preschoolers and they were a minority (decrease, 4 years to 6 years, $\chi^2 = 9.18$, $p < .01$). Most 5- and 6- year- old preschoolers and all schoolchildren expressed˙ strong belief that pain was a product of the perceiving subject and did not belong to the object that had initiated it ('Pain is in me, because it's me who pricked my skin with a needle and not the other way round.' 'Pain is in me. The needle has only a sharp end, but it's me who has pain.' 'Pain is in me. There is no pain in the needle, it is not alive.'). In most children this appreciation of the subjective character of pain coexisted with projecting other subjective qualities (warmth and redness) into external physical objects. However, the experimenter's attempts to make the children to realize this as a contradiction in their judgements failed. Here are some examples.

Anija (a girl, 9 years)

- So, what is the difference between heat and pain? If, as you are saying, heat is in the fire, then pain must be in the needle too.

- No, the needle is made from iron, it can feel nothing, but human skin, and human flesh, and human blood can be pierced through and it hurts, it hurts.

Lena (a girl, 7 years)

- Look, heat too is felt by you in a similar way as pain is. Why are you saying then that heat is in the fire and not in your hand or in your brain?

- It is me who feels pain, because the needle doesn't know whom it pricked, it simply is sharp, but heat...it is in the fire.

Mitija (a boy, 9 years)

- Why do you think that heat is in the fire and pain is in you, what is the difference between heat and pain?

- Because heat...it is in the fire, if it were in me I would not exist, I would melt as steel in a blast- furnace, but pain it is in me because it it's me who pricked himself with the needle.

Gena (a boy, 11 years)

- Pain is in me, because the needle has pricked my skin, and I feel the pain, but heat...it is just warmth from fire.

- But pain too comes from the needle, doesn't it?

- No, it's me who was pierced by the needle and it is my finger where the pain is.

- And heat too is in your body and not in the fire.

- No, it is in the fire.

The borderline that the children draw between pain and two other subjective qualities was particularly obvious when a special 'imaginative experiment' was conducted with a selected group of children which included five 6- year- olds, six 9- year- olds, ten 11- year- olds and ten 13- year- olds. The experiment was designed as a continuation of the discussion that followed next to the children's answers to question 11 and included an imaginative situation. The children were asked to imagine Earth that was hit by a stream of harmful radiation from space which killed all living creatures people, animals and plants. The children were then asked whether the pencil would stay red, the fire hot and the· needle 'painful' after the event. The experiment showed that the overwhelming majority of children confirmed that colour and warmth would remain whereas pain would disappear. Here are some examples.

Petija (a boy, 11 years)

- Tell me, if the harmful radiation killed all the living creatures on Earth, will the pencil still be red?
- Yes, it will.
- Will the fire still be hot, or it will not?
- Yes, it will.
- And pain will it stay on Earth or it will disappear?
- Pain will disappear.
- Why will it disappear?
- Because all people and animals will die.
- And what about redness and heat?
- Redness would stay and heat would stay too.

Anija (a girl, 13 years)
- Tell me, if all the living creatures disappeared on Earth, would fire still be hot?
- Yes, I think it would stay hot.
- And the needle would it still be painful?
- No, to whom would it be painful if there are nobody?
- So, if there are no living creatures on Earth, pain would disappear?
- Yes, it would, because there is nobody to experience it.
- And heat would disappear too, wouldn't it?˙
Heat?..In a human being it would, but on Earth it wouldn't.
For instance, there are nobody on Venus, and there still is 800 centigrade on there.

Misha (a boy, 11 years)
- Redness would stay or disappear?
- It would stay.
- And heat?
- It would stay too.
- And pain?
- It will disappear because pain can be experienced only by living creatures, and if they don't exist...
- And who can experience redness then?
- Redness is seen by living creatures too.
- And if they all disappear?
- Well, redness will stay anyway.
- But if pain would disappear, why should colour stay?
- Well, if living creatures disappear, there won't be redness for them anymore.
- And in general?
- In general, colour will stay.

Only three out of thirty-one subjects gave different kind of answers: too preschoolers said that pain too will stay on Earth
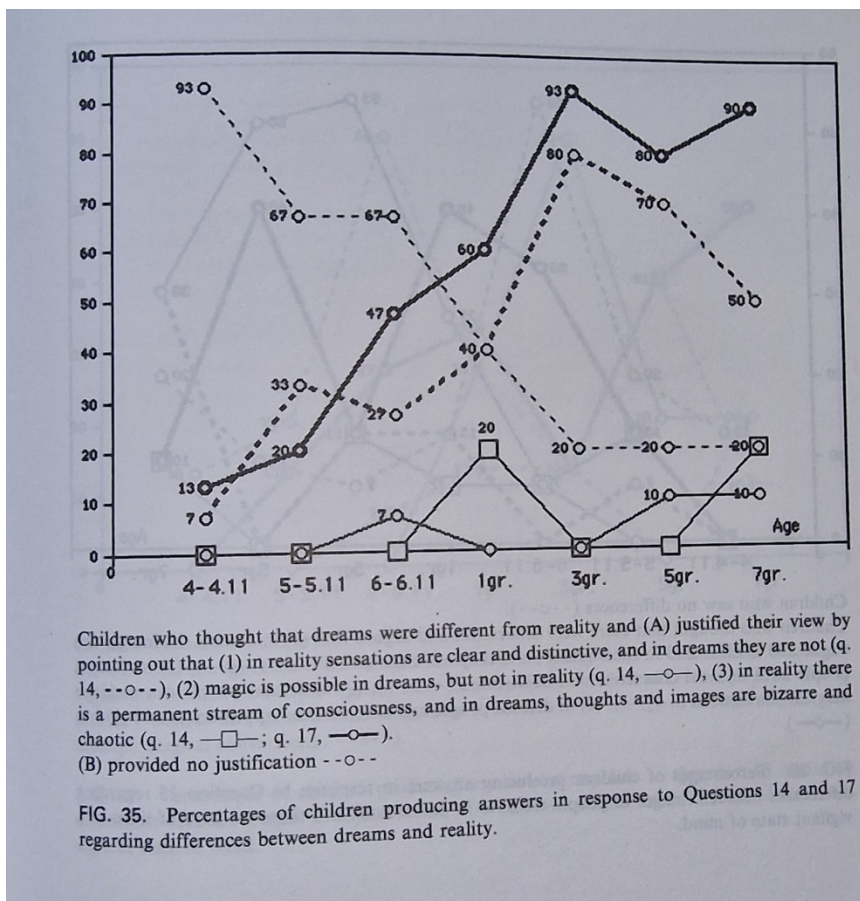
along with colour and warmth, and one 14- year- old boy thought that all the subjective phenomena would disappear ('Would pain stay or it would disappear? It would disappear. - And redness? It would˙ disappear too, because there would be nobody to see redness. - And what about heat? It'll disappear too, because there would be nobody to experience heat.').

The imaginative experiment showed quite clearly that redness and warmth were not considered by most of the children as subjective phenomena; in the children's view, they were identical to the physical causes that evoke them. Although many of the children may have not been acquainted with the physical theories of colour and thermal processes, they successfully replaced this gap in their knowledge by pointing out that redness is something that belongs to the physical body of the pencil and is, therefore, independent of the subjects who may experience it. The same was true with respect to warmth (which was almost invariably identified with temperature), but not to pain that was treated as a subjective phenomenon my most children older then 4. The discrepancy between the way the children perceived pain, on the one hand, and warmth and redness, on the other hand, shows that although the distinction between the physical cause and the subjective experience is quite accessible for most 5- year- old and older children, it is not transferred to such subjective qualities as warmth and redness, the fact that may have deeper roots in the structure of human perception of various modalities than the present study intended to trace.

Regarding the concluding part of the Descartes' procedure in which the comparison between dreams and reality is made, the results were as follows. Question 14 which prompted children to produce the criteria distinguishing dreams from reality yielded˙ four types of answers. In the first type of answers the children's strong beliefs in the existing difference between dreams and reality were not supported by any sensible justifications. In the answers of the second type (increase, 6 years to 9 years, $\chi2 = 6.57$, p<.02), the clarity of self-perception in the domain of everyday reality if compared with the lack of such clarity in dreams was put forward as a criterion ('It is not a dream now, because I am sitting here and can see... it does not only seem to me but I really can see my body, my dress and these books, toys, this heating radiator... In dreams something seems to me, for instance, I want to touch it and there is not this thing.' 'Because I can see only what really exists, and in my dreams, I can see things that do not exist and what I only think of.').
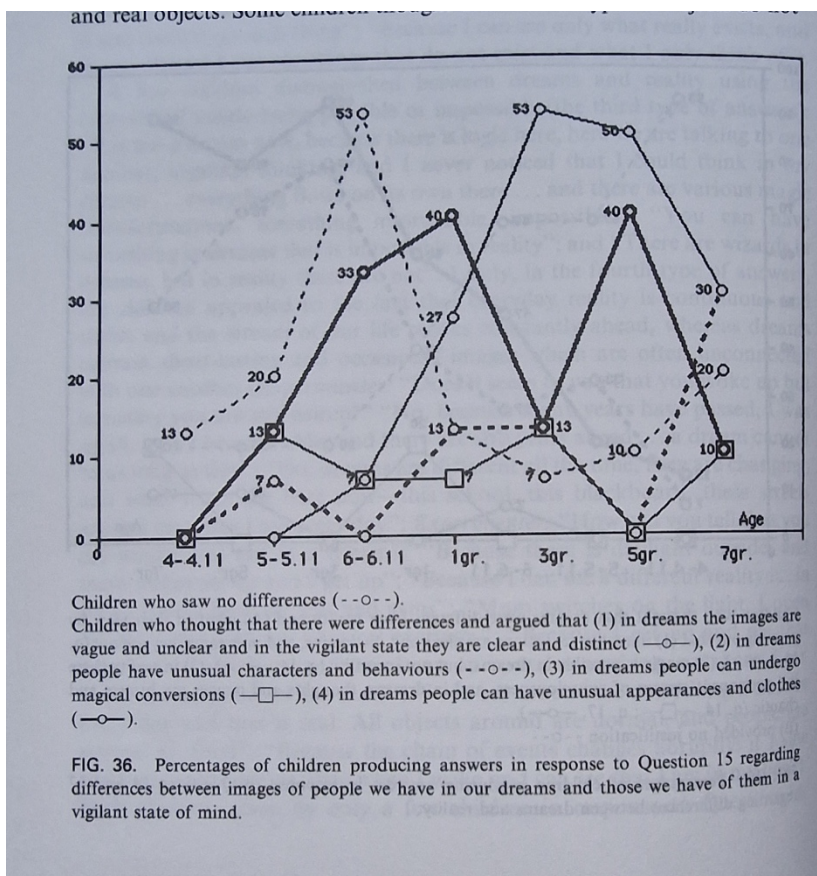
A few children distinguished between dreams and reality using the criterion of magic being possible or impossible (the third type of answers)('It is not a dream now, because there is logic

here, here we are talking to one another, arguing, thinking, and I never noticed that I could think in my dreams...everything flaws on its own there... and there are various magic transformations, something improbable, impossible.' 'You can have something in dreams that is impossible in reality.' 'There are wizards in dreams, but in reality, there are not.'). Lastly, in the fourth type of answers children appealed to the fact that everyday reality is a certain stable bed in which the stream of our life moves constantly ahead, whereas dreams contain short lasted and occasional images which are often unconnected one with another ('Can this be the case that it seems to you that you woke up but˙ in reality you are still asleep? No, because many years have past, I was small, then I became older and there are still years ahead...a dream cannot be as long as this.' 'No, dreams are different all the time, they are changing, and what I can see here now this school, this blackboard, these streets around this I see every day.' 'How can you tell that you are awake and not in a dream? Because there is daylight outside, and mama wakes me up and I get up.' 'Because I can see a different reality...in which books have no legs and arms.' 'Mum switches on the light, I open my eyes and go to make physical exercises.' 'Because I get up and see that there is this table here, with this lamp on it, and everything is real and I can touch the lamp and switch it off.' 'I can see around everything that I see every day and that is real. All objects around are normal, and people are normal as usual.' 'Because the chain of events changes abruptly: if I saw one thing in my dream, then when I wake up I can see that I am in my bed.'). This type of answers, given by only a few children in response to question 14 which encouraged children to find a theoretical distinction between dreams and reality, dominated in their responses to question 17 which was focused on the practical criteria the children use every morning to find out that they are awake (increase, 5 years to 11 years/3gr., $\chi2 =13.57$, p<.001)(Fig.35).

Children who thought that dreams were different from reality and (A) justified their view by pointing out that (1) in reality sensations are clear and distinctive, and in dreams they are not (q. 14, --○--), (2) magic is possible in dreams, but not in reality (q. 14, —○—), (3) in reality there is a permanent stream of consciousness, and in dreams, thoughts and images are bizarre and chaotic (q. 14, —□—; q. 17, —○—).
(B) provided no justification --○--

FIG. 35. Percentages of children producing answers in response to Questions 14 and 17 regarding differences between dreams and reality.
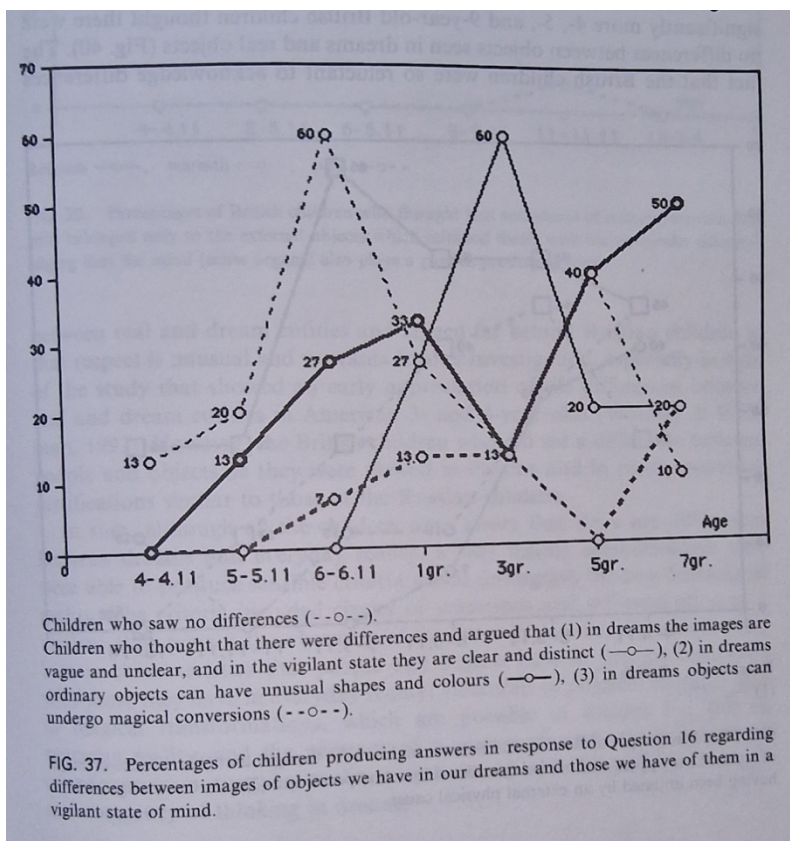
Responding to question 15 about the differences between images of people that they have in their dreams and those they have in the vigilant state of mind, some of the subjects denied that there were any. Those who acknowledged that there were some differences justified it either by to the stronger clarity of other people's images that they have in reality if compared to those they have in dreams ('Those people in dreams, they are hollow. What do you mean? Just that...I can only see them and imagine, that is all, and if I see a person and he has everything, then the person is real.' 'Those people in dreams, they are merely in my head, and these real people...they walk around...you cannot touch those people in dreams and these people you can touch them.' 'Those in dreams they have only silhouettes, but they have no bones, nothing.') or by the fact that people in dreams can have unusual character and behavior ('Sometimes you can see a person in your dream with a character from another person.' 'They can be different in dreams. For instance, we have a girl in the classroom who likes to be bossy, but in dreams she seems to be nice girl.'). One more group of children noted that dream people have unusual appearances ('A person may be old, but it seems in a dream

that he is still young.' 'Real people are nice, but in dreams they can seem ugly, with big noses.'Those in dreams, they are completely different, they may have an alligator's snout I had such a dream once they can have tails and long necks like in a giraffe.'). Lastly, some children said that in dreams people can˙ be subject to magical transformations (Fig.36).

Children who saw no differences (- -o- -).
Children who thought that there were differences and argued that (1) in dreams the images are vague and unclear and in the vigilant state they are clear and distinct (—o—), (2) in dreams people have unusual characters and behaviours (- -o- -), (3) in dreams people can undergo magical conversions (—□—), (4) in dreams people can have unusual appearances and clothes (—o—).

FIG. 36. Percentages of children producing answers in response to Question 15 regarding differences between images of people we have in our dreams and those we have of them in a vigilant state of mind.

Similar justifications were given regarding the differences between dream and real objects. Some children thought that both types of objects didn't differ at all, others noticed that dream objects have vague and hazy shapes and look unreal ('The objects in dreams disappear quickly, and real objects they don't disappear.' 'Real objects you can touch them, but in dreams you cannot touch them, your hand would go through them.'), still others pointed out that in dreams objects had unusual shapes, colours and appearances ('They can be of different colour at all, can have unusual shape. What I think about them they will take this shape, and real objects they are as they always are.').
Lastly one group of children said that in dreams objects can undergo magic conversions ('Well, in dreams you can put curse on

them, they can be of any shape.')(Fig 37).

Children who saw no differences (- -o- -).
Children who thought that there were differences and argued that (1) in dreams the images are
vague and unclear, and in the vigilant state they are clear and distinct (—o—), (2) in dreams
ordinary objects can have unusual shapes and colours (—o—), (3) in dreams objects can
undergo magical conversions (- -o- -).

FIG. 37. Percentages of children producing answers in response to Question 16 regarding
differences between images of objects we have in our dreams and those we have of them in a
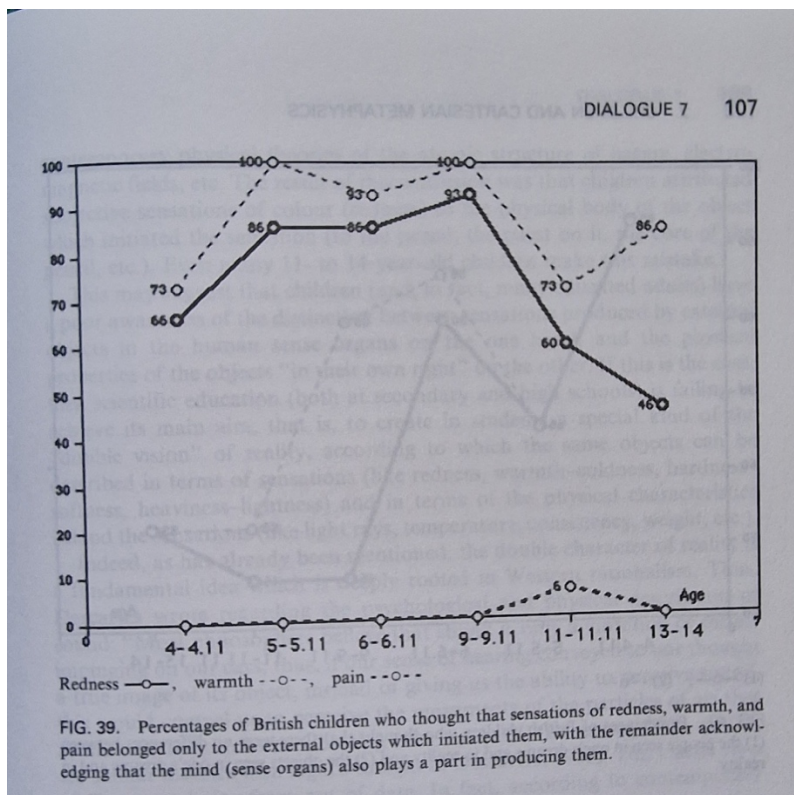vigilant state of mind.

The replication study in Britain showed that British 6-
and 9-year-olds were significantly more inclined to think that a
visual image could appear without an appropriate external
initiation than did their Russian peers, however, a number of this
type of answers significantly reduced in British schoolchildren
(Fig. 38)
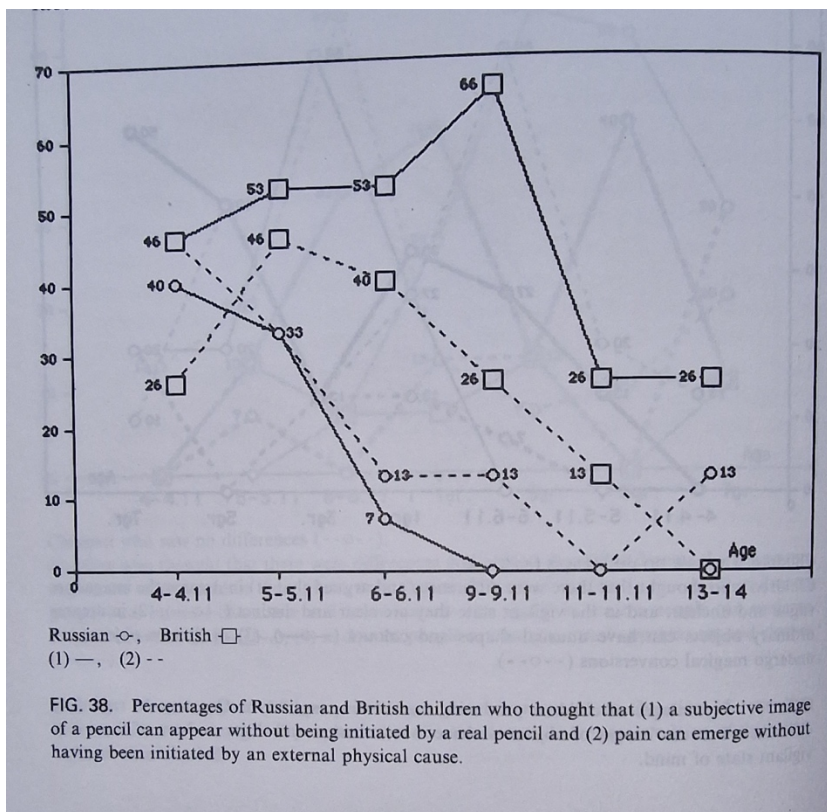
FIG. 38. Percentages of Russian and British children who thought that (1) a subjective image of a pencil can appear without being initiated by a real pencil and (2) pain can emerge without having been initiated by an external physical cause.
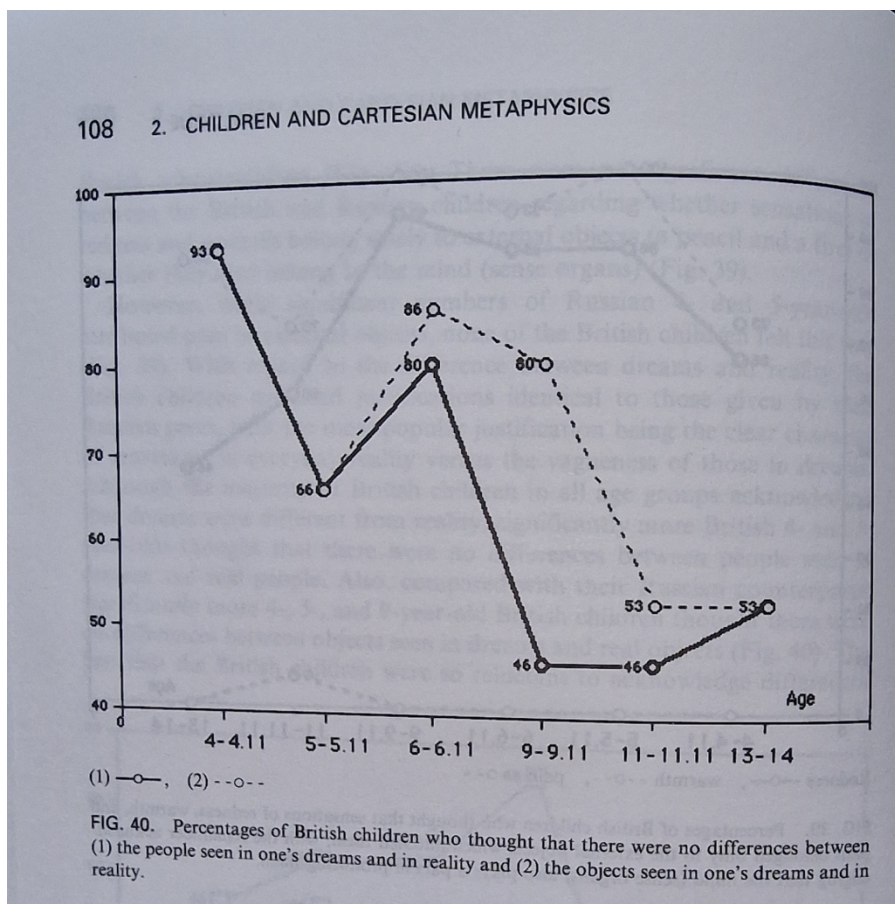
There were no significant differences between answers of British and Russian children on the questions about whether sensations of redness and warmth belonged solely to external objects (a pencil and a fire) or they also belonged to the minds (sense organs) (Fig.39)

FIG. 39. Percentages of British children who thought that sensations of redness, warmth, and pain belonged only to the external objects which initiated them, with the remainder acknowledging that the mind (sense organs) also plays a part in producing them.

However, while significant numbers of Russian 4- and 5- year-olds attributed also pain to the external object, there was almost
none of this kind of answers observed in British children (Fig.39). With regard to the difference between dreams and reality British children provided justifications identical to those given by Russian subjects, with the most popular justification being the reference to the clear character os sensations in everyday reality versus vagueness of those in dreams. Although the majority of British children in all age groups acknowledged that dreams were different from reality, British 4- and 5-year-olds significantly more often than Russian children of the same age groups thought that there were no differences between people seen in dreams and real people. The same was the case with regard to the differences between objects seen in dreams and in reality; this time not only 4- and 5- year- olds, but also 9- year- old British children more often said that they saw no differences than did Russian children of the same age groups (Fig.40). The fact that British children were so reluctant in acknowledging differences between real and dream entities and lagged far behind Russian children in that respect is quite unusual and warrants further investigation, especially in the light of the study that showed an early sophistication in appreciation of the differences between real and dream entities in American 3and 4- year- old children (Wooley &

Wellman, 1992).

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FIG. 40.   Percentages of British children who thought that there were no differences between (1) the people seen in one's dreams and in reality and (2) the objects seen in one's dreams and in reality.

Yet those among British children who did see differences between people and objects as they were in dreams and in reality provided justifications similar to those by Russian children.

In sum, although all the children were aware that there are differences between dreams and everyday reality, it was mainly schoolchildren who were able to produce sensible criteria which distinguish between the two domains of reality. The criteria included the clarity of sensations and self-perception in a vigilant state (versus the obscurity of the latter in dreams), the strange and bizarre characteristics that people and objects have in dreams if compared to those they have in everyday reality, the violations of physical causality through magical transformations which are possible in dreams but not in the everyday reality, and the presence of the permanent and continuous stream of consciousness in the everyday reality versus the absence of such permanence and constancy of thinking in dreams.

The results are in concordance with the study by Wooley & Wellman (1992) who showed that 3- and 4-year-old American children

could well distinguish between real and dream entities, viewing dream entities as private and non- physical in contrast to real objects which were viewed as public and physical. Among justifications that children gave there were those that referred to the different existential status of real and dream entities ('because it's real', 'because it's only pretended'). More than that, when asked about real entities ('an ant crawling on the ground') and fictional entities ('an ant riding a bike') most children of both age groups showed understanding of the fact that, in contrast to the everyday reality, dream can contain both real and fictional objects.

In general, if compared to the criteria put forward by Descartes, the criteria given by Russian and British children seem to be very close to the former ones, and at least no one of the children's criteria looks incompatible with the rationalistic view on the borderline between dreams and everyday reality that was outlined by Descartes.

As it can be seen from Fig. 34 and 39, most 4- to 9-year- old Russian and British children confused between subjective sensations of colour and the physical basis of colour perception whose concept is imbedded in contemporary physical theories about atomic structure of nature, electromagnetic fields, etc. The result of this confusion was that children attributed subjective sensations of colour (redness) to the physical body of the object that initiated the sensation (to the pencil, the paint on it, the core of the pencil, etc.). Even many 11- and 14- year- old children made this mistake.

This may suggest that children (and, in fact, many educated adults) have poor awareness of the distinction between sensations produced by external objects in human sense organs, on the one hand, and physical properties of the objects 'in their own right', on the other hand. If this is the case, then scientific education (both at secondary and high schools) fails to achieve its major goal, i.e., to create in students a special kind of the 'double vision' of reality, according to which the same objects can be described in terms of sensations (like redness, warmth- coldness, hardness- softness, heaviness - lightness') and in terms of physical characteristics behind the sensations (like light rays, temperature, consistence, weight, etc.).

Indeed, as it has already been mentioned, the doubled character of reality is a fundamental idea which is deeply inserted in the body of Western rationalism. Thus, Descartes wrote with regard to the psychological and physical types of description of sound 'Most philosophers believe that sound is only a vibration of the air impinging on our ears; thus, if our sense of hearing conveyed to our thought a true image of its object, instead of

giving us the ability to perceive sound, this would compel us to
perceive the movements of the particles of air that at the time
happen to be vibrating near our ears.' (Descartes,1957, p.174; see
similar theories with regard to light in Descartes' 'Optics',
Descartes, 1983). This classic view of Descartes is far from being
out of date. In fact, according to contemporary scientific˙
theories, a physical object is viewed as a complex entity
consisting of physical characteristics (Duncan, 1987; King, 1962),
whereas human sensations are interpreted as qualities produced by
the human mind and sense organs whenever they are affected by the
above mentioned physical characteristics of objects (Geldard,
1972; Wyszecki & Stiles, 1967).

      Yet, our results suggest that for most 4 to 9- year- old
children (and for many older ones) it seems that it is not their
sense organs and minds that produce sensations of 'redness, warmth
and hardness' but that it is the objects in their own right that
are red, warm and hard. This children's attitude is not to be confused with the famous
illusion of taking 'appearance' for 'reality' according to which an object possessing certain
subjective qualities (i.e., an apple made of plastic) can be mistaken for another object
which produces similar sensations but has different function and chemical compounds
(i.e., a real apple) (see Brain & Shanks, 1965; Taylor &
Flavell, 1984; Flavell, 1986).

      This confusion, however important it is for the creation in
a person of the feeling of the outer world's reality, nevertheless
contradicts to the scientific representation of objects as
combinations of physical bodies and fields. In fact, one of the
important implicit objectives of the scientific education is a
creation of this distinction between subjective and objective ways
of description of objects. Thus, in GCSE textbook on physics
(Duncan, 1987) light is described as light rays entering human
eyes, colour as a composition of light rays, sound as a kind
of vibrations that travel through the air to our ears and which we
can hear, weight of a physical body as the force of gravity
combined with the resistance of other objects, temperatures a˙
measure of the average kinetic energy of the molecules of a
physical body, and so on.

      In order to further examine this phenomenon, four experiments
were conducted in the UK that, unlike other studies reviewed in
this book, had analysis, rather than phenomenological description,
as their major aim and complied with the requirements of a
traditional statistically oriented study (Subbotsky, 1994).

      The objectives of Experiment 1
were to examine to what extent
six and nine- year- old children and adults were able (1) to
appreciate the fact that sensations that they have about objects

are produced by their minds (sense organs) and are not physical properties of objects, (2) to realize that all types of sensations (and not only some particular kinds of sensations) should be attributed to the human mind (sense organs) (3) to appreciate the role of the human mind (and not only human sense organs) in sensory processes.

Sixteen children in each of the two age groups and 16 adults participated as subjects. The younger group of children (8 boys with m.a. =6.4 and range 6.0 to 6.10 and 8 girls with m.a.=6.5 and range 6.1 to 6.9) and the older group (8 boys with m.a. =9.4, range 9.1 to 9.7 and 8 girls with m.a. =9.3, range 9.0 to 9.10) consisted of children of a mixed socioeconomic background recruited from a suburban school, and adults (8 men with m.a. =21.3, range 18 to 27, 8 women with m.a. =21.6, range 18 to 31) were students of Lancaster University.

A red pencil, a small bell, a piece of cotton dipped in perfume, a piece of chocolate, a metallic 1 lb. disc and a cigarette lighter were employed as materials.

The children and adults were questioned individually, and there were seven separate slots of questions. Each slot consisted of a few preliminary questions and two key questions which targeted one of seven sensations involved. Six of the seven slots of questions were accompanied by demonstrations of each of the sensations; the remaining slot concerned pain which was addressed only theoretically by asking a subject to imagine how he or she would feel at the moment when a doctor makes him or her an injection with a syringe.

For instance, with respect to colour the procedure was as follows. A subject was shown a red pencil lying on a table and asked preliminary questions 'Can you see this pencil?' 'What colour is it?' followed by key questions 'What do you think, this redness of the pencil, where is it: in the pencil or in your mind? (the order of the words 'pencil' and 'mind' was randomized) and 'What do you think, this redness of it, where is it: in the pencil or in your eyes?' (the order of the words 'pencil' and 'eyes' was randomized). In order to control the role of the order of the key questions, for half of the subjects the key questions were given in a reversed order.

The questions were put in such a way that the mind and sense organs were not presented as alternatives (i.e., they were put as alternatives to the object but not to one another) and yet it was possible to assess the subjects' preferences with regard to locating sensations mainly in the mind or in the sense organs.

The third possible variation of the localization question (is˙ redness both in the pencil and in the subject's mind or eyes) was not included in order to avoid providing the subject with an

opportunity of an escape from searching for a correct solution by simply going for a compromise. However, if the subject produced this type of answer spontaneously (what in reality happened very rarely) it was registered as a correct answer in which the role of the mind (sense organs) in producing sensations was appreciated.

Spatial terminology (Where is the redness, the ringing, the warmth, the hardness, etc.) was used in the study instead of the more precise and philosophically sophisticated type of wording (i.e., 'To which of the two realities does the sensation belong: to the reality of mind and senses, or to the physical structure of objects?'). This was done because the philosophically accurate wording would be inaccessible for most children and many adults. The wording selected, although metaphorical, was not, nevertheless, incorrect because for the layman's mind it is just through spatial terms that the distinction between psychological and physical realities is represented with psychological qualities (such as thoughts, sensations, feelings) being viewed as resting 'in the mind', 'in the head', 'in the eyes' and physical qualities (temperature, weight, light) being imbedded in the external objects. It was assumed therefore, that the spatial location employed in the questions (i.e., 'in the mind' or 'in the pencil') would stand for the distinction between the subjective and objective realities in a philosophically unsophisticated mind; it was further assumed that a child who allocated, for instance, warmth to the mind (or to the hands) rather than to the fire would· mean that warmth is a subjective rather than an objective (physical) quality.
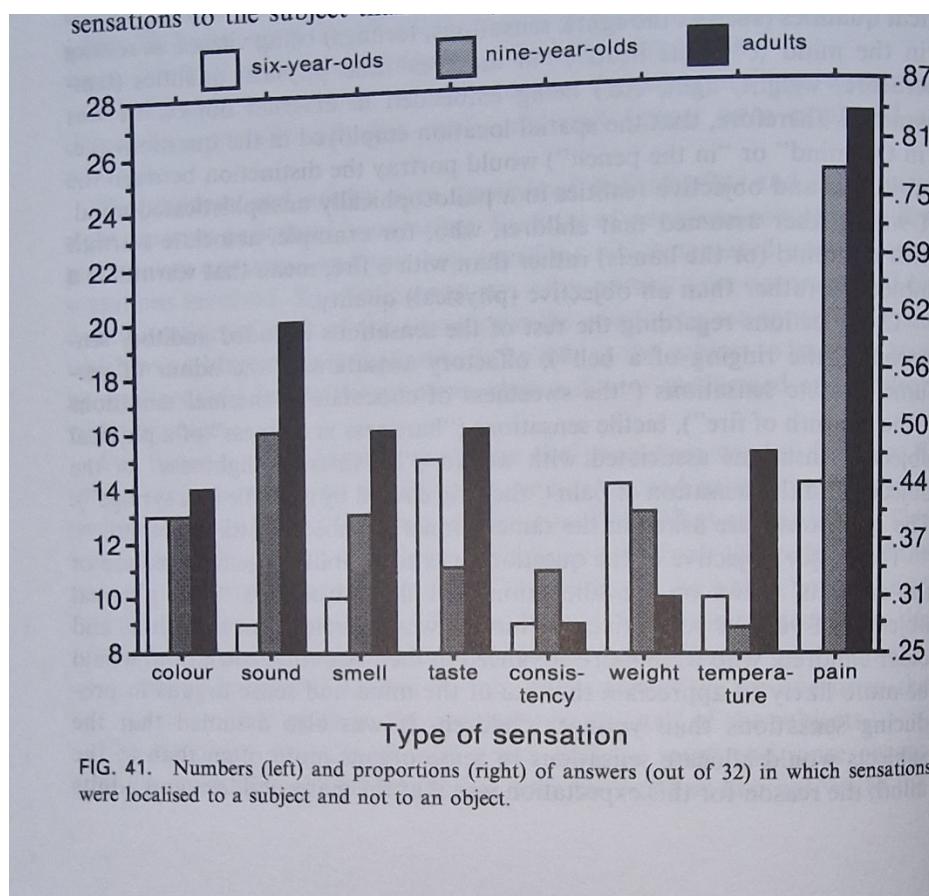
The questions about the rest of the sensations included auditory sensations ('the ringing of a bell'), olfactory sensations ('the odor of perfume'), thermal sensations ('the warmth of fire'), tactile sensations ('hardness vs. softness' of a physical object), sensations associated with weight ('heaviness vs. lightness' of the object) and sensation of pain ('the pain caused by a needle of a syringe). The questions were asked in the same way as with regard to colour sensation.

The major objective of the questions was to establish a general picture of the subjects' views on the allocation ('in the subject' vs. 'in a physical object') of various subjective qualities. It was expected that adults and older children who were more advanced in their scientific education would be more likely to appreciate the role of the mind and sense organs in producing sensations then younger children. It was also assumed that the subjects would allocate sensations to sense organs more often than to the mind; the reason for this expectation was that for many children and adults 'the mind' is kind of notion which is more obscure and vague than are the 'eyes' 'ears' and other sense

organs.

As a comparative study already showed (see Fig. 34 and 39) there wasn't a significant difference between Russian and British 6and 9- year- olds' responses found with regard to the allocation of redness to the external object or to the subject's mind (sense organs), with more than 70%of children in both cultural groups allocating redness in the external object.

With regard to other perceptual qualities, the number of children in the analytical study who showed the awareness of their subjective nature was also quite small (between 20% and 50% of the total sample) (see Fig.41).

FIG. 41.   Numbers (left) and proportions (right) of answers (out of 32) in which sensations were localised to a subject and not to an object.

A statistical analysis of British subjects' responses didn't reveal an overall age effect in subjects' tendency to allocate sensations to the subject rather than to the object. It means that adult subjects showed not a significant improvement in their understanding of the distinction between psychological and physical terms of object description if compared to 6and 9- year old British children (Subbotsky, 1994b).

There were, however, significant age changes found on certain particular scales. Thus, 6 -year-old boys showed a significantly stronger tendency to allocate sensations to the subject than did 6 year old girls; there were no such differences observed either in 9-year-old children or in adults. This can suggest two possible explanations. First, it might be assumed that 6-year-oldsboys are more sensitive to the distinction between subjective and objective properties of objects than are 6-year-old girls, and second, that 6-year-old boys can appreciate the role of the mind and sense organs in producing sensations to a greater extent than can girls. Both explanations appoint to the greater effect that elementary physical education has on 6-year-old boys if compared with that on˙ girls the differential effect that disappear in the older age.

The second major age effect was related to the preference that children of both age groups had for the attribution of sensations to human sense organs if compared with that to the mind. This result is in concordance with the expected one and indicates that children of both age groups viewed sense organs as a more appropriate locus for psychological attributes that they did the mind. The fact that such a difference was not observed in adult subjects may suggest that adults have a more adequate idea about what the mind is, as well as a better appreciation of the role the mind plays in sensation than have the children.

Although adults and 9-year-old children showed no clear improvement in the 'within subject' allocation of the sensations if compared to 6-year-olds there was, nevertheless, a certain indirect indicator of such an improvement. This indicator was the emergence of the differentiated treatment of various types of sensations by adult subjects who preferred to allocate the 'ringing of a bell', the 'odor of perfume' and especially the pain in the subject significantly more often than other types of sensations. The reason for this selective appreciation of the subjective character of pain is not yet quite clear. One possible explanation might be that pain is normally inflicted through a direct physical contact between the pain-causing substance and a subject's body (like the one employed in this study), whereas many other types of sensations (vision, hearing, olfactory sensation) are aroused by distant objects.

Yet, despite these indirect indicators of age related˙ progress, most subjects from all groups considered sensations to be immanent properties of external objects what obviously contradicts the image of the world given by modern science and reflected in educational programs and textbooks (Duncan, 1987). However, this contradiction is not stated explicitly in most textbooks for the beginners what provokes further explications on the matter in more advanced guides. Thus, in a book for students

who 'had excellent course in elementary college physics' definitions of temperature which involve physiological sensations of hotness and coldness are qualified as 'utterly unreliable' since 'a piece of iron may feel colder than a block of wood though the two are at the same temperature as determined by any one thermometer' (King, 1962, p.2). Instead, temperature is defined as 'that property of a system which determines whether the system is in thermal equilibrium with other systems' (op.cit., p.2). In the guide on colour concepts colour stimulus is defined as 'radiant energy of given intensity and spectral composition, entering the eye and producing a sensation of colour.' (Wyszecki & Stiles, 1967). With respect to other senses (hearing, taste, sense of pressure, etc.) similar distinctions between physical stimuli and sensations proper are made (Geldard, 1972).

This way of representing modern scientific knowledge is expected to destroy the child's initial naive identification between sensations produced by objects and the objects described in physical terms and induce in the child's mind the doubled picture of the world which consists of physical bodies and their subjective images. However, our present knowledge does not allow˙ to estimate to what extent the aforementioned separation really takes place in children's and adults' minds as a result of the scientific education.

To examine this, a series of intervention experiments was conducted in which the effects of various kinds of intervention on children's and adults' capacity to appreciate the difference between sensations and physical characteristics of objects were examined. The interventional strategies used were as follows: direct explanation (Experiment 2), cognitive conflict treatment (Experiment 3) and 'personal views conflict treatment' (Experiment 4).

In Experiment 2 the same subjects were involved who participated in Experiment 1.

Three types of sensations (colour, sound and smell) were selected from the initial sample involved in Experiment 1. Each subject was tested individually. The interventional session consisted of telling a subject a short story in which physical causes of the subjective qualities were described; the story was accompanied with a picture illustrating it.

Next to the story presentation the subject was asked to reproduce it by answering the experimenter's questions. If the reproduction was satisfactory, test questions were asked that were identical to the key questions in Experiment 1.

For example, with respect to colour sensation the procedure was as follows.

- 'You know, of course, that different objects have

different colours, don't you?˙ Now I'd like to explain to you how people can see colours, O.K.? Have you ever seen waves on the surface of water? You should know that each object produces a special sort of waves the light waves. Look at this picture (Fig. 42).
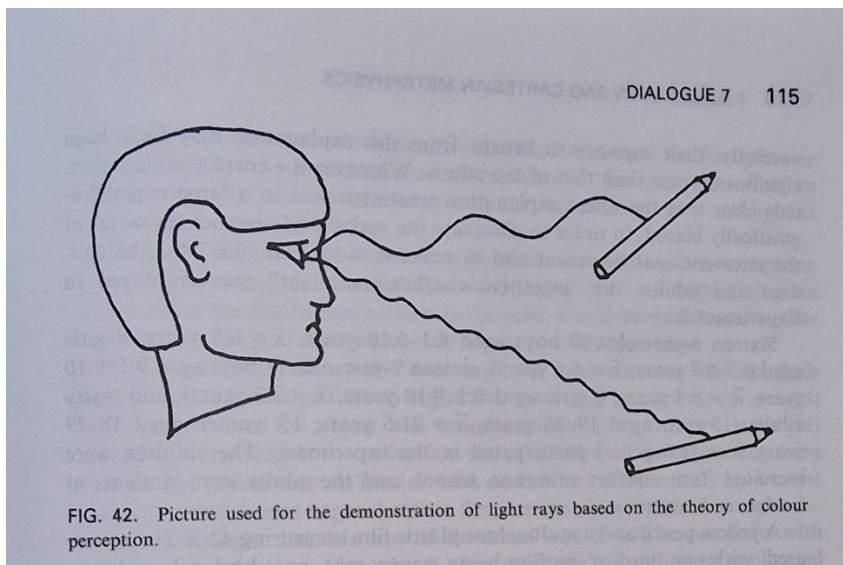

FIG. 42. Picture used for the demonstration of light rays based on the theory of colour perception.

These waves here they are. They are not colored themselves, but if they come into human eyes, people can see colours.
Now look. Some of the objects produce big and slow waves, the others produce small and quick waves. If big and slow waves come into our eyes, we can see a red colour, and if small quick waves come into our eyes, we can see a green colour'.

  After a few preliminary questions in which it was ensured that the subject understood the story correctly a set of key questions were asked as in Experiment 1. It was expected that if the treatment would affect the subject's tendency to identify sensations with the objects that produce them, then a number of subjects who make this identification in test questions after the interventional treatment would be significantly smaller than a number of subjects who made it before the treatment.

  The results showed that the direct explanation treatment has proved to be ineffective regarding 6and 9- year-old children, and only moderately beneficial for adult subjects who revealed a significant improvement with regard to sensation of smell after the interventional treatment but not with regard to colour or auditory sensations. Since the original numbers of adult subjects'˙ correct and incorrect answers in the pretest (see Experiment 1) were equal (16 to 16) and the change in the posttest affected only incorrect answers, this change cannot be explained by the mere

fact of the repeated questioning. Indeed, if the latter were the case and the subjects changed their opinions in the posttest merely because of the fact that they were repeatedly asked the same questions and thought their original answers were wrong, then the change should have affected both correct and incorrect answers. This was not the case, however, and the change was only unidirectional (that is, caused the transition from incorrect to correct answers only). This indicates that the intervention affected subjects in a selective way and the improvement of answers observed in the posttest should be attributed to the intervention as such and not to the fact of the test questions repetition.

The selective partial success of the direct explanation treatment with respect to adult subjects (and not to the children) can be explained by the fact that adult subjects were intellectually prepared to benefit from the explanation to a greater extent than were the children. However, an alternative explanation can be suggested according to which the adult subjects simply benefited from their superior linguistic capacities. Although children's answers to the check questions showed that they understood the story correctly, their capacity to benefit from this explanation could have been significantly lower than that of adult subjects. Whatever explanation is correct, it is clear that the direct explanation treatment was to a large extent a linguistically biased one.

In order to eliminate the verbal and abstract character of the interventional treatment and to make it more 'tangible' for children and adults the 'cognitive conflict treatment' was employed in Experiment 3.

Sixteen 6-year-olds(8 boys, with m.a. =6.8, age range 6.1 to 6.10, and 8 girls, with m.a. =6.5, age range 6.2 to 6.9), sixteen 9-year- olds (8 boys, with m.a. =9.5, age range 9.1 to 9.10 and 8 girls, with m.a. =9.3, age range 9.1 to 9.10) and thirty adults (15 men, with m.a. =21.6, age range 19 to 26, and 15 women, with m.a. =21.6, age range 18 to 29) participated as subjects in the experiment. The children were recruited from another suburban school, and the adults were students at Lancaster University.

A yellow pencil and a multicolor plastic film 42 cm. x 21 cm. were used, with one third of the film being transparent, one third red and one third blue. A metallic disc employed in Experiment 1 for testing subjects' judgements about sensations of weight and consistence, a heavy hammer and a 1 penny coin were also employed in this experiment.

Each subject was tested individually. The pretest procedure was identical to that in Experiment 1 for colour and weight sensations. In the intervention session which followed the colour

sensation pretest a subject was shown a yellow pencil placed first under the transparent part of the film, then under the red part (which made it look orange) and finally under the blue part (which made it look green). Each time the subject was asked what colour was the pencil. After the subject acknowledged that the pencil had· a new colour the following questions were asked: 'But you told earlier that the pencil was (the previous colour of the pencil was named). Have I painted the pencil in (the new colour of the pencil was named)?' 'If I didn't, is the pencil (the previous colour is named) and (the new colour is named) at one time?' 'If it is not, what is it's real colour?'

Independently of the subject's answers and immediately after the treatment he or she was given a posttest which was identical to the pretest.

Next, the 'weight' pretest was conducted. In this pretest (which was identical to the one for 'weight' in Experiment 1) the subject was given the metallic disk and asked whether it was heavy or light. Then the subject was asked whether the 'heaviness' ('lightness') was in the disk or in the subject's hand (mind). The order of the words 'disc/hand' and 'disc/mind' was randomized, and the order of the key questions (one giving the mind , and another giving the hand as an alternative to the disc) was reversed for half of the subjects. The pretest was followed by the intervention session, in which the subject was asked to keep the disk in one of his/her hand and a heavy hammer (which was many times heavier than the disc) in another hand. The question followed 'How do you feel the disc now: is the disc heavy or light? Is it heavier or lighter than the hammer?' 'But you told before that the disc was heavy, so can this be the case that the disc is heavy and light at one time?'.

Next, the subject was asked to replace the hummer with a 1 penny coin, and the same set of questions followed again, this· time highlighting the heaviness of the disc in comparison to the coin. The intervention session was followed by the posttest which was identical to the pretest.

The assumption behind this interventional treatment was that the clash between the knowledge that an object can only have one kind of colour and weight and the fact that the object was actually, changing its colour (weight) would make the subject realize that the properties of the object he or she was being asked about were some kind of illusions and, as any illusion, belonged to the subject's mind (sense organs) rather than to the object in its own right.

As far as this kind of treatment could only be a success in the case that the subject had the idea about the constancy of object's physical characteristics in contrast to the changeable

and situation- biased nature of sensations, it wasn't expected that the procedure would affect 6-year-old children who were unlikely to have this idea. However, there were reasons to believe that 9-year-old children and adults might benefit from the intervention. Indeed, according to some studies (Piaget, 1952, 1973; Light, 1986), 6-year-old children are not yet proficient enough in distinguishing between situation- biased properties of objects (such as, for instance, shapes of liquid substances) and their constant physical characteristics (such as the amount of liquid), whereas children older then 7 (and of course adults) are quite aware of the distinction. Since colour and weight of a physical object belong to its stable characteristics, the demonstration of their change might make the subject think that it˙ was not the physical basis of colour and weight but rather their subjective (and changeable) 'prints' that he or she was asked about.

As in Experiment 2, in this experiment the intervention proved to have only partial effect: after the treatment adult subjects allocated sensations of 'heaviness/lightness' to the subjects' mind (sense organs) significantly more often than before the treatment. As in Experiment 2, the change cannot be explained by the mere fact of test questions repetition since the change obtained was predominantly unilateral: there were 11 answers (out of 27 incorrect answers in the pretest) that were replaced by correct answers in the posttest, whereas only 2 answers (out of 33 originally correct answers) changed in the opposite direction, the difference between the two samples as assessed by McNemar's z- test for independent samples was significant ($z = 2.65$, $p<.05$).

The results, however, showed no indication that either 6- year-olds or 9-year-olds benefited from the cognitive conflict treatment, and the adults' tendency to ascribe colour sensation to the object didn't change either. In other words, the varying of the object's perceived colour and weight was not viewed by children (and with regard to colour by adults) as the proof of the subjective character of sensations.

A possible explanation of this failure is that the treatment didn't make an emphasis on the highlighting of the changeable and situational biased nature of sensations on the one hand, and on ˙ permanent and situation independent nature of physical characteristics of objects on the other hand, with an implicit assumption that this kind of knowledge had already been acquired by subjects. However, it might have been the case that the children and many adults lacked the idea that what is subject to changes and illusions must be necessarily ascribed to the subject's mind or sense organs; instead, the children and adults might have thought that physical characteristics of objects too could be transformed into illusory forms under certain conditions

(such as covering the pencil with a colored film). If this was the case, then acknowledging that a pencil could change its colour and the metallic disc could change its perceived weight was not viewed by the subjects as a sufficient ground in order to ascribe these variable characteristics to the subject's mind (sense organs) and not to the object in its own right.

In order to overcome this kind of confusion between 'changeable' and 'physical' characteristics of objects, Experiment 4 was conducted in which it was made clear for the subjects that those variations in characteristics of objects which were employed in the experiment could only be attributed to a subject's senses (subject's mind) and those physical prototypes which produced these variable sensations could only be permanent and independent of subjects' views or conditions.

To achieve this, the subjects were subjected to the 'individual views conflict' treatment in which one and the same object was perceived and measured by various individuals. In so far as this type of treatment involved intellectual strategies˙ that were unlikely to be present in children (such as comparisons between perceptions of various individuals on the one hand, and measurements made by the same individuals on the other hand) only adult subjects were involved in Experiment 4.

Sixteen subjects (eight men with m.a. =26.1, age range 20- 35, eight women with m.a. =27.1, age range 19- 58), all students of Lancaster university participated as subjects in this experiment. A yellow pencil and a metallic disc were employed as materials.

The same two types of sensations as in Experiment 3 colour and weight were employed in this experiment. The pretests were identical to those in Experiments 1 and 3. Next to the pretests the intervention procedure followed in which varying individual judgements about sensations received from the same objects were contrasted with the unanimity of judgements of the same individuals if the judgements were made about measured physical properties of objects. For instance, with respect to colour subjects were asked the following questions:

1. Do you know what makes you perceive this colour as yellow and not, for instance, as green or pink? The sense of this particular colour is produced by light waves with a certain length of the wave so that light waves which produce the sensation of yellow colour have different lengths from those that produce the sensation of red colour, o.k.? (Picture 2 is shown to the subjects during the explanation).

2. Now, do you know that there are people who have abnormal colour vision and either cannot see colours at all or see this yellow

pencil as green or pink one?

3. Now, if you and those people with abnormal colour vision were asked to measure the length of the light waves that come from this yellow pencil (Fig. 43a is shown) with a special physical device, would you all come to the same results or to different results?

4. Now, if you and those people were just shown this pencil (Fig. 43b is demonstrated) and asked what colour it is, would your answers be the same or different?

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(a)

(b)

FIG. 43.   Picture used to demonstrate the distinction between a physical measure of light wavelengths and the sensation of colour.
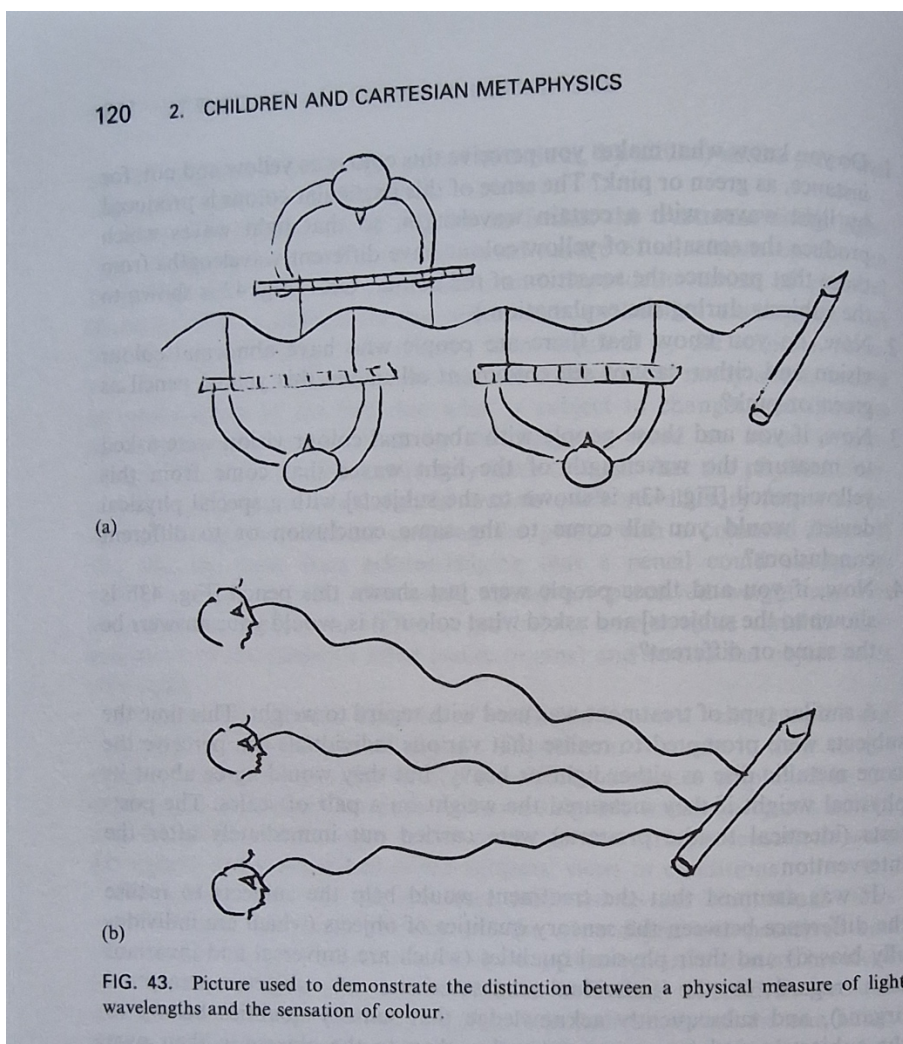
Similar type of treatment was used with regard to weight; this time the subjects were prompted to realize that various individuals can perceive the same metallic disc as either light or heavy but they would agree about its physical weight if they

measure the weight with the scales. The posttests (they were identical to the pretests) were given right after the intervention.

It was assumed that the treatment would make the subjects realize the difference between sensory qualities of objects (which are individually biased) and their physical qualities (which are universal and invariant with regard to the individual characteristics of subjects' perceptual organs), and subsequently acknowledge that sensory qualities belong to the subjects' mind (sense organs) rather than to the objects in their own right.

The 'individual views conflict' treatment proved to be more effective than either the 'direct explanation' or 'cognitive conflict' kinds of intervention with respect to colour sensation for which a major effect of intervention was found. In so far as it concerned other sensations however, the effect was weak and only approached significance with regard to the sensation of weight. This may suggest that for some reason it was more difficult for the subjects to realize that 'heaviness' and 'lightness' are properties of the object which are different from the object's physical weight than to acknowledge that 'yellowness' or 'redness' could be various subjective manifestations of one and the same kind of light rays. No plausible explanation of this differential effect of the 'individual views conflict' treatment with regard to colour and weight sensations can be offered for the moment; obviously, the effect warrants further investigation.

One of the main results of the study was a constatation that there wasn't a significant improvement in the understanding of the subjective nature of sensations in adults if compared to 6and 9-year- old children. The result is not surprising if it is taken into consideration that there is no program of psychological education both in school curriculums and in most university curriculums (apart from psychology departments or departments related to psychology). The resulting effect is that the confusion between scientific and psychological terms of description of physical objects and events which is typical for young children remains largely intact as a person goes through the 'channel of scientific education.'

Thus, Lewin et al. (1990) reported that both schoolchildren and university students revealed poor knowledge of the fact that various parts of an object rotating around its axe don't move with the same speeds. Obviously, with respect to the distinction between subjective and objective modes of the objects' description the traditional school education does even less than with regard to the acquainting children with physical qualities of rotating objects, since the distinction between subjective and objective is often viewed as unimportant. However, even if the distinction is

indeed, unimportant in some areas of the everyday life, it becomes important if scientific education has to be put on a firm theoretical ground.

Nevertheless, the data of the study did reveal certain age-related differences. Thus, both 6- and 9-year-olds showed a tendency to localize sensations in the sense organs rather than in the mind, whereas adults did not. This can be viewed as a growing appreciation among adults of the role that the mind and thinking play in sensory processes. This appreciation can be a result of the broader knowledge that adults have about the functions of mind and 'high mental processes' which they can get both from popular scientific literature and from their empirical self-observation.

Various types of interventional treatment applied to children and adults with the aim of increasing their appreciation of the˙ distinction between subjective and objective terms of objects description yielded variative results. The direct explanation treatment applied in Experiment 2 proved to be mainly ineffective: the only effect was that of test for sensation of smell in adult subjects. Slightly more noticeable effect was that of the 'cognitive conflict' treatment (Experiment 3); however, in this study (unlike in Lewin et al. study ,1990, who reported cognitive conflict to be an effective mode of intervention) the effect was very limited; it only showed the improvement of adult subjects' judgements about the sensation of weight but not about the sensation of colour. The most effective treatment proved to be the 'individual conflict' type of treatment which, due to certain limitation of the procedure that would make it difficult to be applied to children, was applied to adult subjects only.

It can be seen therefore, that the direct explanation of the distinction between subjective and physical descriptions of objects which is most likely to be used in an ordinary classroom teaching has turned to be the least effective. This poor effect can be explained by at least two factors. Firstly, the illusion which causes the confusion between subjective and objective modes of object description is normally a very strong one and difficult to overcome by means of sheer explanation. It has to be noted, however, that the strength of the illusion varies depending on the kind of sensation, i.e., in adult subjects the illusion proved to be very strong with respect to the sensation of colour and it was completely absent with respect to pain. Secondly, the cognitive benefit of making the distinction between subjective and objective˙ ways of objects description is not that obvious: even some of professional psychologists might think that it doesn't actually matter whether the 'redness' or 'heaviness' are viewed as subject's sensations or as physical properties of objects.

Indeed, in ordinary life some kinds of sensations can quite

successfully represent their physical prototypes what makes a direct reference to these prototypes superfluous. However, in science this kind of confusion between subjective and physical terms of objects description can create many inconsistencies and paradoxes (see Subbotsky, 1993), and even in the everyday life the lack of proper understanding of this distinction can enhance in the individual the egocentric confusion between his or her feeling and views about certain objects and events and the objects and event as they 'really are.'

Moreover, it may be assumed that acknowledgment of the subjective character of sensations is not an isolated cognitive achievement of the individual but rather is a particular manifestation of a more general ability to catch the doubled character of reality in which almost every object exists in two separate manifestations: as a subjective image (a visible image of a cube, for instance) and as its rational construction (the same cube as a physical body with such unchangeable characteristics as magnitude, shape, molecular structure, etc.). Much of psychology has been devoted, for instance, to the examination of the development of understanding of rational constructions by children (for instance, the development of various types of conservation). One of the most obvious demonstrations of the doubled character of reality is the phenomenon of changing of the visual size of an object with its moving away from (or closer to) the observer. It can be assumed that the child can understand the doubled character of reality if s/he is able to acknowledge two things at one time: that an object becomes smaller when it recedes from the observer and that it remains the same at the same time (i.e., it retains its physical shape and magnitude)(not to be confused with the understanding constancy of shape and magnitude). In the light of this it would be interesting to examine in future research whether the children's capacity to distinguish between subjective and objective terms of reality description with regard to sensations would positively correlate with their ability to distinguish between other types of phenomenal images and rational constructions, such as objects' visible (versus real) shape and size.

Coming back to the results of the present study, it can be seen that the 'cognitive conflict' treatment (Experiment 3) too produced very moderate results. It was not until adult subjects were made to realize that individuals' sensations with respect to the same object could vary (the 'individual views conflict treatment in Experiment 4) that many subjects were prepared to acknowledge that 'redness' or 'heaviness' of objects were produced by subjects' senses (minds) and were not physical properties of the objects. Although limited, the change, nevertheless,

demonstrated that to a considerable degree human sensations are conventional and situation biased psychological units in contrast to physical properties of objects which are universal and˙ invariable. It was this contrast between situational biased nature of sensations and universality of physical properties of objects that our subjects have happened to be most sensitive to. This suggests that the 'socio-constructive' approach to human sensations and psychological functions can be a most powerful educational way of dealing with common illusions such as the confusion between human sensations and physical properties of objects that initiate these sensations.

Concluding Remarks: Children's reasonings on metaphysics of the world

The most general result of this part of study seems to be the fact that within the age range between 4 and 14 years the children acquire definite and sensible solutions to many metaphysical problems and many of these solutions are close to those given by Descartes.

Thus, at the beginning of the dialogues the children of all age groups produced a number of statements which they viewed as unquestionable and doubtless. The statements included the claim about the existence of the external world, the personal existence of the child, the adequacy of subjective images of objects to the objects in their own right, the existence of subjective experiences (visual sensations, sensations of pain and hunger) and their necessary links with the external objects that initiated them, the distinction between the everyday reality and dreams.

When encouraged to put the statements under doubt in the˙ course of the subsequent conversations most children agree that some of the statements can be viewed as unreliable. The first piece of knowledge to be stroked by skepticism is the probabilistic knowledge (the experimenter's statement that he has a cigarette lighter in his pocket) which is likely to be doubted even by most 5- year- olds; it is followed by the belief that our sensory images of objects are identical to what the objects are 'really and truly' (this was questioned by most 6-year-oldsand older children). Interestingly, skepticism about these types of knowledge was expressed even by those children who were unable to produce any sensible definition of true and false knowledge.

At a significantly later age the children acquire capacity to question some more stable and firm beliefs, such as the belief in that our images of objects (including images that we have of our bodies) correspond strictly to the objects as they are in their own right. With respect to the image of the body it was not until

the children reached 9 years of age that most of them accepted the idea that the shape of their bodies could be different from that they thought their bodies had ('May be, in reality I live on a different planet, and my body resembles that of an octopus.').

Regarding images of external objects, it was notable that even many 5-year-oldswere able to acknowledge that our sense images differ from the objects they represent (the Sun as we see it is unlike the Sun in its own right which is 'much bigger and hotter'), however, most of the children younger than 11 refused to accept the idea that subjective images may be totally different from what real objects are with general resemblance between the images and˙ the objects being viewed as the must.

There were, however, a few beliefs among the above mentioned ones that stayed doubtless for most children. They were children's beliefs in their personal existence, in the existence of the external world, in the existence of the children's personal experiences (sensations and feelings), in the fact that these experiences had been evoked (initiated) by some real external objects (a pencil, a fire, a needle). One special belief in this bunch was the belief that the almighty wizard could not exist in the real world.

All the subjects stressed their strong belief in their personal existence: more than that, most 6-year-oldsand older children were able to produce a proof of this which was similar to Descartes' 'cogito ergo sum.' According to this proof, being and thinking (imagining, doubting, having any of active conscious mental states) is one and the same thing, or. to put it differently, sheer awareness of having a certain mental activity by an individual is a necessary and sufficient indication of the individual's personal existence.

Somewhat later (around 7 years) most children come to the awareness of yet another fundamental rationalistic idea that there is the identity between existence and truth (truth is a statement about something that really exists, and false about something that doesn't exist). Approximately at the same time the children require the awareness that in order to ensure that a certain piece of knowledge is true it has to be checked through personal experience.˙

One more idea that seems to be unquestionable for the children within the age span involved was the idea about the inseparable unity between object and subject. It was manifested through the children's invariable refusal to accept that it was possible to doubt real existence of the external world (Where would I be if there were not the world?) and the existence of subjective phenomena (like pain, redness, warmth) without the existence of external objects (a needle, a pencil, a fire) that

initiated the phenomena. However, the capacity to justify this primary intuition doesn't appear until children reach 11, what is substantially later than the capacity of justifying the identity between existence and thinking (which appears in children around 6 years of age). This may suggest that the idea of the 'thinking - being' identity is more fundamental and intuitively obvious for the children than the idea of the 'subject- object' inseparable unity the fact that fits well into the 'subordination' between the fundamental ideas made by Descartes.

Another cardinal distinction that seems to be clear for most children, was the distinction between the everyday reality and dreams. The criteria produced by children stand quite closely to those given by Descartes.

In contrast to the aforementioned ideas, such an important element of rationalist metaphysics as the acknowledgement of the real existence of the almighty subject on the sheer ground of having the idea of such almighty subject seems to be totally alien to the overwhelming majority of children. Although some of the youngest subjects were quick in acknowledging the 'almighty˙ wizard's real existence, it didn't look as having been caused by the real understanding of the 'ontological argument'; rather, in their judgements the children were guided by their uncritical attitude towards certain fairy- tale characters whom they were easy to let into the everyday reality. However, all 6-year-oldsand older children emphatically denied that the almighty wizard could exist outside their imagination. The stubborn resistance the children revealed towards the 'ontological argument' can be explained by the combination of at least two causes.

The first cause may stem from a certain emotional resistance to the idea of the real existence of the almighty subject. Firstly, under the influence of education (especially in the culture with the strong atheistic traditions in education which Russian culture of 1980th was) to the end of the preschool age the children develop a strong distinction between the everyday reality and the unusual realities such as dreams and fairy tales (see Subbotsky, 1992) what prevents the fairy tale character (which, most probably, the 'almighty wizard' was for the children) from permeating the domain of everyday reality. Secondly, the traditional image of the wizard which comes from the folk and fairy tales depicts the wizard rather as a capricious despotic creature who is likely to violate the laws of nature than as a wise guardian and protector of those laws. All this makes the idea of the real existence of such an extraordinary creature highly undesirable for the children.

The second cause may have a cognitive, rather than emotional, underpinning. It is the incapacity of the children to get to grips˙

with the implications of the 'almightiness' of the imaginative subject. In contrast to all other possible imaginative ideas whose existence in our imagination is not sufficient for them to be acknowledged as really existing things, the idea of almighty subject, according to Descartes, cannot possibly be produced by ourselves and therefore bounds us to acknowledge the real (and not only imaginative) existence of the object (or subject) to which the idea refers. As a long history of attempts to overthrow the 'ontological argument' shows, understanding of the link of logical necessity between the idea of the Supreme Being and the Supreme Being's real existence has always been notoriously difficult. No wonder therefore that our subjects lacked this understanding too.

Yet a special analytical study with British children and adults (who proved to be as resistant to the ontological argument as were the children) showed that it was not cultural differences and not the misrepresenting the image of the almighty wizard for a humanlike creature that made the idea of the almighty wizard coming out of our minds so unacceptable for children and adults. In fact, the resistance had nothing to do with logical arguments but was engendered by psychological causes. Specifically, it was the subjects' strong belief in object permanence, i.e., in the impossibility for an imaginative entity to spontaneously acquire real (physical) existential status, that was a major obstacle for the acceptance of the ontological argument. Only when the belief in object permanence was weakened in a special experimental condition a significant number of subjects were prepared to accept the ontological argument. ˙

Lastly, one more fundamental distinction of European rationality that has been evolving in children's minds during the age span involved was the distinction between mind and body. At the beginning (at the age of 4 or 5 years) there categories are often confused by children. As far as the body and its attributes (shape, spatial location, weight, nourishment, accessibility to sense organs, divisibility, etc.) are more tangible reality for the children than are mental attributes (thinking, imagination, etc.) it is these former attributes that attract children's attention most of all. For many preschoolers something is real only if it can be perceived through senses, whereas psychological entities like 'I' and thoughts simply 'don't exist.' While being aware of the body's attributes, most children of 4 and 5 relate them not to the body only but to the psychological entities as well. It is not until the children reach 6 years of age that psychological phenomena become free from most physical qualities.

One more important feature by which the children distinguish between body and mind was their belief in the independence of psychological entities ('I' and thoughts) from the body; this

belief becomes obvious in children in between 4 and 6 years of age and is manifested in children's statements that illness or physical injury doesn't affect 'I' and thoughts although the former can be reflected in the latter. Even pain is not related to the class of mental entities by many children ('thinking can only think about the pain but it's the body that feels it'). Lastly, in the school age many children develop a purely rationalistic idea about the individual having a direct access to his or her mental. entities which are, therefore, easier to cognize than is the body which is not 'directly' open to the individual ('Thoughts are easier to study than is my body. My soul is somehow open to myself, I know my soul, and my body...it has yet to be studied.').

 The confusion between mental and physical properties that was a characteristic feature of thinking in 4and 5-year-oldsdoesn't mean that children of this age are aware of the inseparable unity which exists between the mind and the body of a real human individual. The controversial nature of the children's judgements was just this striking combination of ascribing physical properties to the mental entities ('I' and thoughts) on the one hand, and viewing them as totally independent from the body (that is, invulnerable for physical injury, illness and even death), on the other hand. This type of reasoning which was very close to the Descartes' idea of the independence of the mind from the body almost disappears among 9-year-oldsand older children for whom death of the body also means death of all mental manifestations of the individual. It may be assumed that the idea of the 'immortal nature of mind', which is a classic element of cartesian metaphysics (but can also be seen as incorporated in many religious systems around the world) is a consequence of confusion between conceptual and ontological planes of viewing the relationships between body and mind.

 With the onset of the physicalist theories and views which are part of the European school education, the ontological plane of the body/mind relationships becomes more salient for most children who gradually abandon the view of the individual mind's immortability.˙ Thus, along with the typical rationalistic metaphysical ideas and solutions which appear in children of the age range involved as certain constant and permanent views, there were some solutions found which seemed to be ousted from the child's mind as the child grows older (the idea of the immortal nature of human 'I' and 'thoughts', the idea of the real existence of the almighty wizard). Although these solutions were naive and cannot be put on the same plane with similar ideas by Descartes (which were the result of sophisticated philosophical meditations), their meaning seemed to be very close to that proclaimed by Descartes.

At the first glance this looks quite strange and runs contrary to the theories that portray cognitive development as a steady process. However, a closer look at the structures mentioned above reveals that in the children they have either intuitive ('I' cannot die because it does not exist') or dogmatic ('The wizard lives in the forest') character which made them contextually quite different from the similar ideas by Descartes. With this regard, abandoning these beliefs at later age can look as a result of children's intellectual growth rather than a sign of weakening of the precocious 'philosophical capacity'. In order to approach the genuine understanding of the 'immortality of soul' and the necessity of the existence of the Supreme Being, these abandoned naive preconceptions have to reappear on the new basis of mature thinking and experience. According to the results of this study, this never happens in children within the age range involved, and, with regard to the idea of the necessity of the Supreme Being's existence, this is beyond understanding of the˙ great majority of adults.

There were also a few ideas in the 'cartesian bunch' which failed to appear even in children advanced in age. The limits of our subjects' reasoning manifested themselves quite obviously in children's strong belief that certain subjective qualities (warmth, redness) belong to the physical bodies of objects and not to the subject's brain or subject's perceptual organs. In a special analytical study this belief was proved to be true with regard to many other subjective qualities, and it was shared by Russian and British children as well as British adults. The application of special interventional methodologies showed that the confusion between subjective and physical qualities of objects was very strong and resistant to either a direct explanation or an indirect 'perceptual conflict' treatment. It was only under the 'social views conflict' treatment that this confusion was partially overcome in a considerable part of adult subjects.

Most children also failed to get to grips with the idea that names of objects are conventional and don't reflect the objects' physical properties.

The comparative study in Britain showed that, with a few exceptions, British children manifested all those phenomena that did Russian children, like the illusion of independently acquired knowledge, the allowance for the possibility of doubting the shapes that our bodies and external objects seem to have, the unquestionable belief in their own existence and the existence of the external world that were beyond any doubt, the growing awareness of the fundamental difference and yet inseparable unity˙ between body and mind. British children also provided justifications to their beliefs similar to those given by Russian

children. As Russian children , British children experienced the illusion that subjective qualities of objects (like redness or warmth) belonged to the external objects and not to subjects' minds(sense organs), they unanimously denied the possibility for the almighty wizard of coming out of our imagination into the real world. All this suggests that the development of metaphysical judgements in Russian and British children follow the same paths.

Of course, cultural differences did affect certain aspects of this development. Thus, an earlier beginning of the intensive school education in Britain if compared to Russia may account for the earlier realization by British children of the fact that part of their knowledge is acquired from other people, The different 'cultural stress' that is made in the two cultures on talking with young children about magic and magicians could have created the differences between Russian and British 4-year-oldsin their beliefs about the real existence of the almighty wizard.

Yet, these and other differences cannot disguise the fact that most characteristics of the development of metaphysical thinking in Russian and British children are the same the fact that supports an assumption about the fundamental and uniform character of metaphysical beliefs that exist within one type of rationality.

In general, the study revealed that as children advance in age the solutions given by them to cartesian metaphysical problems definitely approach those suggested by Descartes, with the most· sensitive period for the acceptance of rationalistic views being around 6- 7 years of age. As far as most of these rationalistic solutions (such as the view that there is an identity between being and thinking, between being and truth, the appreciation of the inseparable unity between mind and body, etc.) are beyond the limits of school curriculum, it is reasonable to assume that they appear spontaneously in the course of the child's life and everyday experience. It is quite obvious that European languages, thinking habits, social and moral norms, the ways of creating and handling human artifacts, fine arts and other facets of the contemporary European culture implicitly (if not explicitly) incorporate major structures of European rationality. It is not implausible to assumed that in the course of various activities and education the child absorbs these ideas which lay down the foundation for the child's metaphysical world outlook.

It can be further hypothesized that these rationalistic structures, which appear as latent and unconscious consequences of the child's everyday experience and independent thinking, later begin to exercise a feedback effect on the process of learning providing the child with a special 'language' which can help the child to get to grips with many areas of European culture (such as

sciences, fine arts, laws, etc.) which are, whether we like it or not, biased by the history of European rationality. The way this backward influence affects children's development and education is, however, to become a subject for a special study.

Chapter 3. CHILDREN'S JUDGEMENTS ABOUT METAPHYSICAL ASPECTS OF A HUMAN BEING

Along with metaphysical problems related to reality as a whole there is a special group of problems that makes emphasis on
what might be called 'human reality'. It is very difficult to tell between 'human reality' and 'reality proper' in general terms since, from a certain point of view, the whole reality can only be conceived as reflected in an individual human being or, as Kant put it, 'reason can see only what it created according to its own plan' (Kant, 1965, p.85). Nevertheless, since antiquity human reality used to be studied as a separate reality, as a 'microcosm' in which 'cosmos' of the external world is reflected and provided with sense and meaning.
       The interest of developmentalists in children's judgements about human psychology has been on the increase during recent decades. It resulted in a series of studies which concerned children's understanding of perception (Flavell et al., 1981), of human feelings (Caroll & Steward, 1986; Donaldson & Wasterman, 1986), of emotions (Bullock & Russel, 1984; Harris, 1989), defense mechanisms (Dollinger & McGuire, 1981) and others. Most of these studies, however, were concentrated on those particular aspects of human psychology which are confined to the realm of scientific expertise.
       As it is the case with metaphysical problems of the external reality, metaphysical problems of human reality (which could also be called 'metapsychological problems' had they not been touching˙ upon many aspects of physical reality) intersect with problems traditionally studied by sciences of man, such as psychology, physiology, sociology, etc. They are, however, different from scientific problems in that respect that they go beyond the realm of the traditional scientific thinking and scientific experiment. It does not mean, of course, that no definite solutions of the problems are possible, it only means that solutions like that depend very much on certain fundamental beliefs about the human being rather than on any kind of established and verified facts. Thus, for instance, a newborn infant (or, to put it more strongly, even a foetus in the mother's womb) is a subject of many sciences, however, no one of them is prepared to answer the question whether the infant (or fetus) is a personality with all sorts of complex emotions and the developed 'inner world' or it is just an organism

similar to subhuman organisms. It is the incapacity of sciences to answer this fundamental metaphysical question about the bonds between human organism and human 'spirit' that generates complicated social problems such as the problem of euthanasia or the problem of the legality of abortions.

The same is true with respect to causal determination of human actions. Scientific investigation can trace the smallest actions and movements of a criminal up to the moment of the crime itself, however, it cannot answer the basic question whether the criminal acted at the moment as a 'free subject' and is, therefore, personally responsible for the crime or his/her actions were predetermined by certain external circumstances. Paradoxically, this final judgement is laid upon the shoulders of the jury of laymen.

It is this kind of problems that was a subject of the most dialogues presented in this chapter. It starts with the dialogue which draws upon the problem of the 'threshold' which has to be crossed by a newborn infant in order to be ascribed the capacity of 'understanding' and 'self- realization' as well as the capacity to generate moral feelings. This dialogue, mostly 'psychologically' oriented, is followed by dialogues investigating more difficult metaphysical problems, such as the freedom of an individual action (Dialogue 2 'Freedom'), the fundamental 'incompleteness' and 'unfinished nature' of human passions and wishes (Dialogue 3 'Faust'), the role of the unconscious in human conscious actions (Dialogue 4 'The Unconscious'), the borderline between the human mind and that of animals and plants (Dialogue 5 'Inner word'), the fundamental human need to go beyond the limits of his or her individual lifetime (Dialogue 6 - 'Lifetime'), the limits which everyday reality lays upon human wishes and thoughts (Dialogue 7 'Reality').

73 children took part in this study as subjects: seventeen 5-year-olds (mean age 5.3) and fifteen 6- year- olds (m.a. 6.6) were recruited from a kindergarten in Moscow, eleven 1st graders (m.a. 7.4), ten 3rd graders (m.a. 9.7), ten 5 graders (m.a. 11. 7), and ten 7 graders (m.a. 13. 3) were taken from the school in Moscow.

The procedure was the same as in the study of children's metaphysical judgements presented in the previous chapter.

Dialogue 1. Psychology
The structure of the dialogue was based on the tract by the XVIII- th century French philosopher Condillac (1969) and on the model of psychological development created by Russian psychologist Lev Vygotsky (1981). Condillac (who too belongs to the founders of the rationalist view on a human being) has created

a model suitable for the investigation of children's judgements about the capacities and the limitations of the human infant's sensations, and Vygotsky produced a model which is far from being alien to the general rationalist view on a human being and stresses the role of language as a means of conversion of human lower mental functions in higher mental functions: by the lower mental functions the functions are meant (such as the primary sensations, perceptions, etc.) which are similar to those that other species have , whereas higher mental functions are specific to man and can be subject to reflective contemplation and voluntary control.

The aims of the dialogue were to determine to which extent the children were capable of realizing that a newborn human infant is unable (1) to reflect its sensations mentally, (2) to distinguish between sensations and the objects which cause them; (3) to relate its sensations to its own person (3) to know names of objects and (4) to understand that the acquisition of speech and knowledge about objects' names and moral norms by a child does not bring with it knowledge about social functions of objects and capacity to conform to moral norms. ˙

The dialogue had three parts in it, conventionally named as 'Sensations and perception', 'Names and functions of objects', and 'Moral knowledge and behaviour'.

In the replication study on this dialogue in the UK 4- year-old, 6- year- old, 9- year- old and 13- year- old children took part as subjects, with twenty children in each age group and equal numbers of boys and girls. The study was conducted by Sara Griffiths in her BSc research project (see Griffiths, 1994).

Each subject was interviewed individually. The child was shown a plastic doll whose eyes, ears, nose and hands were covered by pieces of plasticine. There were also a red ball and a blue cube made of plasticine, a door key and a little bell on the table. The instruction was as follows: 'Look at this doll. Let's imagine that it is a child who's just been born, o.k.? The child is alive but it is yet unable to see anything, to smell, to hear, to move and to touch anything with its hands look, its eyes and ears and hands are covered by plasticine. It also cannot speak and do not know anything at all, o.k.?

Part 1. Sensations and perceptions
After a few questions checking that the child understood what has been said about the doll, the plasticine cover was removed from the doll's nose and the following questions were asked:

1. Now I removed the plasticine from the infant's nose and it can feel odors, o.k.? Tell me, if I bring a piece of tissue˙

dipped in perfume to the infants nose, will it be able to feel the odor of perfume?

   2. And will it understand that it is an odor of perfume and not an odor of, say, a rotten potato?

   3. And will it be able to realize that it is it, the infant - and not some other person who feels the smell?

   4. Will it realize that it is a small child?

   5. Will it realize that other people exist in the world?

   6. And this smell of perfume, will it be pleasant or unpleasant for the infant?

   7. And if I brink to its nose and object with unpleasant smell, will it smell good odor or bad odor?

   The experimenter then removes the plasticine from the doll's ears and continues:

   8. Look, it's ears are now open too and it can hear sounds, o.k.? If I ring a bell near its ear, will it hear the sound?

   9. Will it realize that it is the sound of a bell and not, for instance, the sound that a fly produces?

   10. And will it realize that it is it, the infant and not some other person who hears the sound?

   11. And if I say 'Hello, boy' would it hear me?

   12. Will it understand what I have said?

   13. Will it realize that other people exist in the world?

   The experimenter removes the plasticine from the doll's hands˙ and says:

   14. Look, now it can move its hands and touch everything, o.k.? If I give this key to it to keep, will it be able to feel the key?

   15. Will it understand that it is a key?

   16. And if I give it my fur cap to touch, what would it feel?

   17. Will it understand that this is a cap and not another object?

   18. And if it puts its hand in hot water, what will it feel?

   19. Will it understand that it is water and not sand, for instance?

   20. Will it understand that other people exist in the world?

   The experimenter removes plasticine from the doll's eyes and continues:

   21. And now its eyes open and it can see things around. If I show it this red ball, what would it see?

22. Will it be able to understand that it is a ball and that its colour is red?

23. And if I show this blue cube to the infant, would it see it?

24. Would it understand that this is a cube and that it is blue?

25. If I put the ball and the cube next one another, would the infant be able to realize that they are different objects and˙ look differently?

26. And if I move this ball far away from the infant, would it be able to see it?

27. Will it be able to realize that the cube is closer to it than the ball?

28. And if the infant will look at a human person, what will it see?

29. Will it realize that this is a human person and not a cat, for instance?

30. Will it realize that it is a human being itself?

Part 2. Names and functions of objects
And now let's imagine that we taught the infant to speak and told it the names of all things around so that it can talk and knows how each thing is called, o.k.?

31. If I bring the piece of tissue dipped in perfume to the infant's nose now, what would it feel?

32. Will it know that this is perfume's odor?

33. And will it know what perfumes are used for?

34. And if I ring the bell near the infant, what would it hear?

35. Will it understand that this is the bell's sound?

36. Will it know what bells are used for?

37. If I give the infant this coin to keep will it understand that this is a coin?˙

38. Will it know what money are used for?

39. And if the infant will have a look at a human person, what would it see?

40. Will it understand that this is a human being and not a dog, for instance?

41. Will it understand that it itself looks like a human being?

42. And if I say 'Hi, say Hello to me' would it understand what I have said? What will it answer me?

43. And if I teach the infant how a spoon and a cup are called, would it be able to eat by a spoon and to drink from a cup?

Part 3. Moral knowledge and moral behaviour

44. Let's imagine that our infant gets hungry and sees a piece of chocolate on the table, what would it do?

45. And if at this very moment another child comes to our infant and asks politely for a piece of chocolate , would our infant give the child a bit or not?

46. And if our infant is hungry and sees another child who has a piece of chocolate in its hand, would our infant take the chocolate away or not?

47. Let's imagine that our infant was alone in the room and occasionally broke an expensive porcelain vase. If the infant knew that it was likely to be punished for this mischief, would it confess to the owners of the vase that it did it or it would not?·

48. Does the infant know that it is good to share one's sweets with other children, that it is good to be honest and not to tell lie, or it does not know this?

49. And if we tell the infant what is good and what is wrong to do, would it share sweets with another child? Would it take the chocolate away from another child? Would it tell the truth about who broke the vase?

50. In order our infant was able to do good things, is it enough to tell it what is good and what is bad, or it is not enough?

51. Are there children in the world who know how they should behave but they still don't behave?

52. But if they know how they should behave, why don't they behave?

Regarding the first part of the dialogue (sensations and perceptions) the results of the study showed that all the children acknowledged the newborn infant's capacity to experience olfactory, auditory, tactile, temperature and visual sensations and tell between various kinds of the sensations (i.e., between the pleasant and unpleasant odors, between the bell's ring and fly's noise, between hard and soft, cold and warm, red and blue).

The picture reflecting children's views on the type of relationships between senses and objects that produced them turned to be more complex (see Fig.44). Most preschoolers and some school age children thought that the newborn infant who can not speak and has no personal experience would, nevertheless, know· what kind of objects produced these particular sensations, although it had not been specified in the question what this knowledge includes. The overwhelming majority of the children grounded their opinions in such a way as though sensations alone contained information about the objects by which they were

initiated and a newborn infant was capable of realizing it ('The infant will understand that this is perfume, because it is the smell of perfume, and rotten potato has a different smell.' 'He will touch the water, and the water is not hard and heavy, and the infant will realize instantly that this is water.' 'He will understand that this is a cube, it has sides, and a ball it is round shaped.'). A number of children who attributed an inherent capacity to guess about the objects on the basis of sheer sensations to the newborn infant decreases significantly among 11-years- old/5gr. if compared to 5-year-olds(z values for various kinds of perceptions were as follows: for olfactory perceptions -4.58, p<.05; for auditory perceptions 5.57, p<.02; for tactile perceptions 1.63, n.s.; for visual perceptions 7.38, p<.01). In general, children proved to be inclined to ascribe knowledge about senses- initiating objects to the infant's visual sensations significantly more often than to the infant's sensations of other modalities (z=5.57, p<.01).

The rest of the subjects (mainly schoolchildren) refused to ascribe knowledge about senses- initiating objects to the newborn infant on two major grounds. Almost all preschoolers and most 1 graders of this group pointed out to the fact that it was only visual sensations that could directly provide information about˙ the objects that initiated them, whereas sensations of other modalities could only be 'object related' if they were accompanied by visual sensations ('The infant won't be able to understand that this is a key, because his eyes are closed.' 'He won't realize that this is perfume's odor, because he cannot see anything.'). The second type of justification which was produced by most 9- year-olds and older children made stress on the absence of personal experience in the newborn child; according to this view, since the infant has just been born it cannot know what kind of objects stand behind it's sensations ('No, he won't be able to know, because he doesn't know what perfume is and what the odor of the rotten potato is.' 'I think the infant won't understand this because the infant only sees the world for the first time in his life.'). Giving this type of justification, the children didn't directly link it with the necessity for the infant to communicate with other people in order to get the experience needed, however, this link might have been present implicitly in their reasoning.

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Children who thought that an infant would know what kind of objects initiated each type of sensation (1) before the infant acquired language (—) and with regard to olfactory sensations (q. 2, ○), auditory sensations (q. 9, □), tactile sensations (q. 17, △), and visual sensations (qq. 22 & 23, ⊕), and (2) after the infant acquired language and learned objects' names (- -), with each type of sensations shown by the same symbol as above, qq. 32, 35, 37, and 40, respectively.

FIG. 44. Percentages of children producing answers in response to questions regarding the infant's knowledge of objects that cause various sensations.

Almost all subjects stated that after the infant was taught to speak and learned the objects' names he or she would be able to know what were the objects that initiated the sensations (Fig.44). Those children who claimed this before now simply reproduced their previous justification which they provided with regard to the prespeech infant; obviously, the fact that the infant has learned to speak didn't affect the children's judgements. Many of the children who denied that the prelinguistic infant was able to know anything about the senses- initiating objects, attributed the knowledge to the speaking child, providing two types of justifications. Some of them thought that the infant now could see the objects and therefore know what they are (the 'priority of vision' type of argument)('Now the infant will know that it is a ring of a bell, because his's eyes are open.' 'He will know, he will see with his's eyes that this is a bell that gives the sound.'). Others (the majority in this group) answered that if the infant had been told the objects' names then he was able to associate sensations with the objects ('If you come to the child and tell him that this is perfume, then he will understand that

this is perfume that produces the odor.' 'Well, she has been told the names, and now she will have a look at it, touch it, and, perhaps, with some difficulty but she will tell that this is a key.'). Overall, the total number of children who attributed knowledge about senses- arousing objects to the speaking child significantly exceeded that of the children who attributed the knowledge to the prelinguistic infant (z =6.4, p<.01)

The replication study in the UK showed that as for the attributing the capacity to know what kind of objects have initiated various types of sensations to a prelinguistic infant, British 6-year-oldsmade this attribution significantly less often than Russian 6-year-oldswith regard to olfactory, auditory and tactile sensations, and British 4- year- olds, 9-year-olds and 13-year- olds did this less often than did Russian 5- year- olds, 9- year-olds and 13-year-oldswith regard to visual sensations (Fig. 45).

DIALOGUE 1: "PSYCHOLOGY"   139

Russian —,   British —
Olfactory △,   auditory □,   tactile ✛,   visual ○

FIG. 45. Percentages of Russian and British children who believed that a prelinguistic infant knows what kinds of objects initiate olfactory, auditory, tactile, and visual sensations.
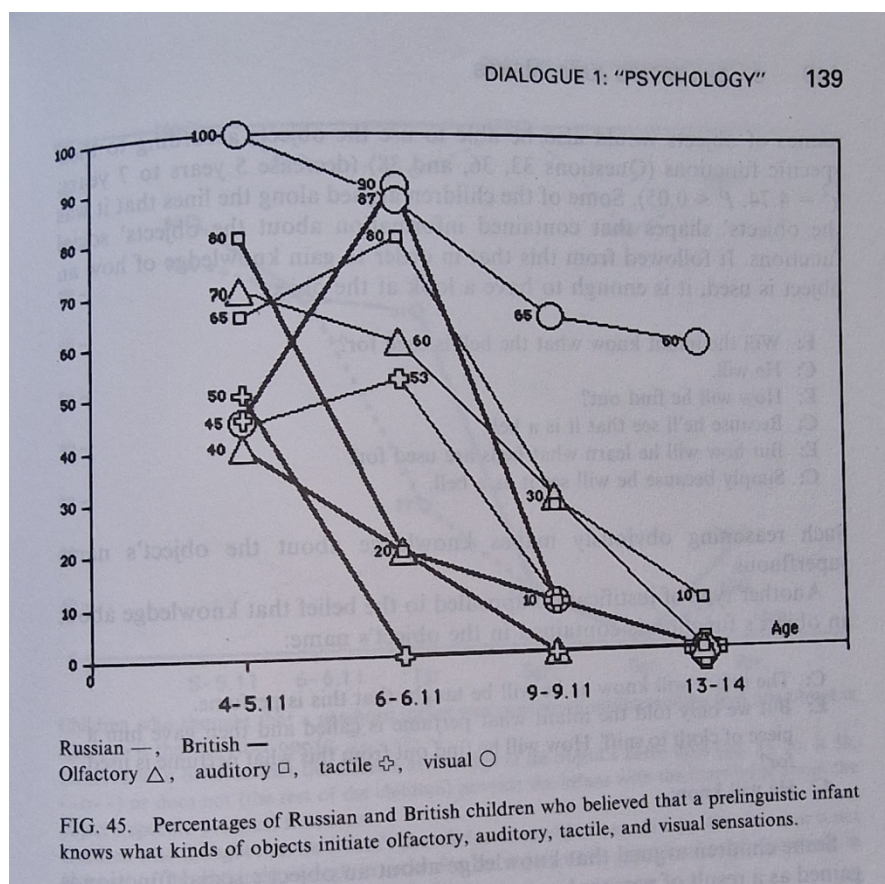
There was no significant difference found between answers of British and Russian children with regard to the attribution of knowledge about the senses- initiating objects to a child who was taught to speak. This would suggest that although British children, in general, were less inclined to attribute the 'inherent
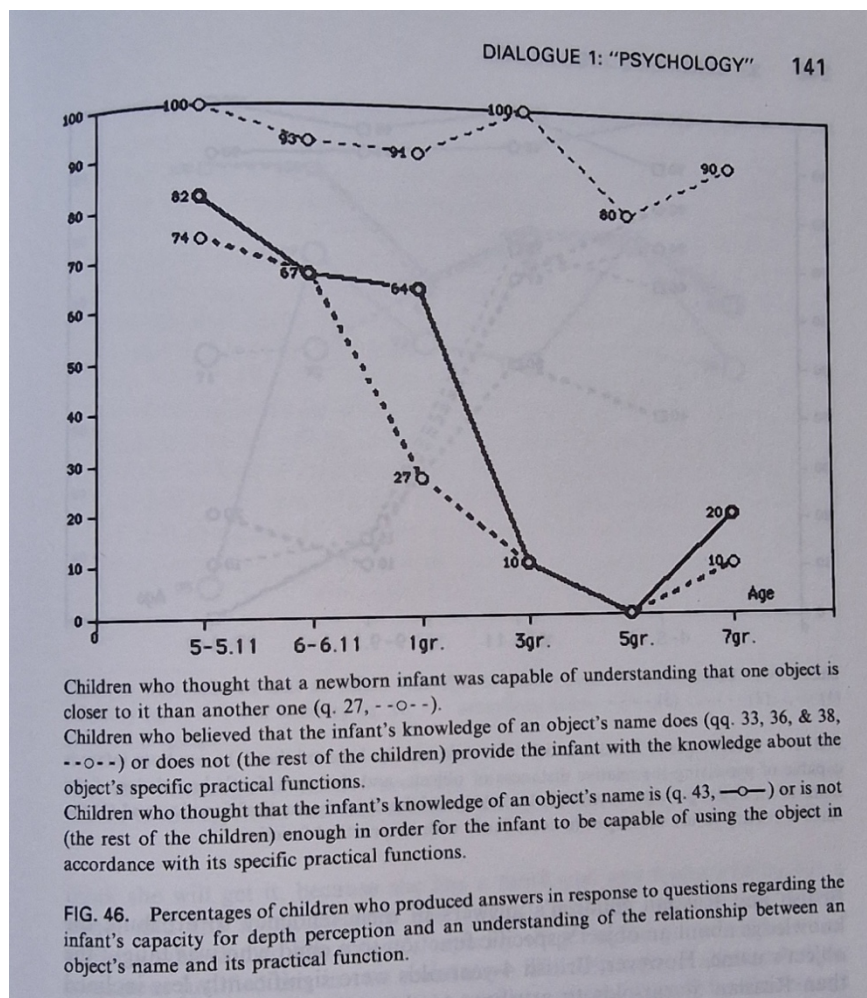
knowledge' about objects' names to the prelinguistic infant than were Russian children, this attribution yet was clearly present among British 4- and 6- year- olds, particularly as far as it concerned auditory and visual sensations. However, if compared with Russian children, this attribution of precocious capacities to a prelinguistic infant significantly decreased in British children in an earlier age (6 years versus 9 years in Russian children) the finding that can be attributed to the earlier start of the intensive school education in Britain. Why school education has this detriment effect on British and Russian children's tendency to overestimate the infant's knowledge is yet to be established; however, it can be assumed that this is an indirect result of the general growth in the intellectual decentration of children in the process of school education, rather than a consequence of any specific growth in psychological knowledge.

An absolute majority of the subjects acknowledged that an infant who sees the objects for the first time would be able to appreciate their relative distances from itself (question 27); it˙ followed from children's justification that the capacity to depth perception was viewed as inherent in the child ('The infant will understand because it will be clear for the infant that the ball is at a larger distance from him than is the cube.' 'He will understand this. But how? I don't know how...perhaps it is...what is it called?... instinct.'). Some of the children added to this remarks about the resolutive capacity of vision or the law of perspective ('He will understand, because he would see the cube better than the ball.' 'She will know this because when it is far away it looks very small, and when it is close it is big.'). Only a few subjects refused to attribute the capacity of 'depth perception' to the newborn infant on the ground that the infant had no experience of manipulating with objects to be able to appreciate the distances.

With respect to relationships between names and functions of objects most children believed that the child who could speak and was told the objects' names would also be able to use the objects according to their specific functions (questions 33,36, and 38) (decrease, 5 years to 7 years/1gr., $\chi 2 =4.74$. p<.05). Part of the children argued along the line that it was the objects' shapes that contained information about the objects' social functions. It followed from this that in order to get the knowledge about how the object can be used it was enough to have a look at the object ('Will the child know what the bell is used for? He will. How will he find out about this? Because he'll see that this is a bell. But how will he learn what bells are used for? Simply because he will see that this is a bell.'); obviously, this type˙

of reasoning make the knowledge about objects' names superfluous.

Another type of justification appealed to the belief that knowledge about the objects' functions is contained in the objects' names ('The infant will know, he will be taught that this is perfume. But we only told the infant how perfume is called, and gave the infant a piece of cloth to sniff. How will he find out from this what perfume is used for? He will know.'). Some children argued that knowledge about objects' social functions was the result of personal experience that the infant had with the objects ('The child will know what money are used for. She used to go to the market with her mum and saw that people sell and by things for money'). Obviously, this group of children implicitly attributed more experience to the infant than it was supposed to be under the instruction (the infant was only told names of object) (Fig.46).

Children who thought that a newborn infant was capable of understanding that one object is closer to it than another one (q. 27, - -o- -).
Children who believed that the infant's knowledge of an object's name does (qq. 33, 36, & 38, - -o- -) or does not (the rest of the children) provide the infant with the knowledge about the object's specific practical functions.
Children who thought that the infant's knowledge of an object's name is (q. 43, —o—) or is not (the rest of the children) enough in order for the infant to be capable of using the object in accordance with its specific practical functions.

FIG. 46. Percentages of children who produced answers in response to questions regarding the infant's capacity for depth perception and an understanding of the relationship between an object's name and its practical function.

As it is obvious from Fig.46 the number of children who denied that the infant had the capacity to use objects according to their specific functions increased significantly among 9- year-olds/3gr. if compared to 7- year- olds/1gr. ($\chi2 =6.89$, $p<.01$); the typical argument used by the children was that the infant was yet small and could not know what object are used for. Some of the children stressed that knowledge about objects' names didn't contain knowledge about their specific functions.

Question 43 about whether the children who learnt about the names of a spoon and a glass would be able to use them for eating most preschoolers and 1 graders answered in the positive (Fig.46) grounding their opinions in the way as though knowledge about objects' names automatically brought with it the necessary skills of using the objects ('Will the infant will be able to eat with a spoon and drink from the glass? Yes, he will. Why? Because he knows what it is a spoon and a glass.'). Other children denied the direct link between the objects' names and the skills of using the objects ('No he won't be able to use them, because he can't use them, he only knows the names.' 'Names give nothing for practice.')(increase, 7 years/1gr. to 11 years/3gr., $\chi2 =4.31$, $p<.05$).

The comparative study in Britain revealed that British children ascribed the capacity to appreciate relative distances to objects to a prelinguistic infant to the same extent that did Russian children (see Fig. 47) .

FIG. 47. Percentages of Russian and British children who believed that (1) a newborn infant is capable of perceiving the relative distances of objects, and that an infant's knowledge of the name of an object provides it with (2) knowledge of the object's practical function and (3) the skills necessary to use the object in accordance with its practical function.
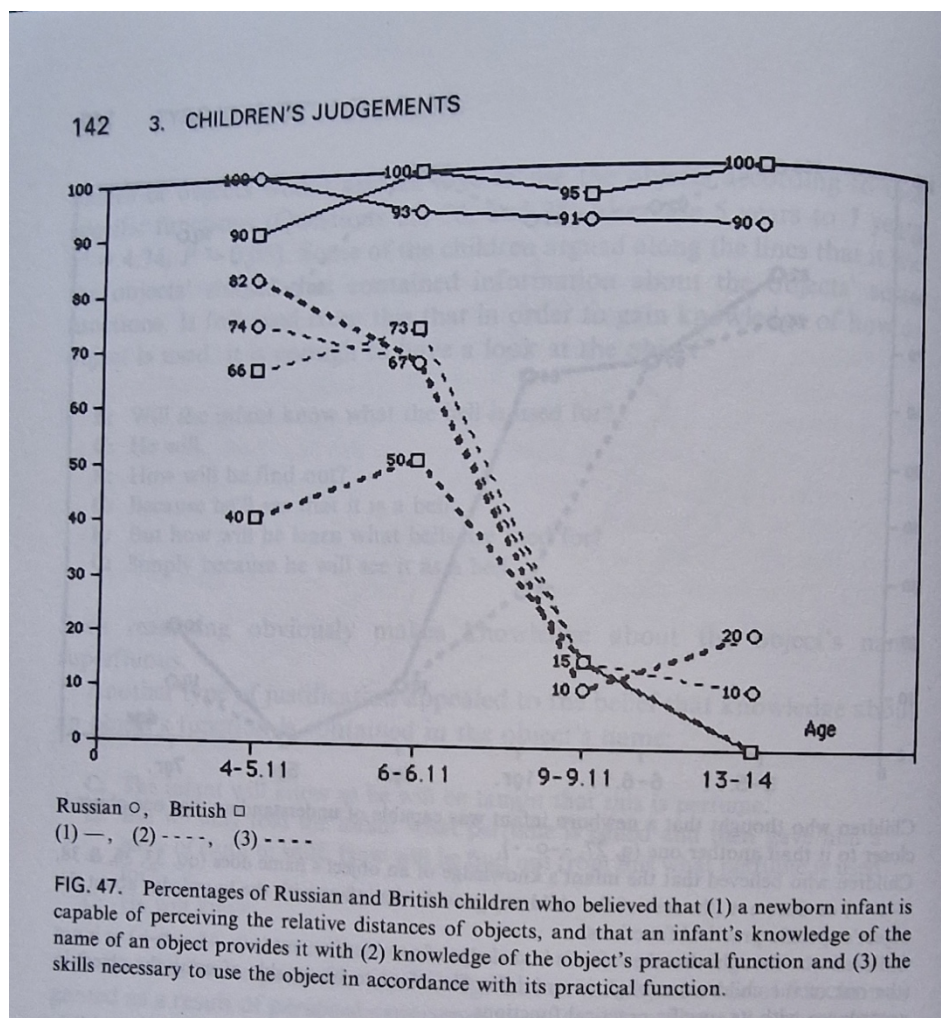
There were no significant differences between British and Russian children's answers in their tendency to attribute the knowledge about the objects' specific functions to a child who was taught objects' names. However, British 4-year-oldswere significantly less inclined to attribute to the child the skills necessary for using the objects in accordance with their appropriate functions than were Russian 5- year- olds, this difference was not observed in older children. Basically, the appreciation of the limited· character of knowledge about objects' names comes to British children at the same age as to their Russian peers, that is between 6 and 9.
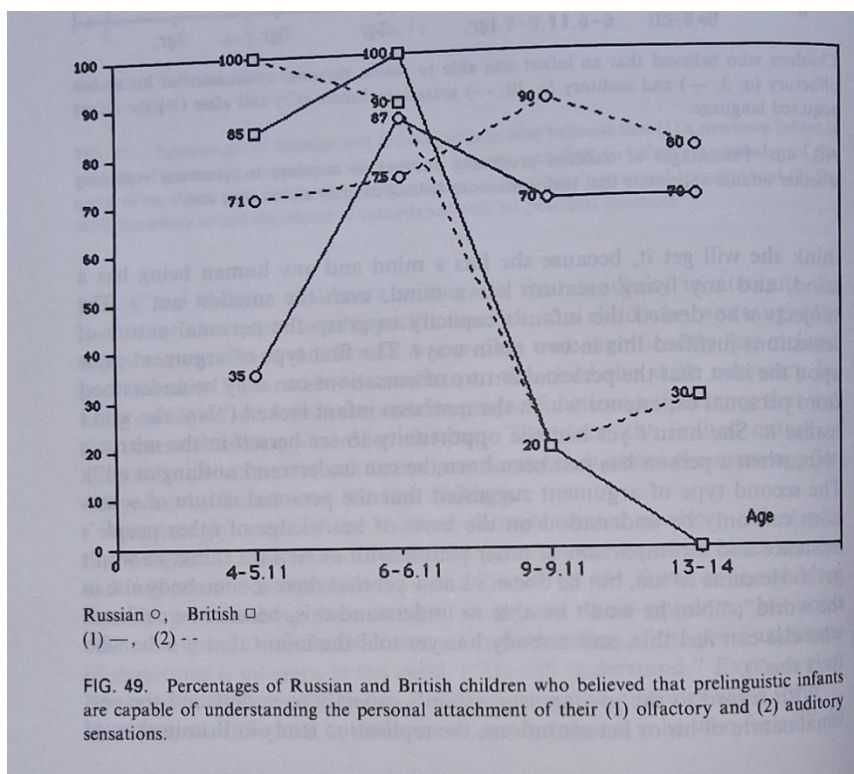
Interestingly, most children thought that a newborn infant who could not speak would be able to understand personal identity of its olfactory and auditory sensations (questions 3 and 10, see Fig.48). Part of the children (mainly preschoolers) were unable to ground their opinions, the rest of the children argued along the line from which it would follow that the understanding of personal

Children who believed that an infant was able to realise personal attachment of his or her olfactory (q. 3, —) and auditory (q. 10, - -) sensations before (○) and after (□) the infant acquired language.

FIG. 48. Percentages of children producing answers in response to questions regarding whether infants appreciate that their sensations belong to them and no-one else.
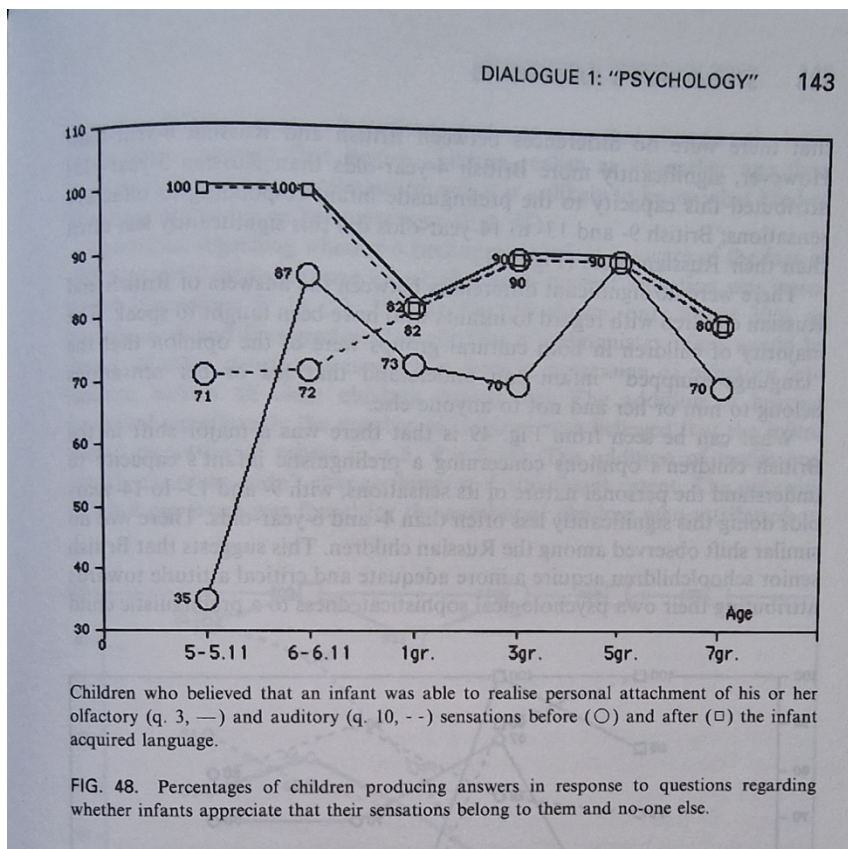
nature of sensations is inherent in the child ('He will understand. - But how? Well, he will feel it...I even can't find a proper word for it...He simply must be able to understand and feel that it is he who feels it.' 'I think she will get it, because she has the mind and any human being has the mind, and any living creature has the mind, even a smallest ant.'). Subjects who denied the infant's capacity to grasp the personal relatedness of sensations justified this in two major ways: one type of arguments drew upon the idea that personal relatedness of sensations can only be understood from a long personal experience which the newborn infant lacked ('No, she won't realize it. She yet had no an opportunity to see herself in the mirror.' 'No, when a person has just been born, he can understand nothing at all.'), and the other type of justifications suggested that personal relatedness of sensations can only be understood on the basis of knowledge of other people's existence and the comparison between other people and himself or herself ('I think, he won't get it. He came to life, but he doesn't know yet that there is somebody else in the˙ world.' 'No, he won't be able to understand this, because he can't tell who else can feel this, and nobody yet told to the infant that it is he who feels this').

    With regard to a prelinguistic infant's capacity to

understand personal relatedness of his or her sensations, the
replication study in Britain showed that there were no differences
in attribution of this capacity between British and Russian 6- year-olds, however, British
4-year-olds attributed it regarding
olfactory sensations significantly more often than Russian 5- year-olds, and British 9- and
13- 14-year-olds did this significantly less often than their Russian peers (Fig. 49).

FIG. 49. Percentages of Russian and British children who believed that prelinguistic infants
are capable of understanding the personal attachment of their (1) olfactory and (2) auditory
sensations.

There were no statistical differences between answers of
British and Russian children with regard to the infant who was
taught language: here the majority of children in both cultural
groups were of the opinion that the 'language equipped' infant
would understand that his/her sensations belonged to him/her and
not to somebody else.

What can be seen from Fig.49 is that there was a major shift
observed in British children's opinions concerning a speechless
infant's capacity to understand personal relatedness of his/her
sensations, with 9- and 13- 14-year-oldsdoing this significantly·
less often that 4- and 6- year- olds. There wasn't a similar shift
observed in Russian children. This would suggest that British
senior schoolchildren acquire a more adequate and critical
attitude towards attributing their own psychological
sophisticatedness to a prelinguistic child than their Russian
peers a hypothesis that was suggested above in this manuscript
on the basis of evidence showing that British children at an
earlier age than Russian children could realize that a

prelinguistic infant was unlikely to know what kind of objects initiated his or her sensations (Fig. 45).

The questions about whether the prelinguistic infant would be aware of the fact of other people's existence were put each time after a new type of sensations was introduced (questions 5, 13, 20, 29). As Fig.50 shows, only about 30 percent of preschoolers and 1 grad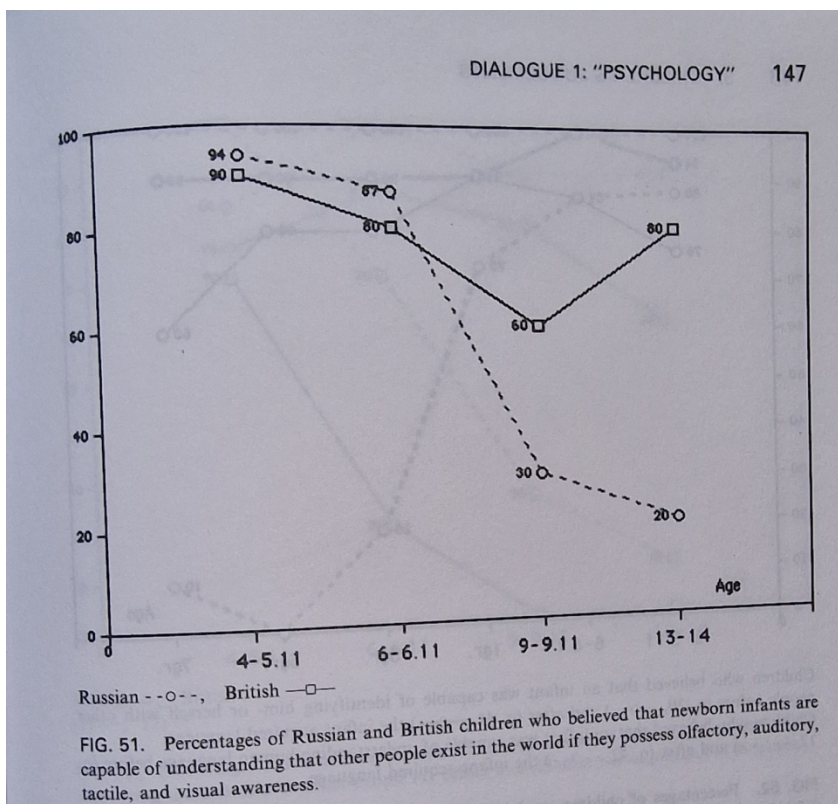ers thought that the infant would be aware of other people's presence if it is in a possession of olfactory sensations only; almost all older children denied that the infant would have such awareness. The addition of hearing increased significantly the number of such children among the total sample ($z=5$, $p<.01$). The addition of tactile and visual sensations didn't change significantly the total pattern of answers which stayed close to the one for olfactory and auditory sensations. The only significant age trend was found for the number of children who attributed the awareness of other people's presence to the prelinguistic infant who was in a possession of all four senses (decrease, 6 years to 9 years/3gr., $\chi2 =6.62$, $p<.02$). In all the cases children's argumentation was very much alike ('He would be˙ aware that there are other people around, because he would hear that other people are talking.' 'She would touch some person, and realize that there are other people in the world.'). Those children who denied the infant's capacity to realize the presence of other people either referred to the fact that having this limited set of senses was not enough for that ('She wouldn't be able to realize this, she can't yet hear anything.' 'He won't understand this because he can't see.') or pointed out that knowledge about other people's existence can only be acquired through life experience which the infant lacks. Although the infant's acquisition of language significantly increased the average number of positive answers within the total sample of subjects ($z =6.4$, $p<.01$), the argumentation mainly stayed the same and didn't involve language as an indicator of other people's existence; only a few children (5- and 7- graders) pointed out that knowledge about other people's existence could be acquired through linguistic communication and teaching.

Children who thought that a newborn infant would be capable of understanding that there are other people around him/her if the infant had (1) only olfactory sensations (q.5, —o—), (2) olfactory and auditory senstions (q. 13, —o—), (3) olfactory, auditory and tactile sensations (q. 20, - -o- -), (4) olfactory, auditory, tactile and visual sensations (q. 29, - -o- -). Children who believed that the infant was capable of understanding that there are other people in the world after he/she acquired language (—□—).

FIG. 50.   Percentages of children producing answers in response to questions regarding infants' capacity to understand that other people exist in the world.

The comparative study in Britain showed that the majority of British children as well as of their Russian peers were sure that a newborn infant would understand that there were other people around him or her as soon as the infant acquired language. With regard to a prelinguistic infant who possessed only olfactory sensations, British children denied that he or she would be able to realize other people's presence to the same extent that did‍ their Russian peers (i.e., between 70% and 100% of children in each age group answered in the negative). There were no differences between answers of British and Russian children on this question with regard to a prelinguistic infant who possessed olfactory and auditory sensations, and olfactory, auditory and tactile sensations. However, British 13- 14- year- old children significantly more often than their Russian peers ($\chi2=7.6$, $p<.005$) acknowledged that a prelinguistic infant would realize the other peoples' presence as soon as visual sensations joined the others (Fig.51) the fact that runs against the previous findings about British children's generally more cautious attitude towards attributing precautious psychological capacities to a

prelinguistic infant.

FIG. 51. Percentages of Russian and British children who believed that newborn infants are capable of understanding that other people exist in the world if they possess olfactory, auditory, tactile, and visual awareness.

Most children of all ages thought that the prelinguistic infant would be able to realize that it has common features with other people (question 30); for this to be possible, it was enough for the infant to have a look at itself and at another person (Fig.52). More than that, for many preschoolers and 1 graders the prelinguistic infant was also able to understand human speech (question 12), although the number of such children decreased rapidly with age (decrease, 7 years/1gr. to 11 years/3gr., $\chi2=3.91$, $p <.05$). The children who answered these questions in the negative normally justified this by the infant's lack of experience and interaction with other people. As in many other cases, the fact that the infant acquired language (questions 41 and 42, respectively) changed the results by increasing the number of positive answers (for the infant's capacity to understand human speech the increase was significant, with $z=6.4$, $p<.01$ for the total sample).

Children who believed that an infant was capable of identifying him- or herself with other people before (q. 30, —o—) and after (q. 41, —o—) the infant acquired language.
Children who believed that an infant was capable of understanding human language before (q. 12, --o--) and after (q. 42, --o--) the infant acquired language.

FIG. 52.   Percentages of children producing answers in response to questions regarding an infant's capacity to identify itself with other people and to understand human language.

    In the comparative study British 6-year-olds and older children were significantly more skeptical about a prelinguistic infant's capacity to realize that he or she was a human being than were their Russian peers, and British 9- and 13-year-olds even extended this skepticism to include the child who was taught to speak (Fig.53)

Russian ○,   British □
(1) —,   (2) - -

FIG. 53.   Percentages of Russian and British children who believed that infants are capable of identifying themselves with other people (1) before and (2) after the acquisition of language.
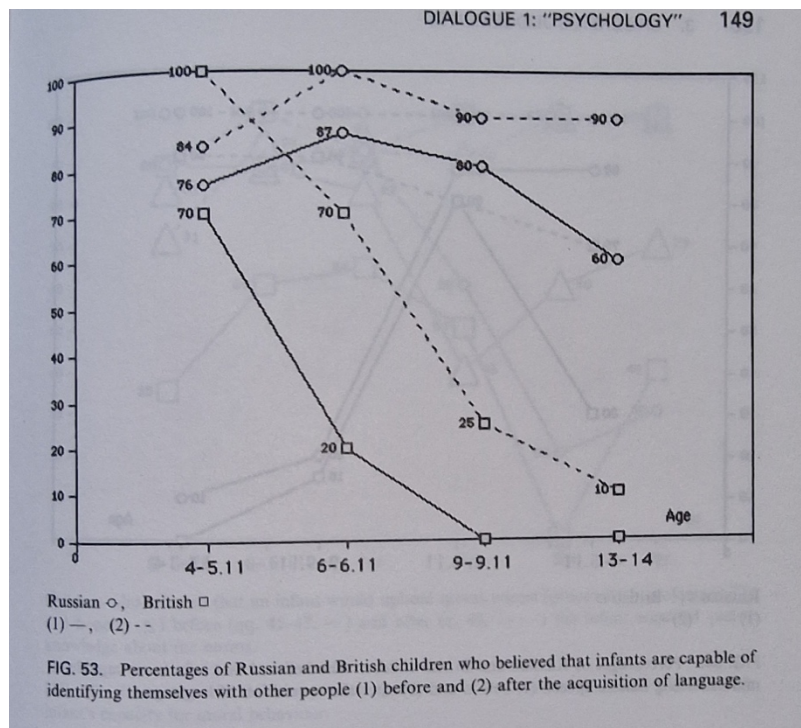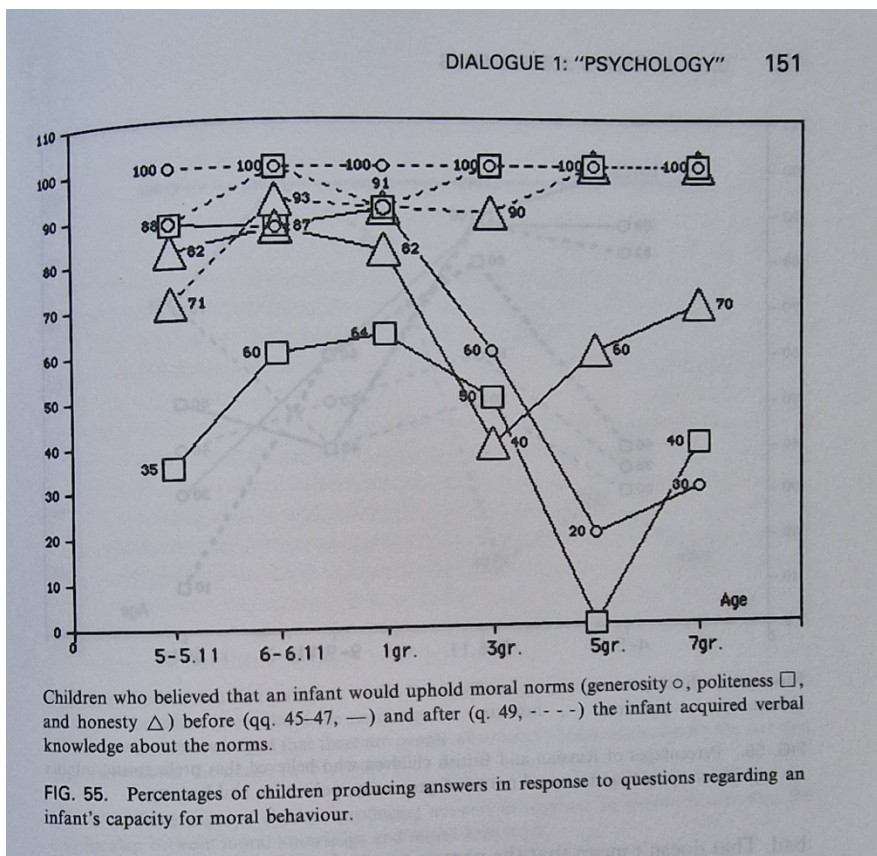
There were no differences between British and Russian children's judgements about the infant's capacity to understand human speech, apart from that British 4-year-olds ascribed this capacity to a prelinguistic infant significantly less often than did Russian 5-year-olds ($\chi2=7.3$, $p<.007$) (Fig.54)

FIG. 54. Percentages of Russian and British children who believed that infants are capable of understanding human speech (1) before and (2) after the acquisition of language.
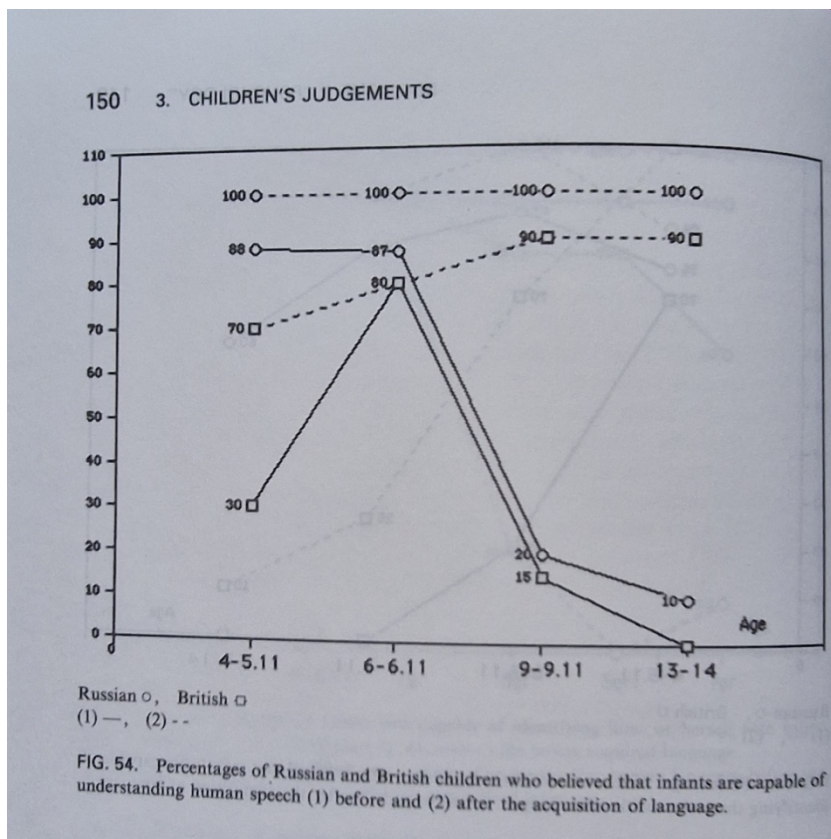
Despite all of this, British 4- and 6-year-oldsdid reveal a substantial 'anthropomorphic' tendencies in supplying a prelinguistic infant with precocious psychological capacities, although British 9- and 13year- olds did this less often than did Russian children of the same age groups.

With regard to questions about the infant's capacity to manifest moral behaviour (Part III of the dialogue) most preschoolers and 1- graders thought that the infant who was only able to speak and knew objects' names could also observe certain moral norms (Fig.55). Even among older schoolchildren (3- to 7-grades) there were some children who ascribed this moral capacity to the child. Providing grounds for this view some children spoke in the way, as though moral motivation was inherent in the infant ('No, he won't take the chocolate away from a little child, because he is a good person.' 'No, she won't take the food away from the infant, because she if she did she would feel ashamed of herself.'); others stated that the infant would keep to the moral norms either because of the fear of punishment or in the search of rewards ('He would tell the truth that he broke it. Why? - Because he would be punished if he didn't.').

Children who believed that an infant would uphold moral norms (generosity ○, politeness □, and honesty △) before (qq. 45–47, —) and after (q. 49, - - - -) the infant acquired verbal knowledge about the norms.

FIG. 55. Percentages of children producing answers in response to questions regarding an infant's capacity for moral behaviour.
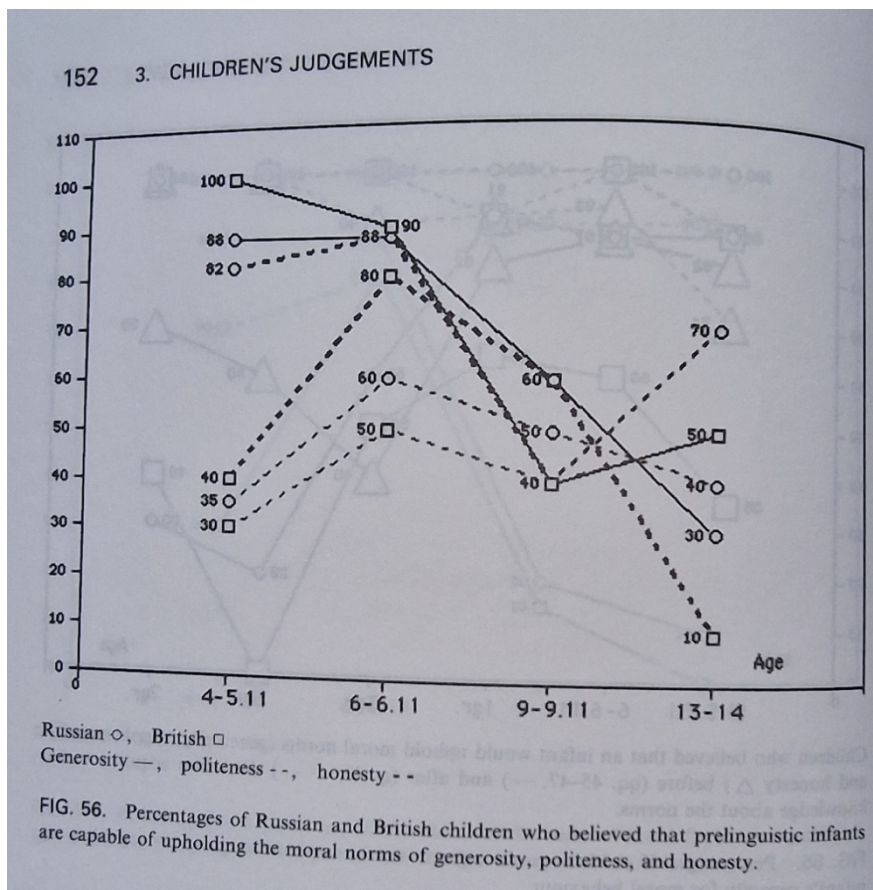
Those children who denied that the infant would be able to uphold moral norms brought about two major reasons: some of them pointed out that moral behaviour was based on the knowledge of the norms and on certain moral feelings which are absent in the infant ('He wouldn't share the chocolate, because...he doesn't yet know whom he should share things with.' 'She can take the chocolate away. Why? Well, she doesn't know what is good and what is bad.' 'Basically, he must share, but...he won't because he has no yet such feelings as kindness and compassion.'), other children simply noted the fact that observing moral norms would be at odds with the infant's personal interests ('She would deceive, because she was afraid.' 'He would take the chocolate away because he wants the chocolate.'). In this groups eight children were included who told that the infant wouldn't share his or her property and would take the chocolate away from a smaller child but wouldn't deceive adults because he or she is yet naive and is not aware of the possibility of concealing the truth ('He won't deceive, because...he is yet small for this.' 'The infant is naive and he doesn't know what lie is.') The number of children who ascribed the capacity of observing moral norms to the infant decreased with age: regarding the norms 'generosity' and 'politeness' the decrease was stable and significant, 7 years/1gr. to 11 years/5gr., $\chi^2 = 8.05$ for generosity, and $\chi^2 = 6.89$ for politeness, for
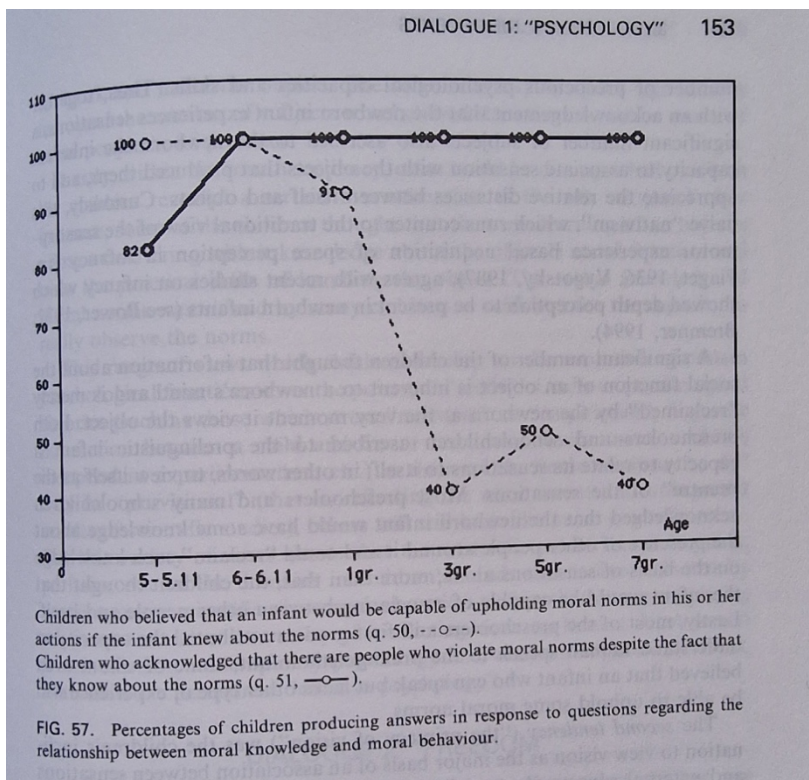
both p<.01.

Almost all of the children acknowledged that after the child acquired speech he or she would observe moral norms. The number of children who answered question 49 about the speaking child in the positive significantly exceeded the number of those who ascribed moral capacity to a prelinguistic infant (z=5.6, p<.01 for the total sample). Along with the reasons described above some of the subjects referred to the effect of learning on the infant ('He won't deceive, he is already taught properly.' 'She was told that she must do this.'). Only a few children kept thinking that the infant won't be able to observe moral norms even if told about them, but they were unable to justify their opinions ('He will still deceive. - But he will know that to lie is a bad thing to do, why would he still deceive? Because he doesn't understand'.)

The replication study in Britain showed that British children demonstrated the same age pattern of answers with regard to the child's capacity to observe norms 'generosity' and 'politeness' before the child acquired knowledge about the norms as did Russian children, namely, most 4and 6-year-oldsand about a half of 9- and 13- 14-year-oldsthought that the child would observe the 'generosity' norm, and about 30- 50% of children of all age groups though the same regarding the 'politeness' norm (Fig.56)

However, British 4- and 13- 14-year-olds were significantly less than their Russian peers inclined to attribute moral behaviour to a 'morally ignorant' child as far as 'honesty' norm was concerned, that is, there were more British children than Russian children who thought that the child would deceive if he or she did not know that deception was a wrong way of behaviour. The absolute majority of British children (i.e., between 75 and 100%), as well as of Russian children, thought that a child would uphold moral norms as soon as he/she learned about them.

Russian ◇,   British □
Generosity —,   politeness - -,   honesty - -

FIG. 56. Percentages of Russian and British children who believed that prelinguistic infants are capable of upholding the moral norms of generosity, politeness, and honesty.

The pattern of children's answers to question 49 was reproduced by preschoolers and 1st graders in response to question 50 in which the same problem was put with a special emphasis on the sufficiency of the verbal knowledge of moral norms for their real implementation (Fig.57). However, this time most 3- , 5and 7- graders refused to confirm that sheer knowledge of moral norms by the infant would make him or her conform to the norms (increase, 6 years to 9 years/3gr., $\chi2=7.78$. p<.01). Most of these children thought that the infant would be able to observe the norms if he or she were demonstrated positive moral models ('No, it is not enough to tell the infant what is good, you also have to show how to do this good.'). Only a few children pointed out that in order to be able to observe moral norms the infant has to have something special in his/her character and personality ('No, this is not enough to tell a person what is good and what is bad. It doesn't yet mean that the person can understand this. - What else is needed? You have to make the person realize things; the person has to have a good character').

Children who believed that an infant would be capable of upholding moral norms in his or her actions if the infant knew about the norms (q. 50, - -o- -).
Children who acknowledged that there are people who violate moral norms despite the fact that they know about the norms (q. 51, —o—).

FIG. 57. Percentages of children producing answers in response to questions regarding the relationship between moral knowledge and moral behaviour.

Nevertheless, when question 51 was asked about the availability of the children who know moral norms yet don't observe them which moved the problem 'is knowledge of moral norms sufficient for real moral behaviour?' from a theoretical plane into the plane of real- life observations, all the subjects but five responded in the positive with their answers getting in an obvious contradiction with their earlier statements. When asked to explain the discrepancy in the child's behaviour (i.e., violation· of the norms which are well known to the child, question 52) most preschoolers and part of the schoolchildren proved to be unable to do this; others produced four types of explanations. Some of the children saw the cause of the discrepancy in the fact that these transgressors didn't understand the moral norms properly or forgot them. Others (the majority) accounted for the discrepancy by the defects in the transgressors' personalities ('They do this because they are bad people.' 'Because they are hooligans.' 'Well, they have bad characters, they don't like telling truth.' 'Because they were born like that...they just want to do this, you can tell them whatever you like, they would still do it.'). The other two types of explanations were more psychologically profound and appealed to the insufficient development of moral motivation in the transgressors: some of the children stated that the deviations were caused by the priority of pragmatic motivation over moral motivation ('Well, I think they need the things desperately, and

this is stronger than the thought 'you mustn't.' 'Well, perhaps, if a person needs something very much the person cannot restrain himself any longer.' 'Their will isn't strong enough.'), others simply referred to the lack of moral motivation in the transgressors ('Well, I think they don't like it to behave well.' 'Well, they don't want to restrain themselves.' 'Well, firstly, because they...were brought up poorly, and you can't change them.').

The study in Britain yielded results on questions 50 and 51 that did not differ from those yielded in the study with Russian children.

In sum, the data revealed some clear-cut age tendencies in children's judgements about the role of psychological functions. The *first tendency* was of younger subjects to ascribe to a newborn infant a number of precocious psychological capacities and skills. Thus, along with acknowledging that the newborn infant would have sensations, a significant number of our subjects also ascribed to the newborn the inherent capacity to associate sensation with the objects that produced them, and to appreciate the relative distances between itself and the objects. Curiously, this naive 'nativism', which runs contrary to the traditional view that the acquisition of space perception in infancy is based on sensory-motor experience (Piaget, 1936; Vygotsky, 1987), corresponds to the recent data on infancy studies that show depth perception to be present in newborn infants (see Bower, 1972; Bremner, 1984).

A significant number of the children thought that information about social functions of objects is inherent to the newborn's mind and is merely 'reclaimed' by the newborn at the very moment of objects' perception. Both preschoolers and schoolchildren ascribed to the prelinguistic infant a capacity to relate its sensations to itself, in other words, to view itself as a certain 'center' of the sensations. Most preschoolers and a considerable part of schoolchildren acknowledged that the newborn infant would have some knowledge about the presence of other people around and could 'reclaim' the knowledge on the basis of sheer sensations; more than that, the children thought that the infant would be capable of associating between the other people and itself. Lastly, most of the preschoolers and 1- graders attributed the capacity to understand human speech to the prelinguistic infant, and part of the children even thought that the infant who can speak but lacks other type of experiences would be able to uphold some moral norms.

The *second tendency* (that could be named 'the primacy of vision') was the children's inclination to view vision as the major basis of associating between sensations and external

objects. As our data revealed, the children (both pre- and school aged) ascribed this capacity to sensations of visual modality significantly more often than to other types of sensations.

The *third tendency* was the gradually oncoming acknowledgment of the role of infant's personal experience for the development of the infant's psychological capacities. Being a counterflow to the previous tendency, this tendency could conventionally be called 'the primacy of experience.' Thus, a considerable part of 1st-graders and older children revealed a clear appreciation of the link between personal experience the infant can get through interaction with external objects and the infant's capacity to associate between sensations and the objects that produced them. The infant's personal experience was also referred to as a source of the infant's knowledge about social functions of objects and about the presence of other people in the world.

The *fourth tendency* was the gradual awareness by the children of the part that language plays in the psychological development of the child. It turned out that a significant number of subjects (mainly schoolchildren) would link the infant's capacity to˙ associate between sensations and external objects to the infant's capacity to speak and name the objects. The fact that the infant was taught to speak significantly increased the number of subjects who attributed the capacity to realize the presence of other people to the infant. The awareness of the role of language, however, was only present in the potential form; that such an awareness is the case could be inferred from children's reasoning, although it was very rare that speech was actually mentioned in children's justifications and explanations.

Lastly, within the latter tendency the cases could be distinguished in which the children revealed a certain hype revaluation of the role of speech. For instance, some of the children thought that a sheer learning of the objects' names would bring with it the knowledge about the objects' social functions and even the practical skills of handling the objects. The verbal knowledge of moral norms was viewed by many children as sufficient for the capacity to really observe the norms.

Obviously, this vast specter of views children develop on the evolvement of certain psychological functions shows the potential presence of 'seeds' of various psychological theories (such as those making stress on either 'nativism' or 'empiricism', on either linguistic interaction between a child and his or her social environment or on the child's independent experimentation, etc.) in children's minds. Some of these 'seeds' seem to be 'provisional' (that is, reflecting most recent and unexpected results of scientific studies), others still look like naive generalizations. But the sheer variety of views shows that the˙

area reflected in this dialogue is, perhaps, one of the domains in children's minds that is least affected by the contemporary scientific views and education the fact that could hardly surprise us if we bear in mind the variety of conflicting views on human development which exists in contemporary psychology and which, if put in Vygotsky's terms, maintains a permanent 'crisis in psychology.'

Dialogue 2. Freedom
The aims of the dialogue were to establish to what extent children were able to realize and express verbally (1) the feeling of being in control over their own voluntary action, (2) the fact that motives and wishes that force a person to act voluntarily are not themselves deliberately produced by the person, (3) the fact that a person is not responsible for his or her immoral wishes but is responsible for the implementation of the wishes, provided he or she does it deliberately, (4) the fact that the feeling of moral remorse appears if immoral action is done, (5) the fact that the freedom of moral action is based upon a person's moral self-image and not upon external incentives.

The questions were as follows:

1. Please, lift your hand up, o.k.? Tell me, was it yourself who lifted the hand up?

2. And can it be the case that it only seems to you that it˙ were yourself who lifted your hand up but in reality, it was done by a little man who is sitting in your head and pulling strings which makes you move your hands, your legs, do something and think something. It seems to you that it is yourself who does all this but in actual fact it is this little man who is controlling you. Can this be the case?

3. Can your brain be viewed as such a little man?

4. Therefore, if you wish to lift your hand up you do this, don't you? And if you don't wish you don't do this, right?

5. And what about these wishes of yours when you wish to lift your hand up or to eat where do they appear from?

6. What do you think, is this yourself who make your wishes appear or disappear or they appear in you independently and without your active involvement?

7. Tell me, is it yourself who are in a control of your wishes and actions or it is your wishes that control your actions and you merely do what your wishes order you to do?

8. For instance, if you bet with somebody that you will not eat for the whole day and you got hungry, can you do so that your hunger will disappear or you cannot?

9. And if you are thinking of something right now, for instance, you are thinking about an elephant, can you make yourself not to think of the elephant now, or you cannot?

10. And if a nasty dog is chasing you and you are scared, can you make yourself not to be scared or you cannot?

11. So, who controls whom: is it yourself who control your wishes and feelings or it is your wishes and feelings that control your actions?

12. Let's imagine that you see a smaller child than you with a nice toy in his/her hands and you feel that you wish to take the toy away from the child, is it your fault that you have such a wish or it isn't? Why?

13. And if you snatched the toy away from the child, is it your fault that you snatched it away or it is not? Why?

14. And if you broke a nice porcelain vase and you feel like deceiving your parents about it, is it your fault that you have such a feeling you it isn't?

15. And if you told lie about who broke the vase, is it your fault that you told lie, or it isn't?

16. Imagine, for instance, that you feel like taking the nice toy from the smaller child, but you didn't do this. Why didn't you do this?
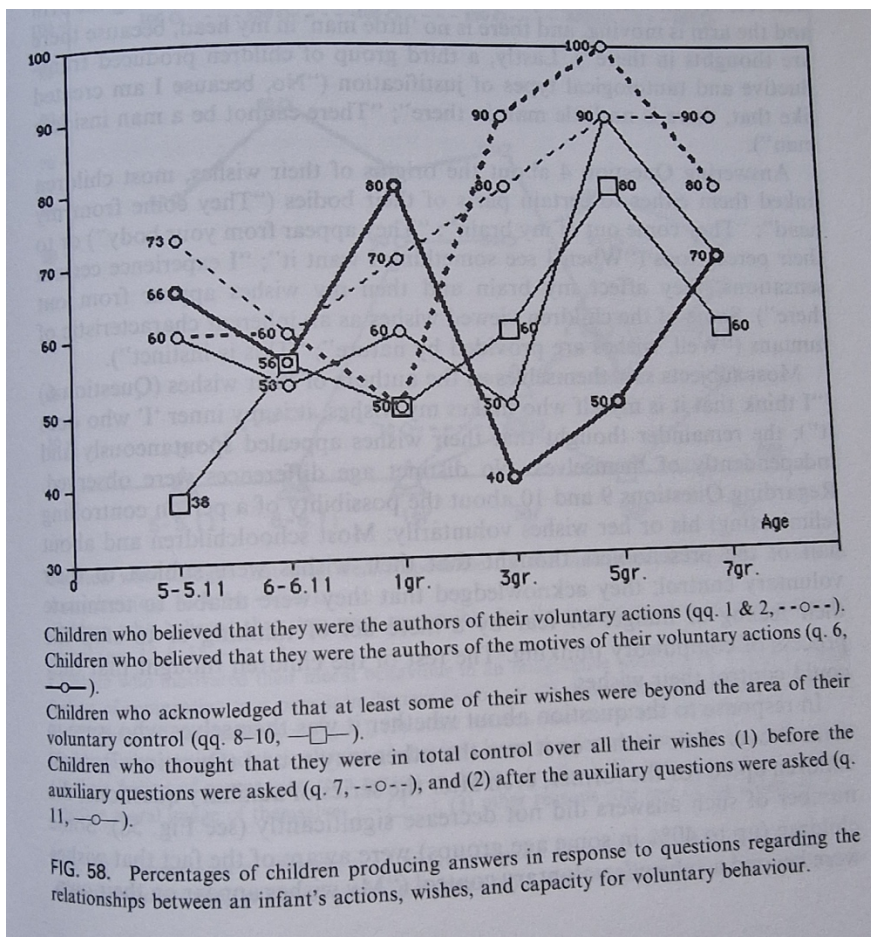
17. And if you knew that nobody never ever would find out that you took the toy away from the child and nobody will punish you for this, would you take the toy away? Why?

18. Imagine that you go alone the street and see a nice watch lost by somebody, would you keep it for yourself or bring it to the police? Why? Would you be sorry to stay without the watch if you bring it to the police?

19. And if you see that a pack of your favorite sweets fell out from the truck that brought goods to the local shop, and nobody noticed it except from you, would you keep the pack for yourself or bring it back to the shop? Why? Would you feel good or bad if you brought it back to the shop? Why?

Two major problems were addressed in this dialogue: the relationships between freedom and voluntary action, and the relationships between personal freedom and moral behaviour. Regarding the first problem, the results showed that most of the subjects of all age groups viewed themselves as being the authors of their voluntary actions (see Fig.58, questions 1 and 2). They denied that there was a 'little man' in their heads who was in the control of their actions and gave two types of justifications. Some of the children thought that freedom of action was a capacity inherent to every human being ('No, there isn't anybody who would control my actions Why? Because it is only dolls are like that.' 'No, because I am a real human being.' 'I don't think

somebody can control my actions, because this little man in the head it can only be in fairy tales; it is in the nature of humans that a person can move his hands, legs, can walk and speak...'). Children who produced arguments of this type acknowledged that the brain could be viewed as such 'little man in the head' (question 3), but they used to comment on this that body movements and even brain functioning were yet under the control of their thinking ('This is the human mind...the mind does it.' 'This is human thoughts...they give the signals.' 'It has long been proved that there is not any 'little man in the head', there is just the brain. - But your brain can't we view it as such a 'little man'? We can...well, no, we can't, because it's me who is in the control over my brain, I give the signals and my brain only transmits them.'). Other children justified their judgements˙ by referring to their special feeling of being free in their actions ('No, nobody controls me, because I can feel that it was myself who did it.' 'I can feel that it is myself who is lifting the arm and the arm is moving, and there is not any 'little man' in my head, because there are thoughts in there.'). Lastly, the third group of children produced transductive and tautological types of justifications ('No, because I am created like that, there is no any little man in there.' 'There cannot be a man inside a man.').

Children who believed that they were the authors of their voluntary actions (qq. 1 & 2, - -o- -).
Children who believed that they were the authors of the motives of their voluntary actions (q. 6, —o—).
Children who acknowledged that at least some of their wishes were beyond the area of their voluntary control (qq. 8–10, —□—).
Children who thought that they were in total control over all their wishes (1) before the auxiliary questions were asked (q. 7, - -o- -), and (2) after the auxiliary questions were asked (q. 11, —o—).

FIG. 58. Percentages of children producing answers in response to questions regarding the relationships between an infant's actions, wishes, and capacity for voluntary behaviour.

Answering question 4 about the origins of their wishes, most children linked them either to certain parts of their bodies ('They come from my head.' 'They come out of my brain.' 'They appear from your body.') or to their perceptions ('When I see something I want it.' 'I experience certain sensations, they affect my brain and then my wishes appear from out there.'). Some of the children viewed their wishes to be the inherent characteristic of man ('Well, wished are provided by nature.' 'This is instinct.').
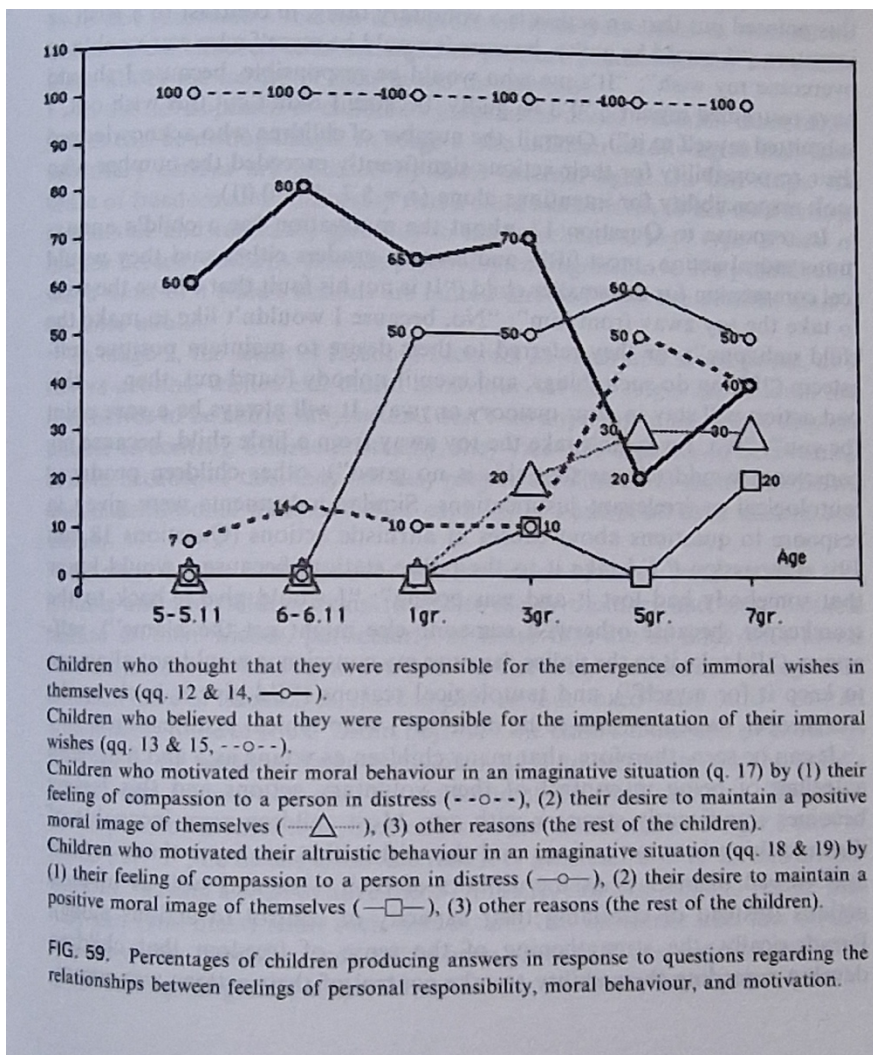
Most subjects viewed themselves to be the authors of their wishes (question 6). ('I think that it is myself who makes my wishes, it is my inner 'I' who does it.'); the rest of the children thought that their wishes appear in them spontaneously and independently of themselves.' There weren't distinct age differences observed. Regarding questions 9 and 10 about the possibility for a person to control (eliminate) his or her wishes voluntarily most schoolchildren and about a half of preschoolers thought that their wishes were subject to their voluntary control; they acknowledged that they were unable to terminate their feeling of hunger or fear by a sheer act of thinking or to stop the

process of compulsory thinking. The rest of the children thought that they could control their wishes.

The question about whether it was themselves who were in a control over their wishes or it was the other way round (question 7), most children opted for the first possibility; even after the series of auxiliary questions the number of such answers decreased insignificantly (see Fig. 58). Yet in every age group there were children (up to 40 percent in some age groups) who were aware of the fact that wishes were beyond subject's voluntary control ('My wishes would appear on their own, but whether I satisfy them or not - this depends on me.' 'My wishes are independent from my actions.'). This result is in concordance with data reported by Inagaki & Hatano (1993) who found that a considerable number of four and five-year-olds were able to distinguish between bodily and mental properties realizing at the same time that activities of internal organs of a person are independent from the person's intentions.

Regarding questions 12 and 14 about the relationships between the emergence of wishes and personal responsibility for that (see Fig.59), most preschoolers and schoolchildren of the 1st and 3rd grades viewed themselves as responsible for the emergence of their immoral desires ('I would be responsible, because it is forbidden - ˙ to take things away that do not belong to you.' 'I think I would be the one to blame, because it would mean that I was unable to educate myself good enough to be the honest person.'). The rest of the children viewed themselves not to be responsible for the emergence of immoral wishes in them (increase, 6 years to 11 years/5gr., $\chi^2 =7.11$, $p<.01$); most justification came down to the claim that immoral wishes are something that is independent from the subject's conscious control ('No, I wouldn't be the one to blame because wishes come and go on their own.' 'No, I am not responsible for my bad feelings.' 'No, I would not be responsible, because I just wish, I cannot do anything about it, but I would go away and not take the toy from a little child.'). At the same time all the children acknowledged that they would be responsible for the implementation of their immoral wishes (questions 13 and 15); those of the children who produced justifications to this view mostly pointed out that an action is a voluntary thing in contrast to the wish or intention ('I would be guilty, because it would be myself who was unable to overcome my wish.' 'It's me who would be responsible, because I should have restrained myself.' 'I'd be guilty, because I didn't cut this wish out, I submitted myself to it.'). Overall, the number of children who acknowledged their responsibility for their actions significantly exceeded the number of those who took responsibility for mere intentions ($z = 5.7$, $p<.01$).

Children who thought that they were responsible for the emergence of immoral wishes in themselves (qq. 12 & 14, —o—).
Children who believed that they were responsible for the implementation of their immoral wishes (qq. 13 & 15, - - o - -).
Children who motivated their moral behaviour in an imaginative situation (q. 17) by (1) their feeling of compassion to a person in distress (- -o- -), (2) their desire to maintain a positive moral image of themselves (---△---), (3) other reasons (the rest of the children).
Children who motivated their altruistic behaviour in an imaginative situation (qq. 18 & 19) by (1) their feeling of compassion to a person in distress (—o—), (2) their desire to maintain a positive moral image of themselves (—□—), (3) other reasons (the rest of the children).

FIG. 59. Percentages of children producing answers in response to questions regarding the relationships between feelings of personal responsibility, moral behaviour, and motivation.

In response to question 17 about the possible motivation of children's anonymous moral action, most 5- and 7- graders either named compassion that they would have with the smaller child ('It is not his fault that I have the wish to take the toy away from him.' 'No, because I wouldn't like to make the child unhappy.') or referred to their desire to maintain positive self- esteem ('If you do such things, and even if nobody would find out, then...this bad action will stay in your memory anyway. It will always be a sore for you.' 'No, I wouldn't take the toy away from a little child, because my conscience would tell me that this is no good.'); other children produced tautological or irrelevant justifications. Similar judgements were given in response to questions about causes of altruistic actions (questions 18 and 19): compassion ('I'd bring it to the police station, because I would know that somebody has lost it and was crying.' 'I would bring it back to the store, because otherwise they would punish the driver.'), self-esteem ('I'd bring it to

the police, because my conscience would
not allow to keep it for myself.') and tautological reasons ('I'd
bring it back to the store, because it has to be done so.') were
typical justifications.

It can be seen therefore that even many children as young as
5- and 6- years- old develop the feeling of being free in their
voluntary actions, and this feeling becomes significantly stronger
with age. At that, most of the children were incapable of
distinguishing between actions and wishes that motivate the˙
actions and viewed themselves as authors of their wishes as well
as of their actions (instead of confining their capacity of
control to actions only). Paradoxically, the strengthening of the
sense of freedom that children developed regarding their
capabilities to take control over their actions was accompanied
with the growing awareness of the spontaneous nature of wishes; as
a result of the confusion between actions and wishes, many
children acknowledged that they were unable to deliberately
produce or terminate some of their wishes, yet they thought that
they could control the wishes.

This illusion of being in control over their wishes persisted
in most preschoolers and primary schoolchildren (1and 3- graders)
even when the voluntary action was put in a context of moral
relationships, so that the children viewed themselves to be
responsible for the emergence immoral wishes in them. However, the
illusion disappeared in most older schoolchildren (5and 7-graders) most of whom
revealed no difficulties in distinguishing
between actions and wishes that motivate them and acknowledged
that they were not responsible for the emergence of immoral wishes
in them. Part of the children even managed to produce
psychologically reasonable ideas about the nature of their moral
motivations.

Basically, in the development of children's judgement about
freedom three major stages could be distinguished. In Stage 1
children are easy to agree that their voluntary actions are
initiated by some external agent. In this stage, the sense of
freedom and authorship that a child has over his or her own˙
actions is yet unstable and can easily give way to the 'mechanical
toy' type of view on himself or herself. Perhaps, this instability
of the sense of freedom is a psychological recession of early
childhood when most of children's actions were indeed directed
from the outside (mainly, by close adults).

In Stage 2, the sense of freedom becomes stronger and more
global, it covers actions, wishes and moral behaviour. At this
stage, the children feel themselves to be active subjects and
don't see anything in them that would go beyond their overwhelming
capacity of control. Characteristically, they view this capacity

to be a sheer mental action, and, because of that, they fall an easy prey to the illusion of the self-sufficient and unconditional nature of their capacity to control all their actions and wishes.

In Stage 3 this homogeneous and harmonic sense of freedom runs into trouble and the children began to realize the involuntary and unpredictable nature of their wishes, particularly of those that are at odds with moral norms. Inside the homogeneous and 'subjectively translucent' image that children have of themselves there appear certain 'hard' and 'stiff' entities which seem to have come 'from beyond' the child's mind and personality. The sense of personal freedom, which used to permeate all the child's actions and wishes, shrinks to cover only the child's actions. The child develops the awareness that part of his or her wishes is no longer a part of his or her 'I'; he or she discovers that it is possible to have certain wishes without 'having a wish to have them.' Finally, children realize that they have to (and can) resist to this kind of wishes, and this resistance too has certain specific wishes behind it (such as 'to be in peace with one's conscience', 'to avoid feeling of guilt', etc.).

The stages distinguished are not strictly linked to the particular ages. Thus, although answers of most preschoolers could be covered by Stage 2, a considerable part of the children agreed that their voluntary actions could be initiated and controlled externally (Stage 1), and some denied that they were responsible for the emergence of immoral wishes in them (Stage 3). Judgements related to all three stages could be found in answers produced by schoolchildren and even within the answers given by one and the same child. Nevertheless, certain age tendencies can be traced. The data show, for instance, that most senior preschoolers and primary schoolchildren (1and 3- graders) produced answers that would fit Stage 2, whereas among judgements given by older schoolchildren (5and 7- graders) the predominant type of answers was that of Stage 3.

It can be further assumed that the transition from Stage 1 to Stage 2 would be an indicator of the child's departure from the emotional world developed in early childhood (with the overwhelming feeling being that of dependence from other people) and the development of the sense of autonomy on the general background of physical, social and psychological growth. At the same time, the increase of social and moral requirements imposed on a school age child and the emergence of competing and conflicting wishes gradually brings about the growing awareness of the independent and uncontrollable nature of wishes and impulses in contrast to actions which, although to various extent, can be voluntarily controlled.
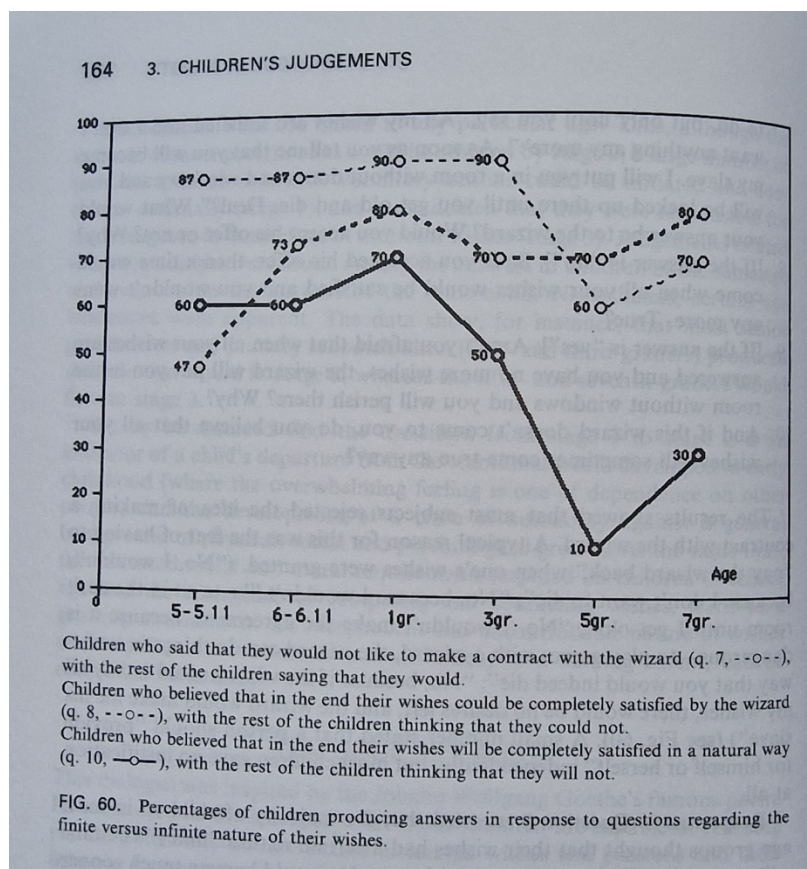
Dialogue 3. Faust
The dialogue was inspired by the Johann Wolfgang Goethe's famous poem. Its aims were to determine to what extent children were capable of realizing of (1) potentially infinite nature of human wishes and passions and their inherent incompleteness, (2) the inherent impossibility for an individual to accomplish all his/her desires.

The following questions were asked:

1. Tell me, do you want something at the moment? What do you want?
2. Do you want that you always have your favorite sweets in abundance?
3. Do you want to become a famous author, a great scientist or an outstanding artist when you are grown up?
4. Would you like to have an opportunity to travel around the world and see all the countries and cities?
5. Would you like to be very handsome and good looking so that all the people would like you and admire you?
6. Would you like to be the most intelligent person in the world and know lots of things about space and nature, about people, animals and plants?
7. Well then, let's imagine that a wizard came to you and said: 'I am going to accomplish all and any of your wishes whatever and however multiple they were, I will do everything you want me to do but only until you say 'All my wished are satisfied and I don't want anything anymore'. If and as soon as you tell this and will not wish anything more you will become my slave. I will put you in the room without doors and windows and you will be locked there until you get old and die. Deal?' What would you answer to the wizard? Would you accept his offer or not? Why?
8. (If the answer is 'no') So, if you accepted the offer than a time would come when all your wishes would be satisfied and you would want anything no more?
9. (If the answer is 'yes') Are you not afraid that when all your desires will be accomplished, and you will have no more wishes the wizard will put you in the room without the windows and you will perish there? Why?
10. And if this wizard will never come to you, do you believe that all your wishes will be accomplished sometimes anyway?

The results showed that most of our subjects rejected the perspective of making the contract with the wizard. Typical ground for that was the fear of the inevitable perspective to 'pay

back' when all the wishes are accomplished ('No, I wouldn't, because I don't want to die.' 'No, because I wouldn't like to sit in the dark room until I get old.' 'No, I wouldn't make the agreement, because it is dangerous to play games with a wizard, the wizard can turn things in such a way that you would die indeed.' 'No, because if the wizard would satisfy all my wishes,˙ there would be no desires left, and the wizard would make me his slave.')(see Fig.60). There were a few children who grounded their refusal by the fact that a person should 'provide for himself or herself' independently, but most children gave no justification at all.

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Children who said that they would not like to make a contract with the wizard (q. 7, - -o- -), with the rest of the children saying that they would.
Children who believed that in the end their wishes could be completely satisfied by the wizard (q. 8, - -o- -), with the rest of the children thinking that they could not.
Children who believed that in the end their wishes will be completely satisfied in a natural way (q. 10, —o—), with the rest of the children thinking that they will not.

FIG. 60. Percentages of children producing answers in response to questions regarding the finite versus infinite nature of their wishes.

Responses to question 8 revealed that the majority of children in most age groups thought that their wishes had a certain natural limit ('The time will come when I'd have wishes no more, and it would happen much sooner than I'd like to.'); a significantly smaller number of children thought that their wishes had no limits ('No, human wishes can't stop, they are infinite.' 'Perhaps, I will always have some unsatisfied wishes.'). Lastly, most preschoolers and 1- graders were sure that their wishes would be accomplished completely in due course in a natural

way (question 10; decrease, 7 years/1gr. to 11 years/5gr., $\chi 2=6.04$, p<.02).

It can be concluded from the data that the awareness of the potentially infinite nature of human wishes is achieved by only a few children within the studied age range, and the number of such children doesn't grow with age. The statements of many 5- year- olds about the infinite nature of their wishes (question 8) were at odds with their refusal to make a contract with the wizard what undermines the reliability of such statements.

The justifications given in response to question 7 were very much alike through age span. Those children who thought that their wishes were insatiable and who wished to make the agreement with the wizard demonstrated that they realized the continuous and infinite nature of human wishes; however, the number of these children was surprisingly small, despite the fact that certain areas of children's culture directly point to the fact that human wishes are fundamentally insatiable. Clearly, all of the children involved in this study new a popular Pushkin's poem 'The tale of a fisherman and a fish' and other similar stories, however, only one child made a reference to tales of this kind in this study ('Well, there are no limits for human wishes...There are even fairy tales about this: you do good things to a person, and the person wants more and more').

Dialogue 4. Unconscious
The aims of the dialogue were to determine to what extent children were able to appreciate the presence of the following unconscious psychological mechanisms: (1) projection (questions 1- 4), (2) rationalization (questions 5- 10), (3) defense (questions 11- 14).

In previous studies (Chandler, Paget & Koch, 1978; Dollinger & McGuire, 1981) certain age trends were suggested in defense understanding. Thus, Chandler et al. (1978) told preoperational, concrete operational and formal operational children eight stories in which eight commonly described mechanisms of psychological defense were portrayed (such as turning against the self, denying, displacing, rationalization, projecting, introjecting, repressing one's own feelings) and asked to complete the stories. They found that preoperational children failed to understand defensive transformations, concrete operational children could only understand defenses involving inverse and reciprocal operations, and formal operational subjects were able to understand defenses that involved second order transformations ('operations upon operations').

Going further along this line, Dollinger & McGuire presented to children of 4 to 14 years of age seven stories devised to

portray defensive strategies used by story- characters. The stories depicted children characters who employed such defense mechanisms as repression, denial, displacement, projection, rationalization, somatization, and self- blame. The subjects were asked to explain why the story characters acted as they did. It was found that older children revealed better understanding of defense mechanisms, especially with regard to rationalization test on which 10- 14-year-olds performed twice as good as did younger children, and displacement task on which a significant shift in understanding was observed in an earlier age (around 7). It was also found that children who better understood defense mechanisms performed better on Chandler's modified test of egocentrism (i.e., were less egocentric) then those with poor understanding of defense.

While the studies described revealed certain important features in the development of children's conceptions of defense, they were limited in several respects and challenged further investigation. For instance, in Dollinger & McGuire's study such typical defense mechanisms as perceptual defense (as not letting into an individual's mind objects and events which are in the individual's full view but contradict to his or her concepts and attitudes) was not included and rationalization test did not involve questions about one major feature of rationalization, that is it's subconscious character (for instance, a person can reinterpret events in his or her favor quite deliberately which would not involve rationalization).

To fill this gap, in Dialogue 4 of the present study a stress was made on perceptual subconscious defenses (projection and defense proper) and on the child's understanding of the fact that rationalization involves a person's acting without the person being aware of the real determinants of the actions. Another new aspect of this study was that children not only discussed actions of story characters, but also were asked whether they themselves sometimes behave in the same 'strange' way as did the characters of the stories they had been told.

1. Tell me, please, what is this (a card taken from Rorschach ink- blot test is shown)? What does it look like?

2. Imagine that one night when you were asleep you got very hungry. What do you think you will see in you dream?

3. And if you were shown this picture (the same Rorschach card is shown) when you were very hungry and asked what this picture looked like, what would you answer?

4. And if something scared you very much, and at that moment you were asked what this picture looked like, what would you answer?

5. Imagine that one night when you were asleep a wizard (for older children a hypnotizer) came to you and made a spell (suggested to you) that in the morning when you go to school you would pick up three pebbles from the kerb and put them into your pocket. Now, the morning comes, you get up and go to school as usual. What will you do on your way to school?

6. Why would you pick the pebbles up?

7. Will you know that it was the wizard (the hypnotizer) who made you to pick up the pebbles?

8. And if, while you were picking up the pebbles, somebody asked you why you were doing this, what would you answer?

9. And if this wizard (the hypnotizer) made a spell (suggested to you) that you should refuse to eat your breakfast in the morning, would you refuse or not? Why?

10. And if you were asked in the morning about why you refused to eat your breakfast, what would you answer? Would you feel really hungry or not?

11. Listen, one day I asked a boy named Peter to do one simple task for me and asked another boy named Viktor to watch whether Peter was doing the task correctly. Viktor noticed and reported all the mistakes that Peter had made. Then I asked the teacher to do the same task and Viktor had to watch whether she did it all right. The teacher made the same mistakes that Peter had made but Viktor failed to notice the mistakes although he was˙ looking very carefully. Why did Viktor notice mistakes that Peter made and failed to notice the same mistakes in the teacher?
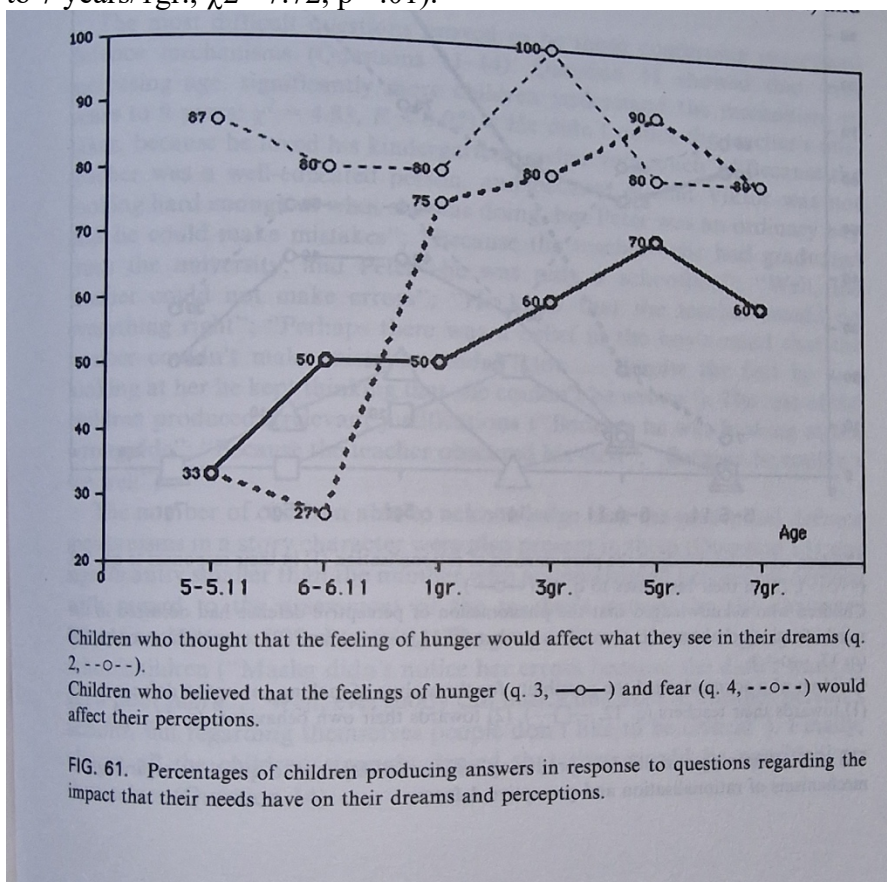
12. And if you were on Viktor's place would you notice mistakes that your teacher made, or you would not?

13. Another day I asked a girl Masha to watch how another girl from the same classroom did that task. Masha noticed all the mistakes that another girl had made. After this I asked Masha to do the same task herself. Masha made the same mistakes that the girl had made but she didn't notice them and thought that she did everything all right. Tell me, why did Masha notice all the mistakes that another girl had made but failed to notice the same mistakes in herself?

14. If you were on Masha's place would you notice your mistakes or you would not?

It turned out that most of the children of all ages acknowledged the fact that hunger affects dreams; they expected to see in their dreams various food products or that they were eating something (Fig.61). Children who didn't realize or denied this either named objects irrelevant to eating or told that this wouldn't affect their dreams ('I would see something in my dream, but not necessarily food.').

   The comparison between children's answers to questions 1,3 and 4 showed that more than 30 percent of preschoolers and most schoolchildren modified the names of the ambiguous object according to the need they were asked to imagine: if a neutral question (q.1) evoked in children images like 'a skin', 'a tree',˙ 'a cave', 'a fresco', etc., then in response to question 3 the children named food objects ('ice cream', 'candies', 'salad', 'meat', etc.) and in response to question 4 they named scaring objects ('a snake', 'a skull', 'a monster'.); the rest of the children either repeated associations given in response to Question 1or produced irrelevant associations (Fig.58). In sum, among schoolchildren the number of answers revealing the understanding of the possible impact of hunger and fear upon apperception increased with age, for fear significantly (6 years to 7 years/1gr., $\chi 2= 7.72$, $p< .01$).

Children who thought that the feeling of hunger would affect what they see in their dreams (q. 2, - -o- -).
Children who believed that the feelings of hunger (q. 3, —o—) and fear (q. 4, - -o- -) would affect their perceptions.

FIG. 61. Percentages of children producing answers in response to questions regarding the impact that their needs have on their dreams and perceptions.

   In response to question 5, all children acknowledged (some of them after a brief discussion with the experimenter) that they will pick the pebbles up and referred to the hypnotic state (or the magic spell) as the cause for this (Question 7) (Fig.62). Answering question 8 a considerable number of children produced judgements that revealed the children's ability to realize the rationalization mechanism ('I would tell the person that I would

just like to play with the pebbles.' 'I'd say I'd like to examine the pebbles, whether they are nice or not.' 'Well, I would think that I did this in order to show my friends that I was collecting various kinds of granite.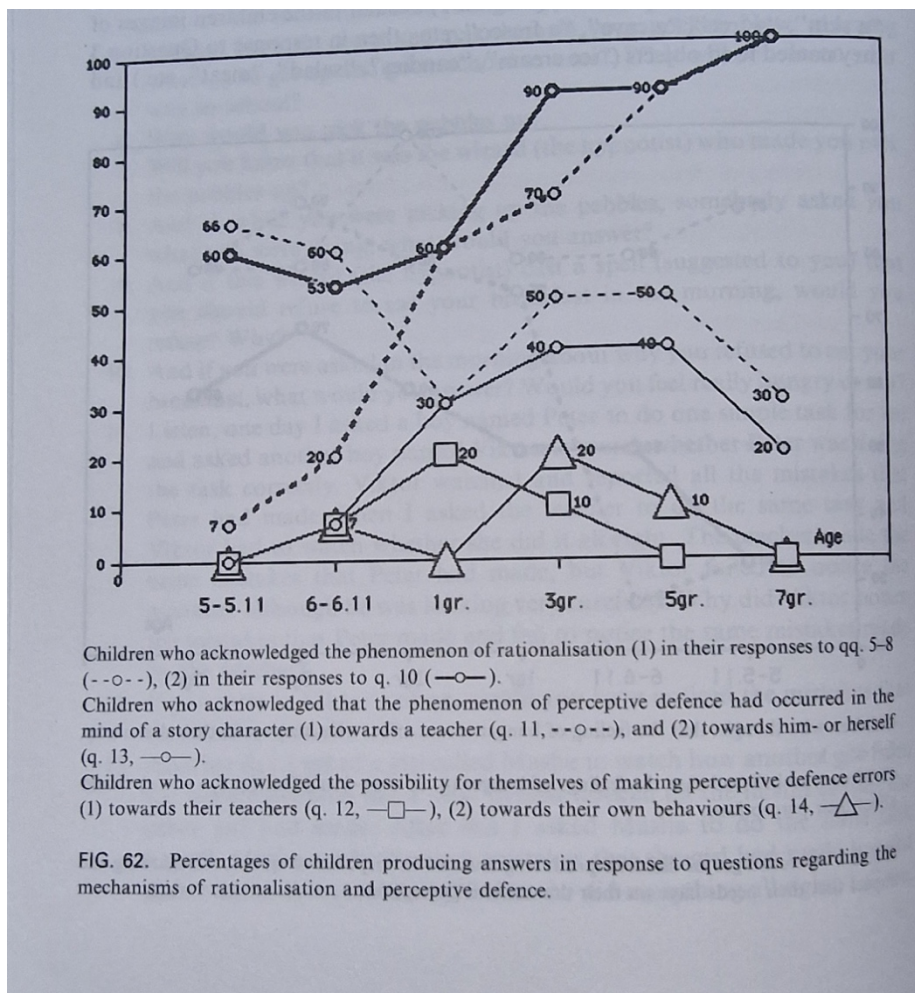'); there was not a clear age dynamics. The rest of the children revealed no understanding of rationalization ('I would tell the person that I didn't know why I was doing this.' 'I'd say that I needed the pebbles.' 'I'd tell that I just wanted them.'); even a special prompting by the experimenter didn't affect children's answers ('But why would you want the pebbles, what for? - Well, I'd simply pick them up... how can a person ground an action if he doesn't know that he was hypnotized.').

The number of children who showed understanding of the rationalization mechanisms when they were asked question 10 significantly increased with age (6 years to 13 years/7 gr., $\chi 2$ =5.06, p<.05); at that, most schoolchildren confirmed that in reality they would have hunger, thus revealing the awareness of the discrepancy between the state of their organisms and the state of their minds (There would be the feeling of hunger, because you want to eat, but you can't eat because the hypnotizer had told you that you shouldn't.').

The most difficult questions proved to be those about perceptual defense mechanisms (questions 11- 14). Yet, question 11 yielded an increasing number of children revealing that they understood the mechanisms (6 years to 9 years/3gr., $\chi 2$=4.83, p<.05) ('He didn't notice the teacher's mistakes, because he loved his kindergarten teacher very much.' 'Because the teacher was a well educated person, and because of that Viktor was not looking strong enough what she was doing, but Peter was an ordinary boy and he could make mistakes.' 'Because the teacher she had graduated from the university, and Peter he was only a schoolboy.' 'Well, the teacher could not make errors.' 'He knew that the teacher would do everything in a right way.' 'Perhaps, there was a belief in the boy's mind that the teacher couldn't make mistakes, and Viktor... despite he was looking at her he kept thinking that she couldn't be wrong.'). The rest of the children produced irrelevant justifications ('Because he was looking at the wrong side.' 'Because the teacher obscured his view.' 'Because he couldn't see well.').

Children who acknowledged the phenomenon of rationalisation (1) in their responses to qq. 5–8 (- -o- -), (2) in their responses to q. 10 (—o—).
Children who acknowledged that the phenomenon of perceptive defence had occurred in the mind of a story character (1) towards a teacher (q. 11, - -o- -), and (2) towards him- or herself (q. 13, —o—).
Children who acknowledged the possibility for themselves of making perceptive defence errors (1) towards their teachers (q. 12, —□—), (2) towards their own behaviours (q. 14, —△—).

FIG. 62. Percentages of children producing answers in response to questions regarding the mechanisms of rationalisation and perceptive defence.

The total number of children capable of acknowledging the presence of the perceptual defense mechanisms in a story character with respect to himself or herself (question 13) was significantly smaller than the number of those who acknowledged perceptual defense regarding the assessment of teacher's actions by the character (question 11) (z=5.09, p<.01); the number increased slightly among schoolchildren ('Masha didn't notice her errors because she didn't want to get a poor mark.' 'Well, everybody can notice mistakes in another person's actions, but regarding themselves people don't like to be critical.')

Lastly, almost all children strongly denied that they would be uncritical to themselves (question 14).

As it can be seen from the questions, a characteristic feature of this dialogue was its prompting structure intended to examine whether the children were able to get the hints about some unconscious psychological mechanisms which were incorporated into the questions. It was not certain established pieces of knowledge˙ or capacities of the children's minds that were tested in this

dialogue, but rather the presence of some 'fertile ground' in the minds of children that would allow them to grasp the prompting and achieve the understanding 'in the very process of questioning.'

The data showed that the unconscious mechanisms which proved to be most accessible for the children was the effect that our needs have on our dreams. The apperception and rationalization mechanisms were considerably more difficult to get to grips with, with the perceptual defense being the most difficult of all to understand. This 'hierarchy of accessibility' could hardly be explained by semantic causes, such as the differences between the questions' wordings. That this was the case can be seen, for instance, from the fact that wordings of questions 2 and 3 which contained the allusion of the impact of the person's needs on the person's dreams and apperception were identical, however, the average number of correct answers was significantly larger with respect to the former than to the latter ($z=4.3$, $p<.01$); and vice versa, questions that tested children's understanding of apperception and rationalization mechanisms were asked in different ways but yielded similar answers. It seems more likely that the 'degree of difficulty' of the questions reflected real differences of how the psychological mechanisms tested were represented in children's minds.

Clearly, the children may have had an opportunity to observe the effects that their needs had on their dreams more often than similar affects their needs had on their perception which occur quite rarely indeed. The opportunities to observe rationalization and perceptual defense are rare too. What was surprising was not many children's failure to appreciate the mechanisms but the fact a considerable number of children did reveal a certain degree of appreciation, which confirmed the earlier reported data on early children's understanding of defense mechanisms (Dillinger & McGuire, 1981).

The fact that a number of children who were able to find adequate explanations for apperception, rationalization and perceptual defense mechanisms increased significantly among schoolchildren can be accounted for either by the expanding of the children's psychological experience or by their growing capacity to 'self- analysis', that is the capacity to 'look inside one's mind.' There is no doubt that in comparison to the preschool age, in the school age the necessity for a child to critically assess erroneous actions of his or her peers or teachers, as well as the child's own mistakes, increases, and so does the frequency of 'perceptual defense' errors that can affect the child's judgements. It should also be born in mind that the 'understanding' of unconscious mechanisms that most children revealed was in no way a complete one. However, even the

children's capacity to catch the hint and express verbally some behavioral outcomes of the unconscious processes shows that the children of the age range involved have a much more sophisticated view of their mental life than it used to be commonly assumed.

Dialogue 5. Inner world
The dialogue aimed to determine to what extent children were able to realize and express verbally (1) certain attributes of their mind, and (2) the difference between the 'inner worlds' of a human being and those of animals, plants and inanimate objects. Although in psychological studies children were often asked questions about their dreams, emotions, and feelings, as well as about whether certain objects were alive or not, the questions were formulated in a way which used to put the child in a position of the external judge and observer rather than in a position of a person who is looking 'inside his or her mind'. So, in this dialogue the attempt was made to 'peep into' his or her mind 'from inside', as well as to encourage the child to put him or herself in a position of subhuman creatures and objects

1. Let's imagine that we enter a dark and unknown room, O.K.?. We switch our torch on and its light beam illuminates various objects like a table, a sofa, an old cupboard, etc. And now let's imagine that your mind and your soul are this dark room. We open the door, enter, switch the torch on....What do you think we'll see?
2. Tell me, if you are hungry what kind of feeling do you have?
3. And if you fell down and got hurt what kind of feeling do you have?˙
- And if you are asleep and see a dream , what kind of feelings do you experience?
- And if you are in the process of searching for a solution of a difficult task and you can't find one, what kind of feeling would you have?
- And if you committed something bad, for instance, you deceived your friend, what kind of feeling would you have?
4. Tell me now, if we take not the human mind but the mind of an animal, for instance, a dog's mind, do you think that it feels something if it is punched? What does it feel?
- And if the dog is eating a tasty meaty bone, what do you think it feels?
- And if the dog did something bad, for instance, ate a piece of meat that his master had prepared for himself, what do you think the dog can feel?

5. And now let's talk about the mind of a tree. If the tree is being cut its branch off, does it feel anything? What do you think it feels?
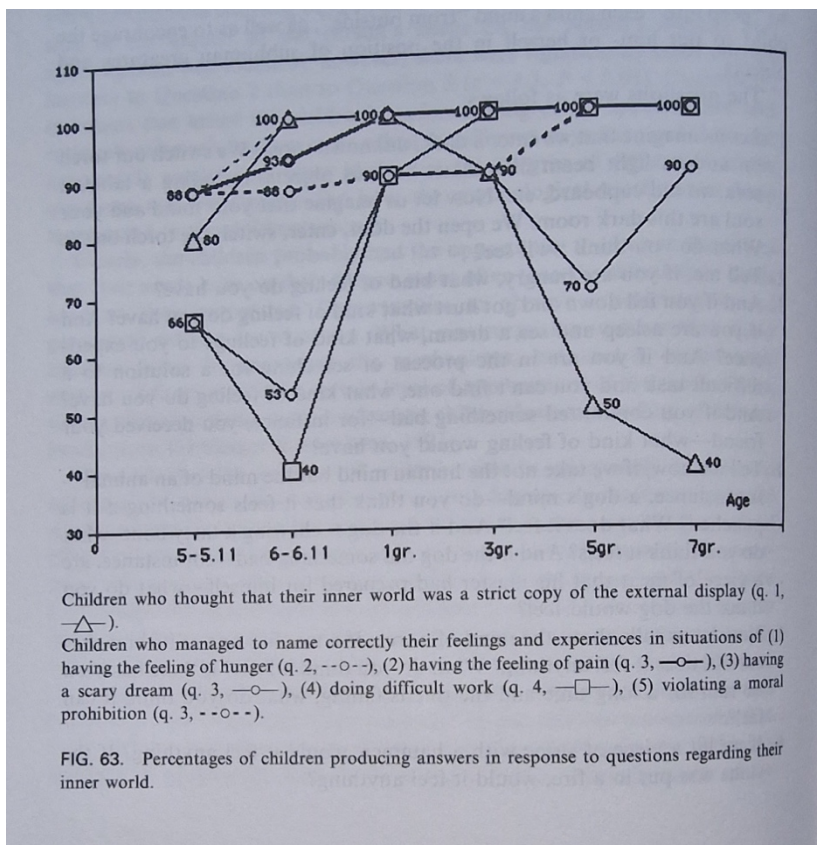
- If there has been no rain for a long time and the tree is fading, what do you think it can feel?

6. If we kick a piece of stone with a hammer, would it feel anything or it would not?

- If the stone is put into fire, would it feel anything or it would not?

In response to Question 1 most children described their inner mental world by analogy with the external world (Fig.63). The˙ children thought that one would see in their minds the room and the objects that were in front of them in the moment of interrogation. At that, one part of the children viewed the images they had in their minds as mere copies of the external world, others treated mental images as transformed and changed reflections of what they saw outside ('It would depend on my mood...perhaps, we would see the same lounge...But if I had a different mood, then the image would be different.' 'Well, perhaps we would see the chessboard...But if you are hungry, then it would seem to you that there is a vase with some fruits in it.' 'Well, we would see some unknown objects, this sofa, for instance...but it would be somehow deformed...').

It was only among 5- and 7- graders that the majority of children viewed their inner world not as a mere analogy of the external world (no matter whether it was an identical copy or a deformed one) but as something special ('Well, we would see something that is in my soul...some kind of my moods.' 'We would see what I am thinking at the moment.' 'Well, there would not be this furniture there, rather, there would be some of my strong impressions there and my feelings, and something shapeless, I can't tell you exactly what...what my will power is.' 'We would see some good traits and bad traits of mine.' 'Various feelings, my character, my attitudes toward everything.').
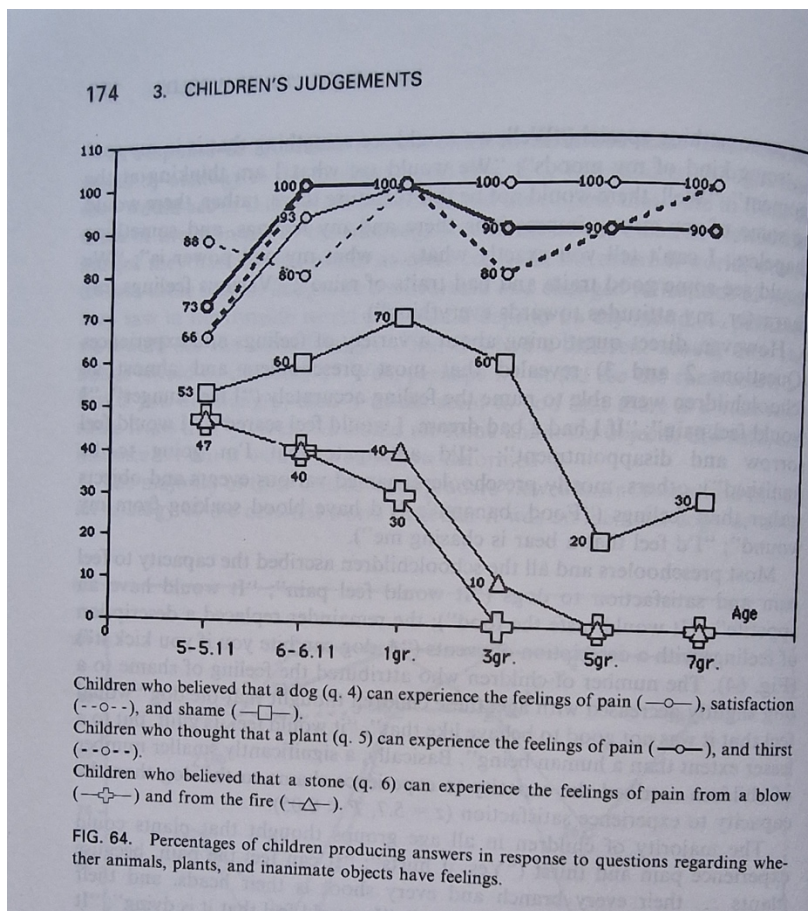
Children who thought that their inner world was a strict copy of the external display (q. 1, —△—).

Children who managed to name correctly their feelings and experiences in situations of (1) having the feeling of hunger (q. 2, --○--), (2) having the feeling of pain (q. 3, —○—), (3) having a scary dream (q. 3, —○—), (4) doing difficult work (q. 4, —□—), (5) violating a moral prohibition (q. 3, --○--).

FIG. 63.   Percentages of children producing answers in response to questions regarding their inner world.

However, direct questions about a variety of feelings and experiences (q.2 and q.3) revealed that most preschoolers and almost all schoolchildren were able to name the feeling accurately ('I feel hunger.' 'I would feel pain.' 'If I had a bad dream, I would feel scared.' 'I would feel sorrow and disappointment.' 'I'd anticipate that I'm going to be punished.'); others, mostly preschool children, named various events and objects rather then feelings ('Food, banana.' 'I'd have blood soaking from my wound.' 'I'd feel that a bear is chasing me.').

Most preschoolers and all schoolchildren ascribed the capacity to feel pain and satisfaction to a dog ('It would feel pain.' 'It would feel appetite.' 'It would feel taste of the food.'); the rest replaced the description of feelings by the description of events ('A dog can bite you if you kick it.') (Fig.64). The number of children who attributed the feeling of shame to a dog slightly decreased with age; these children thought that the dog 'would feel that it was not good to behave like that', 'it would feel its guilt, but to a lesser extent that a human being would feel.' Basically, a significantly smaller total number of children ascribed the capacity to experience shame to the dog than the capacity to experience satisfaction (z=5.7, p<.05).

Children who believed that a dog (q. 4) can experience the feelings of pain (—o—), satisfaction (- -o- -), and shame (—□—).
Children who thought that a plant (q. 5) can experience the feelings of pain (—o—), and thirst (- -o- -).
Children who believed that a stone (q. 6) can experience the feelings of pain from a blow (—✧—) and from the fire (—△—).

FIG. 64.   Percentages of children producing answers in response to questions regarding whether animals, plants, and inanimate objects have feelings.

The majority of children in all age groups thought that plants could feel pain and thirst ('Yes, it hurts.' 'It can feel the pain, because plants...their every branch and every shoot is˙ their heads, and their mouths, and their little hands and legs.' 'It would feel that it is dying.' 'It would feel that it needs water.'). The rest of the children refused to attribute the feeling capacity to a tree ('The real tree...it can feel nothing, it just fades. And if its branch is being cut? Still, it cannot feel anything, because it has no soul, no character.').

A considerable number of preschoolers and 1- graders thought that a stone could experience pain ('It would feel that it has been struck.' 'It would feel pain.' 'It would feel that it burns in the fire.'). The overall number of such children was, however, significantly smaller than that of the children who ascribed similar feelings to a tree ($z = 7.1$, $p < .01$), and most preschoolers and all subjects older than 7 denied that a stone could feel anything. This result seems to be in discordance with Piaget's (1983) data reporting that it was not until children reached 11- 12 years of age that they were prepared to restrict life to animals and plants only. However, the way Piaget asked his questions about origins of life (reproduced in subsequent studies, such as by

Laurendau & Pinard, 1962; Schwartz, 1980; Carey, 1985) was
directing the child's attention to the external manifestations of
life (such as feeding or spontaneous movements) rather than to the
'internal dimension' of alive creatures, and this may account for
the differences.

However, basically the results of the dialogue confirmed an
established fact that most children tend to identify their minds
and souls with images of external reality the phenomenon that
Piaget called 'realism of the child's thinking' (Piaget, 1983).
The children who revealed this phenomenon didn't use psychological
concepts in the descriptions of their 'minds' despite the fact
that most of them were able to name accurately their feelings when
asked directly in questions 2 and 3.

The second phenomenon revealed in this dialogue was that of
the anthropomorphic attribution of moral feelings to an animal and
the feeling of pain to a tree and a stone. This is another
demonstration of a highly conventional character of the borderline
which is drawn in contemporary European cultures between the
objects that have 'psychological dimension' and those which have
not. It appears that preschool children have a rather poor notion
of this borderline, however, they tend to learn it quite quickly
as they start attending schools. Thus, in most preschooler's and 1-graders' views a stone
unlike a dog and a tree - didn't have the
capacity to feel pain. Furthermore, most 5- and 7- graders thought
that the 'inner world' of a dog didn't include moral feelings. It
was just at this age that the number of children who viewed their
minds as mere copies of the external world dropped down
significantly.

Comparing the data received in this dialogue with those
reported in earlier studies (Piaget, 1983) we can see that the
children in the age range between 5 and 7 indeed revealed a
combination of two opposite points of view: on the one hand, they
viewed their internal worlds as copies of the external world (what
could be named 'the externalization of the mind'), and, on the
other hand, they tended to attribute the properties of the mind to
inanimate and even nonliving objects (anthropomorphizing of
objects). However, Piaget's description of these tendencies as two
sides of the same coin (the failure of the children to distinguish
between internal and external) doesn't seem very likely; rather,
these tendencies reflect two different trends working in
children's minds simultaneously. In so far as it concerns the
externalization of mind, it can be indeed the result of the
confusion between external objects and internal images of the
objects; this confusion in turn can be based on the confusion
between more fundamental distinctions, such as between entities
that have physical characteristics (location in space,

divisibility, etc.) and those that have not the distinctions that are very difficult to get to grips with for preschoolers (Subbotsky, 1994). As for the second phenomenon (the attribution of psychological characteristics to plants and nonliving objects), it can be based on a different type of confusion, namely, that one between objects that have psychological functions and those that have not. The borderline between physical and mental (or between mind and body, internal and external) isn't identical to that between objects which have minds (and, therefore, feelings, etc.) and those which have not: the acquisition of the first distinction by the child is tightly linked with the enrichment of the child's psychological experience (self- analysis and self- observation), whereas the second distinction is much more dependent on cultural conventions (carefully analyzed in cross- cultural studies, such as by Levy- Brühl, 1925) and is mainly imposed upon the child (and acquired by the child) through learning.

The differences in the underlying causes can, perhaps,˙ account for the temporal gap existing between the two phenomena. Indeed, if most 11- and 13- year- old children in this study were shown to be quite aware of the fact that their 'inner world' was qualitatively different from external physical objects (that is, it was something 'nonspatial' and nonphysical), they were still attributing the capacity to experience feeling to an inanimate object (a tree).

Dialogue 6. Eternal Life
The aims of the dialogue were to establish in what age and how children become aware of (1) the eternal need of a human individual to overcome the limits of his or her individual life, (2) the dialectical relationships between the change that a human individual undergoes throughout life and the feeling of personal identity that is preserved despite the change.

1. Tell me, who lives longer a human being or a butterfly?
2. What do you think, do all the living creatures die or there are some that live forever?
3. And what do people die from?
4. And what about you, would you like to live for a long time?
5. And if a wizard came to you and offered to make you immortal so that you would live forever and never die, would you agree or not? Why?
6. And what about other people would they agree to become˙ immortal? Would some of the people refuse?
7. If you agreed to become immortal whom would you like to be - a child as you are now, an adult person or an old person? Why?
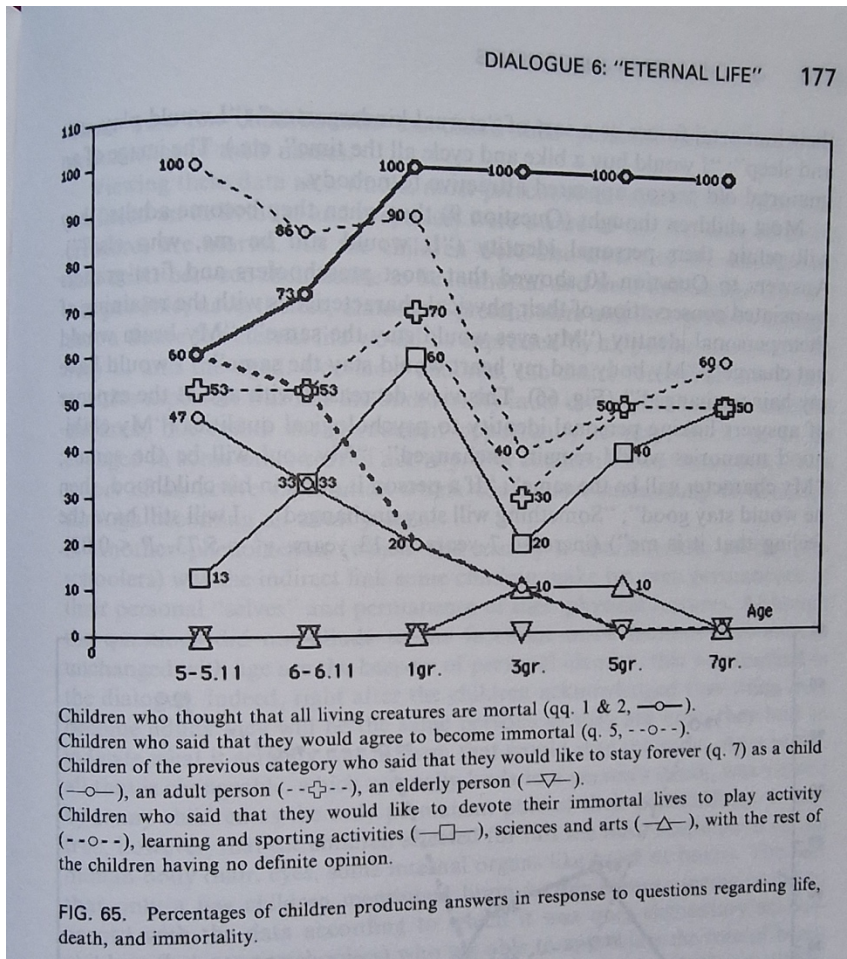
8. What would you do during this endless life?

9. And when you become an adult person, will this person be you or he/she will be a person different from you?

10. And what will change in you when you become an adult person? What will stay the same?

The dialogue revealed that most preschoolers and all schoolchildren were convinced that all alive creatures (including man) were mortal; those preschoolers who thought differently, either refused to name the creatures which they thought were immortal or named species ('a flower', 'a butterfly', 'grass') rather than individuals ('This is a butterfly. It always transforms into a chrysalis in the winter.'). The answers to question 3 (what people die from?) varied('from illnesses', 'from old age', 'from accidents', etc.).
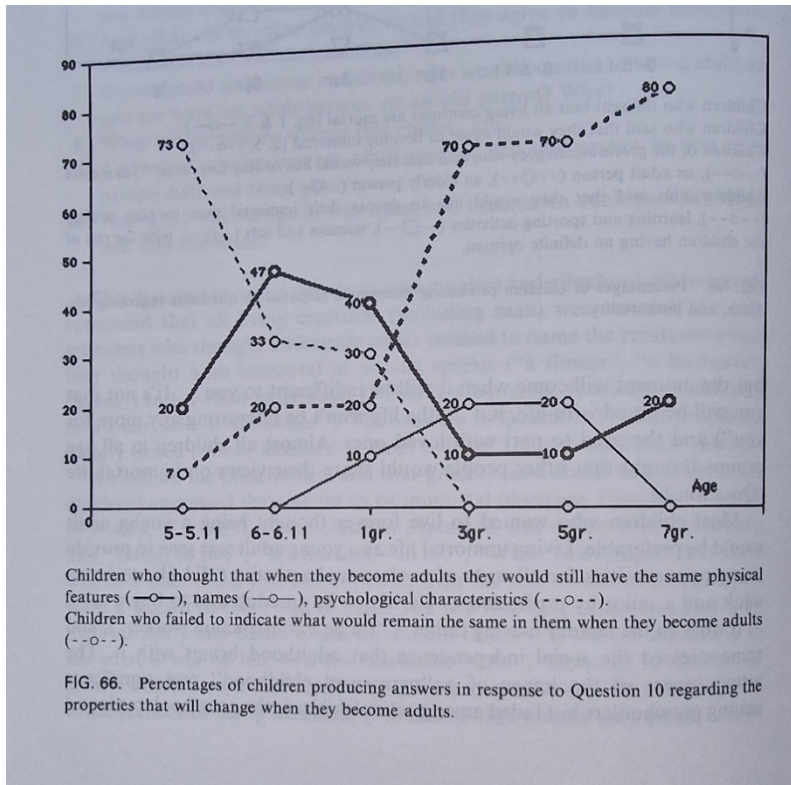
Almost all preschoolers and 1- graders (and about a half of older children) expressed their desire to be immortal (decrease, 7 years/1gr. to 9 years/3gr., $\chi 2=4.03$, $p<.05$). Some children grounded this desire by statements like 'I want to live' ,'It's horrible - to die', 'When you imagine that there will be the time when you will not exist then the awe comes to you and you want a wizard to come and to make you live forever', others justified it by their curiosity and desire to see the distant future ('It is interesting to see what it will be like in a few thousands of years.'). However, there was a number of children who didn't want to be immortal (Fig.65). Most of the children saw grounds for such a view in the negative consequences of being immortal ('It is now that I want very much to live, but the moment will come when it will be indifferent to you...It's not that you will be bored with life, but...the life won't be interesting any more for you.') and in the necessity to part with you loved ones. Almost all children in all age groups thought that other people would share their views on immortable life (Question 6).

Most children who wanted to live forever, named young adulthood as the preferable age for eternal life; usually they grounded the attractiveness of this age by the opportunities it gives one for all sorts of professional activities ('I'd like to be an adult and a sailor by profession.' 'I'd like to be an adult and to buy a car.' 'I'd work on the factory as my father.' 'I'd be a constructor worker.'), and some stressed social independence that the adulthood brings with it. The attractiveness of the image of a 'permanent childhood' was significant among preschoolers but faded among schoolchildren; the preschoolers used to view their immortal future as a sort of 'eternal kindergarten' ('I would play, eat and sleep.' 'I would buy a bike and cycle all the time.', etc.). The image of an immortal old person attracted

nobody.

Children who thought that all living creatures are mortal (qq. 1 & 2, —o—).
Children who said that they would agree to become immortal (q. 5, --o--).
Children of the previous category who said that they would like to stay forever (q. 7) as a child
(—o—), an adult person (--✛--), an elderly person (—▽—).
Children who said that they would like to devote their immortal lives to play activity
(--o--), learning and sporting activities (—□—), sciences and arts (—△—), with the rest of
the children having no definite opinion.

FIG. 65. Percentages of children producing answers in response to questions regarding life,
death, and immortality.

Most of the children thought (Question 9) that if they become
adults they would retain their personal identity ('It would still
be me, who else?'). Answers to question 10 showed that most
preschoolers and 1- graders associated conservation of their
physical characteristics with the retaining of their personal
identity ('My eyes would stay the same.' 'My brain would not
change.' 'My body and my heart would stay the same.' 'I would have
my hair unchanged.') (Fig.66). Popularity of this view decreases
in schoolchildren at the expense of a growing number of answers
linking personal identity to psychological qualities ('My
childhood memories would stay unchanged.' 'My soul will be the
same.' 'My character will be the same.' 'If a person is good in
his childhood, then he would stay good.' 'Something will stay
unchanged...I will still have the feeling that it is
me.')(increase, 7 years/1gr. to 13 years/7gr., $\chi2$ =5.73, p<.02).
There were a few children who associated their personal identity
with the permanence of their names.

Children who thought that when they become adults they would still have the same physical features (—o—), names (—o—), psychological characteristics (- -o- -).
Children who failed to indicate what would remain the same in them when they become adults (- -o- -).

FIG. 66. Percentages of children producing answers in response to Question 10 regarding the properties that will change when they become adults.

Viewing the data as a whole we can see that even most preschoolers (apart from those confusing an individual and a species) were aware of the fact that all living creatures were mortal. All the children were also aware of the discrepancy existing between their desire to be immortal and their knowledge that it was not possible; nevertheless, almost all preschoolers and 1- graders thought that the desire to have eternal life would be expressed by all people, except for very ill or old ones.). For most children the wish to have eternal life had a positive meaning it was not the immortability in its own right that attracted most children but rather a permanent opportunity to play, work or to be engaged in some other sort of activity. The children viewed the immortal life as a sort of an active exploration which could most successfully be achieved through becoming and adult person.

Another phenomenon (which mainly was a characteristic feature of preschoolers) was the indirect link some children made between permanence of their personal 'selves' and permanence of their physical features. Although the questions didn't suggest a direct allusion that the features that stay unchanged with age are the keepers of personal identity, this allusion was an implication of the dialogue. Indeed, right after the children acknowledged that when they become adults, they would be the same persons as they

were now, they had to indicate what actually was in them that would stay the same. As a result, all that changeable which normally eventually leads to the destruction and death of an individual was viewed by many children as the only permanent part of their personalities. It was true, however, that the children selected for this the most stable parts of a human body (hair, eyes, some internal organs like brain or heart). The fact that only a few children mentioned brain in this context seems to be in concordance with the data according to which it was only elementary schoolchildren (but not preschoolers) who are able to appreciate the role of brain as a primary locus of psychological attributes and identity (Johnson, 1990).

Among 3- to 7- graders (9- to 14- year- olds) there can be noticed some changes in children's judgements about human existence. Firstly, as children grow older, they start to appreciate some negative consequences that eternal life would bring about. Hence, the growing number of children refuse to accept the offer to be immortal the refusal which, of course, should not be taken for its face value: it is fairly possible that the children who have already lost their initial naivete of judgements were simply trying to devaluate their secret desire for eternal life.

Secondly, with age the children start to associate conservation of their personal identity in time not with constancy of their physical features, but with permanence of their psychological characteristics: with the mind, character, etc. These answers seem to be at odds with those reported by Johnson (1990) who found elementary schoolchildren to have a firm understanding of the brain as a bearer of psychological personal identity. The contradiction can be explained, however, by the differences in questions wordings applied in Johnson's experiment and in this study: whereas Johnson directly asked children about the role of the brain in personal identity (questions of what would happen if the child's brain is transplanted in an animal or another person), in this study questions were formulated in a free choice manner (what will change in you when you become an adult person?) what encouraged children to look for characteristics they thought to be linked with their personal identity.

Dialogue 7. Reality
The aims of the dialogue were to examine whether the children were able to realize (1) the limits that everyday reality puts upon thinking and activity of the individual (the impossibility of the immediate accomplishment of human wishes and the inaccessibility of another person's thoughts for direct observation), and (2) the positive role that these limitations

play in making human existence possible.

1. Tell me, if you wished very strongly that the microphone in my hand should turn into a sparrow, would it turn into a sparrow or it would not? Why?

2. And if you wished that a vase with sweets should appear in front of you, would it appear or not? Why?

3. And if you wished to know everything that I am now thinking without actually asking me any questions, could you learn it or not? Why?

4. And what about me: can I learn everything that you are now thinking or I cannot? And in what way can a person learn about what another person is thinking?

- - - -

5. Tell me, if you had a magic wand that could make all your wishes possible, what would you ask it to do for you?

6. Would you like to live in the world in which every your wish would immediately become reality? Why?·

7. Would you like to live in the world in which all wishes of all people in the world would immediately become reality? Why?

8. Would you like to live in the world in which all your dreams would immediately turn into reality? Why?

9. (if the answers are positive) Tell me, do you have only good wishes and no bad wishes or you may have bad ones too?

10. Tell me, are there only good people in the world or there are also bad ones?

11. So, would you like to live in the world in which all your wishes or those of other people would immediately turn into reality?

12. And what about the world in which people would be able to see each other's thoughts directly without even asking each other: would you like to live in such a world? Why?

13. Do you have sometimes thoughts that you would not like to share with other people?

14. And what about other people do they have sometimes thoughts that they would not like to tell anyone?

15. So, would you like to live in the world in which people would be able to see each other's thoughts?

16. Do you always have nice dreams, or you have frightening dreams as well?

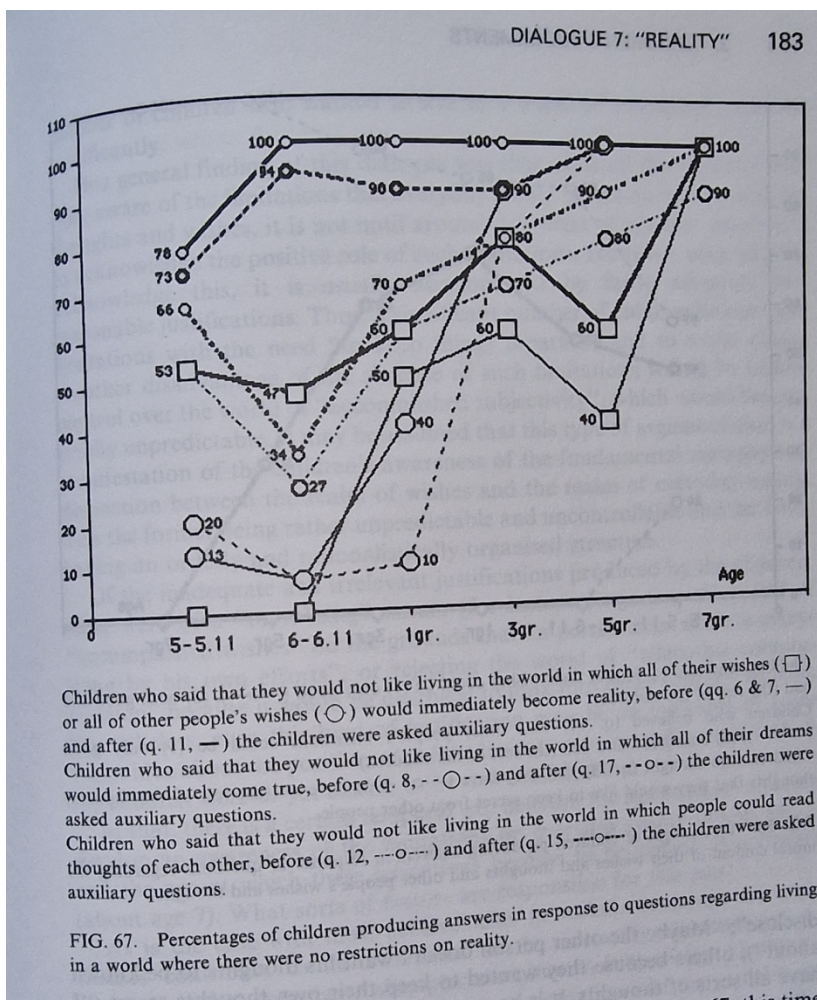17. So, would you like to live in the world in which all you dreams would immediately turn into reality?

Children's answers to questions 1 and 2 showed that they were fully aware of the borderline existing between their wishes and· everyday reality. The children denied the possibility for their

wishes to immediately become reality: they either simply acknowledged that it was impossible ('No, it is impossible for an inanimate object to turn into an animate one...') or pointed out that it was only possible in unusual realities like fairy tales or imagination ('No, it only can happen in your imagination, otherwise, it cannot.' 'No, I am not a wizard.'). Some of the children stressed the spatiotemporal gap that exists between individual objects ('No, it can't happen, because the microphone is a one thing, and a sparrow eats small beetles, and a microphone - it has not a stomach, no memory.').

A similar picture was revealed in children's answers to questions 3 and 4: most children thought that direct access to other people's thoughts was impossible. Some of the children simply denied such a possibility, others called this magic and telepathy which are impossible in real life ('No, people have no telepathic capacities.' 'No, we are not wizards.'), still others stressed the separate and enclosed character of the individual's mind ('No, I cannot do this, nobody can, because your life is one thing, and my life is another thing.' 'No, you are you and me is me, I can't get into your brains.'). The only way to learn about other person's thoughts the children saw in asking the person or guessing about the person's thoughts on the basis of his or her behaviour. Those few children who acknowledged the possibility of telepathy viewed it as a manifestation of human extraordinary capacities ('This can happen, yes...but not everyone can do it, you have to practice a lot to be able to do this.' 'You can learn˙ about other person's thoughts. Not nowadays, no, but they could do it in Egypt.').

Almost all preschoolers and a considerable number of schoolchildren didn't mind living in the world in which all their wishes would immediately turn into reality. They motivated this by their desire to achieve some practical goals ('Well, if you want to be asked a question by a teacher about something that you know well, you just think of it and the teacher would ask you.' 'I would like to live in such a world, because here you have to work hard in order to pass your tests, and in that world you can just wish this, and everything would appear ready for you in your notebook.'). However, many schoolchildren refused to live in the world like this (increase, 6 years to 9 years/3gr., $\chi2=14.87$, p<.001). One of the major reasons brought about by the children was their fear that their negative wished would slip away into reality ('No, I wouldn't like to live in such a world, because for instance I can think and tell something bad, and it would appear.' 'No, because if I want something, I would be unable to stop the wish and this wish could be a bad, wrong wish.' 'No, because sometimes I think something about what I later regret.'), others

were anxious about the overcrowded and bizarre nature of such a world ('No, because I think a lot of things, and if everything would turn real there would be too tough in the world.' 'No, because then I would have too many toys, there would be no room to place them to.'), still others motivated their refusal by their intention to achieve everything by their personal efforts ('No, because I'd like to do everything myself.' 'A person must achieve everything by his own efforts.' 'There would be no pleasure in such a world, it's fun to do everything on your own.'). After an auxiliary question (q.9) was asked, the number of children who refused to live in such a world in response to question 11 significantly increased (Fig. 67).

DIALOGUE 7: "REALITY"   183

Children who said that they would not like living in the world in which all of their wishes (□) or all of other people's wishes (○) would immediately become reality, before (qq. 6 & 7, —) and after (q. 11, —) the children were asked auxiliary questions.
Children who said that they would not like living in the world in which all of their dreams would immediately come true, before (q. 8, - -○- -) and after (q. 17, - -o- -) the children were asked auxiliary questions.
Children who said that they would not like living in the world in which people could read thoughts of each other, before (q. 12, ---o---) and after (q. 15, ---o---) the children were asked auxiliary questions.

FIG. 67.   Percentages of children producing answers in response to questions regarding living in a world where there were no restrictions on reality.

Most preschoolers and 1st graders thought that they would like to live in the world in which all their dreams would immediately turn into reality; most of the children were attracted by the unusual and fairy tale nature of the world like this ('I'd wish to, because if I had some fairy tale in my dream and if I liked it -

it would become real.' 'Yes, I'd like to live in such a world, because if I have a dream about a theatre, and a kingdom I'd like to have this.'). However, the overwhelming majority of schoolchildren refused to live in such a world (increase, 7 years/1gr. to 9 years/3gr., $\chi2=8.05$, $p<.01$). One of the major reasons brought by the children was that there could be also bad dreams ('No, I wouldn't like to, because for instance you see killers in your dream, and they would really start going around and killing people.' 'No, because sometimes you have bad dreams.' 'No, because your dreams do not depend on your control, and you can see something frightening and sinister in your dream.'); another reason was the chaotic and disorganized character of such a world ('No, because in that world...everything would be flying around in the air, the chairs and everything.'). As in the˙ previous case, a number of children refusing to live in the world of accomplished dreams significantly increased after the auxiliary question was asked (Fig.64).

The children's answers to questions about the world in which wishes of other people would accomplish (Questions 7 and 11) almost precisely reproduced those given in response to question 6. Number of children who refused to live in this world increased with age (6 years to 9 years/3gr., $\chi2 =6.53$, $p<.02$); as in the previous case, major arguments against living in such a world were the existence of bad wishes and the chaos that would reign in such a world. However, as it can be seen from Fig.38, this time the auxiliary question (q.10) produced a significantly stronger deterrent effect than it was the case with the world of accomplished personal wishes; it can be accounted for by the fact that children more often acknowledged the appearance of bad wishes in other people than in themselves (see Fig.68), with the difference between positive answers to questions 9 and 10 being significant ($z= 5.3$, $p<.05$).

About half of preschoolers and all schoolchildren refused to live in the world in which people could see each other's thoughts; some did it because of moral reasons ('Well, it would be a sort of peeping through a keyhole in the door.' 'Well, every person has˙ some thoughts which he or she wouldn't like to disclose.' 'May be, the other person doesn't want his thoughts to be known about.'), others because they wanted to keep their own thoughts secret ('I have all sorts of thoughts, it is no good if everybody knows about them.'), still others because they feared that they would not be able to maintain a stable route of their thinking ('No, because, for instance, you are walking and thinking of something, and when you are passing another person you'll have his thoughts in your head and your own thoughts would vanish.').

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Children who said (q. 9) that their wishes could be (1) only good (—o—), (2) both good and bad (the rest of the children).
Children who believed (q. 10) that other people's intentions could be (1) only good (- -o- -), (2) both good and bad (the rest of the children).
Children who thought (q. 13) that they have (- -o- -) or have no (the rest of the children) thoughts that they would like to keep secret from other people.

FIG. 68. Percentages of children producing answers in response to questions regarding the moral content of their wishes and thoughts and other people's wishes and thoughts.

The children who were willing to live in the world of 'transparent minds' justified this either by their interest to see what other people think or by their hope to benefit from such 'mental contact' ('I'd like to, because if nothing comes to my mind and other people have plenty of thoughts, then I would learn about those thoughts and follow them.'); there were also children who were attracted by the easiness of communication in such a world. After the auxiliary questions (q.13 and 14) a number of children who wanted to live in the world of telepathy significantly decreased.

A most general finding of this dialogue was that while all the children were fully aware of the limitations that the everyday reality puts on human actions, thoughts and wishes, it is not until the school age (around 7 to 9 years of age) that children start to acknowledge a positive role of such limitations.

However, once the acknowledgement comes about it is usually accompanied with fairly adequate and reasonable justifications. Thus, a significant number of children directly linked the˙

limitations with the necessity 'to keep things separated' and to avoid chaos. Another disadvantage of the absence of such limitations the children would see in the loss of the control over the world of 'accomplished subjectivity' which would become totally unpredictable. It can be assumed that this type of argumentation is a manifestation of the children's awareness of the fundamental metaphysical distinction between the realm of wishes and the realm of everyday reality, with the former being rather unpredictable and uncontrollable and the latter having orderly and rationalistally organized structure.

Among the inadequate and irrelevant justifications produced by children most had a 'moralizing' character (for instance, rejecting the world of the 'accomplished wishes' on the ground that 'a person must achieve everything by his own efforts' or rejecting the world of 'telepathic communication' because it would be unethical to look into other people's secrets). Nevertheless, even this kind of justification can be an indicator of some vague idea about a positive role of the everyday reality restrictions which children were yet unable to put in more clear terms.

In sum, there is a certain temporal gap between the age in which the children develop awareness of the everyday reality limitations and the age in which these limitations become to be viewed as necessary; if the former appears in most 5-year-oldsthe latter can only be traced in 7-year-oldsand older children. What kind of factors could possibly determine this gap?

As it is the case with most achievements of verbal reasoning, there are two major factors that could contribute to the awareness˙ of the necessary character of the restrictions that everyday reality puts on human subjectivity. One is the development of the cognitive means of awareness and the verbal capacity to express those mental states that the child can observe in his or her own mind, and another is the enrichment of the child's mental experience. Indeed, as the child's experience of social interactions grows, the child is increasingly confronted with situations in which he or she has to restrain his or her impulses; consequently, the child begins to view some of his or her wishes as something alien to his or her 'I' something that, although it is a part of the child's mind, is undesirable and has to be restrained. To a certain extent this experience can be enhanced through listening and reading books and stories in which the necessity of self- restriction is stressed (like it is, for instance, in a story by a Russian author Valentin Kataev 'Tzvetik -semitzvetik.'). On the other hand, the child learns various cultural symbolic means which are invented in order to indicate and express the areas to which those restrictions are applied (like the demand 'to achieve your goals on your own,' 'not to give

you negative moods and intentions away', 'to respect other
people's privacy', etc.) It is only when the child's experience
and the cognitive means come together that the genuine positive
role of the restrictions that the everyday reality imposes on our
wishes becomes obvious for the child; the data of this dialogue
indicate that this doesn't obviously happen until the child
reaches the age of 7 or 9.

Concluding remarks: Children's reasonings about metaphysics of a human being

Looking at the overall results of the study it can be seen
that the children of the age range employed revealed very diverse
and sometimes very profound judgements about various aspects of
human reality some of which are very close to the models accepted
in rationalistally oriented social sciences and others strongly
deviate from them.

Thus, on the one hand, children of all ages rightly ascribed
capacities of perception and differentiation between senses of
various modalities to the newborn infant as far as the capacity to
assess the relative distance to various objects (what corresponds
to the data of contemporary infancy studies, see Bower, 1972;
Bremner, 1994). Similarly, most children considered themselves to
be the authors of their voluntary actions, acknowledged that they
were responsible for the accomplishment of their immoral wishes
and were able to realize some mechanisms of the unconscious (such
as the influence of needs on human dreams and human perception,
the possibility for unconscious wishes to be transformed by human
consciousness in order to fit the logic of real life). Many of the
children were able to describe accurately the criteria that
distinguish everyday reality from unusual realities.

On the other hand, a typical feature for most Russian and
British children was the tendency to attribute psychological
capacities to the newborn infant which, even according to the most
optimistic scientific views, appear much later in the child's
life, such as the child's capacity to view its sensations as
personal, to identify its body shape with the bodies of other
people. All Russian and British children considered verbal
knowledge of moral norms to be a sufficient condition for the real
upholding of the norms. Most of our subjects viewed themselves as
personally responsible not only for their practical actions but
for their desires and motivations too, they also viewed a human
person as a limited creature with a relatively short list of
wishes and needs. Most children ascribed to plants needs and
experiences pertinent to human beings only.

As it was the case in the study of metaphysical judgements

about the world, the replication study in Britain showed that with regard to the judgements about human psychology British children manifested similar phenomena to those shown by Russian children. They attributed precocious capacities to a prelinguistic newborn infant, they thought that knowledge of moral norms was enough to enable the child to implement those norms.

However, generally British children proved to be more cautious than Russian children in attributing these precocious capacities (such as inherent knowledge about the objects that initiate sensations, or the skills necessary for being able to use those objects in accordance with their social functions) to the infant. This can be assumed to be the effect of the relatively early beginning of school education in Britain if compared to Russia, as well as the consequences of certain differences in cultural material about children development available in the two cultures.

Yet, if it is school education that produces the acceleration˙ of the 'psychological mindedness' in British children, then the question is still open about what is specific in British schooling that can produce this more skeptical view about the capacities that a prelinguistic infant could have or about the limited character of possibilities that the acquisition of language brings about.

Most noticeable changes in children's judgements occur at the primary school age (1st and 3rd graders). It is just at that age that most of the subjects begin to deny the newborn's inherent knowledge about the objects' names (they do, however, attribute the knowledge to the child who was taught language), they stop identifying knowledge about objects names with the knowledge about objects' functions and with the capacity to handle the objects appropriately. At this age children already didn't ascribe to a newborn infant the inherent knowledge about other people's existence as well as the capacities to understand human speech and implement moral norms. It is just at this age that most children were able to acknowledge the 'perceptual defense' mechanisms, to realize that nonliving objects have not the 'inner world' which was attributed exclusively to animated creatures. The children of this age also revealed understanding that stability and identity of the personal 'I' of the subject throughout time is guaranteed by the stability of psychological qualities (and not, for instance, by the permanence of the subject's appearance or other physical qualities); another important acquisition of this age was the realization of the necessary character of limitations that distinguish everyday reality from unusual realities like dreams or˙ imagination.

Somewhat later (at the age of 11 13 years) most children

revealed an understanding of other ideas about a human being pertinent to rationalism, such as the idea that immoral impulses and wishes can appear spontaneously in a subject who is not, therefore, responsible for having them unless he or she implements them in his or her real behaviour. Children of this age no longer attribute moral feeling to animals, and many of them reveal their negative attitude towards the immortal life basing it on the realization of the negative aspects that such an existence would bring with it for both the individual and society.

Thus, it becomes obvious from the findings that children's judgements about human reality within the studied age range undergo significant changes. These changes are of two types. Firstly, they include extension of the actual knowledge and information about the structure and genesis of human reality (for instance about the role of sensations, of speech, of the causes of violation of moral norms, etc.). Secondly, children's general capacity to understand the complex nature of human reality develops too what creates in the children a special zone of potential knowledge. The latter was especially obvious in the children's increasing capacity to catch 'hints' given by the experimenter's questions and to realize certain ideas in the very process of conversation.

As it is the case with respect to children's judgements about metaphysical problems of the external reality, the development of children's judgements about metaphysical aspects of human reality mainly is not the result of the deliberate learning and teaching; rather, it comes from the spontaneous work of children's minds based on the independent reading, TV and movie watching, everyday conversations and observations over one's own experience and over other people's behaviour. Children's judgements about human reality are also tightly linked to their ideas about metaphysical structure of the external world: it is just the authentic experience of the reality of their own minds that can give the children the idea to make distinctions between psychological images and physical objects, between the relative freedom of the personal action and the rigor causality of physical events, between chaotic structure of events in dreams and orderly sequence of the event of everyday life, etc.

THE DEVELOPMENT OF METAPHYSICAL KNOWLEDGE IN CHILDREN: A GENERAL VIEW

A distinguished feature of human mind is its everlasting need to explain the world, to reduce complex and unclear knowledge to a few simple and clear notions, to elucidate the world's

enigmas through concepts already available and at our disposal.

Philosophers of antiquity were the first who made an attempt to represent the world's diversity through a combination of the four elements ground, water, air and fire or through a composition of small uniform balls named "atoms." In contemporary physics theories of the structure of matter became more complex but their task basically remained the same: they are created in order to explain what "protoelements" underlie the diverse world of elementary particles and whether we can view all the known physical phenomena as variations of a limited number of "laws of nature." In other sciences both natural and social - the attempts to explain the increasing number of new phenomena grow with no lesser intensity than in physics.

But the external world the world of nature and society - doesn't embrace everything that is to be explained. There is another world -- the world of mental psychological phenomena, the world of human thoughts, fantasies and dreams. This world is full with enigmatic and mysterious phenomena. They are even more difficult to explain than are natural phenomena. Indeed, natural phenomena are something that exists for everybody and can be cognized by joint efforts of people. In contrast, subjective phenomena are hidden in the inner world of an individual. They are displayed on the "screen" that only the individual can observe and that is inaccessible for other persons' looks. It is not always that a person can evoke psychological phenomena purposefully. It happens sometimes that the person's thought, image of feelings slip away from him or her, and suddenly they can reappear in the most unexpected moment and in the most bizarre combination. Understanding of the "laws" of this world is not an easy task. And the "laws" themselves are very unlike the laws of nature.

So, there are two worlds external and internal ones. And there is a 'third world' the world of ideas (like the idea of necessarily true knowledge, the idea of 'cogito') which are neither clearly external (like are physical objects) , no absolutely internal (like are dreams), but, being mental entities, yet exist independently of our minds (see Popper, 1975). These worlds are tiny illuminated spots in the infinite depth of unknown. But on a scale of a separate individual human life the "zone" of already cognized appears to be very large. The zone embraces knowledge and culture. This zone is what newborn children have yet to go through. From the first days of children's life adults introduce them to this zone. The children can hear sounds of human speech, see the contours of things that surround them, touch surrounding objects and human artifacts with their arms. In other words, from their first days the children

fall in a special "canal of education" through which human experience is transmitted to them.

At the beginning this canal in narrow and shallow. It embraces only what adults can teach the children without assistance of words. Gradually the canal gets wider. Normally this is in a kindergarten or in a primary school where children find themselves trapped in the canal of systematic education. The latter reaches its culmination in a secondary school and institutions of higher education. Systematic teaching is a major route through which our children acquire the achievements of culture and the mastery of understanding and explaining the world. Usually, this route is in the direction 'from elementary to complex' and 'from particular to general'. At first children acquire a mastery of writing letters and then a mastery of writing words and sentences. At first, they have to acquire arithmetic and only after this they can pass to algebra. This way - step after step adults drive children along the "educational canal" until the children become adults themselves and reach the borderline beyond which the scope of cognized world comes to its end and where they have to find their way further ahead without help and assistance.

But there is yet another way of cognition and explanation of the world. This way is the opposite to the first one. This way is 'from complex to elementary knowledge' and 'from fundamental to particular'. The problem is that the world is impatient. It cannot wait until children guided by adults in their way along the 'educational canal' will gradually cognize it. Instead, from the children's first days the world crashes upon their minds with all its diversity and complexity that overwhelmingly exceeds the children's capacity of explanation. Being bombarded by the˙ abundance of complex phenomena to which they are yet unable to find any 'scientific' interpretations the children, nevertheless, have somehow to organize and explain these phenomena. They have to explain them on the basis of that small portion of knowledge and experience that they have yet accumulated.

Of course, not all natural and psychological phenomena become the objects for the children's curiosity, and many of them the children simply ignore. Still, the number of such 'unexplainable' phenomena substantially exceed the number of events the children are being taught to explain in an "accurate" scientific way. While trying to overcome this flood of new problems children address themselves to adults. Perhaps, this is exactly what causes the innumerable children's "why's." But and not because of the adults' fault many of the "why's" are doomed to be left without answers. Indeed, in order to explain to a 4-year-old child "why the wind blows" or "why the grass is green" one has to lean upon

knowledge that the child still lacks. And then the children have to find answers on their own. Of course, these answers are very unlike adults' interpretations and the time will come and children will find these answers funny. But now the children need them. They need them badly in order to bring a certain harmony in their chaotic experience and reduce, even but slightly, their "strain of nonunderstanding."

Traditionally, this line of growth of spontaneous knowledge was reduced to the scope of physics. Although Piaget in his early works touched upon some metaphysical issues in his interviews with children(like that of the origins of dreams), they turned to be˙ sporadic experiences and did not find a proper continuation in Piaget's later works. The growth of child's spontaneous knowledge, as well as the development of the purposefully taught capacities, have been viewed as a progressive 'building up' of a 'tower of knowledge', with elementary skills (like manipulations with sensorimotor objects) going first, and broader generalizations (like the concept of conservation) following them in due course.

The progressive course of cognitive development which is usually linked to the development of psychological functions (thinking, perception, memory) does not, however, exhaust the whole of the development of mind. As has been assumed in the studies presented in this manuscript, any cognitive development has yet to have a starting point, a foundation which could 'make sense' of the child's experiences and help the child to organize the experiences in a set of sensible patterns. It has been argued in this book that metaphysical intuitions are just what this foundation consists of. It is only on the basis of the fundamental metaphysical distinctions (like the one between mental and physical, sensory images and real objects, true and false knowledge, dreams and reality, free and 'caused' actions, etc.) that the notions of experience and experimental (empirical) proof become possible.

And where does this foundation come from? Is it already here when the child is born as a sort of the universal 'anthropological precondition' of development or it depends on the child's age and is culturally conditioned? This questions is very rarely asked. One of the possible reasons for this lack of interest to˙ metaphysical foundation of cognitive development is the fact that this foundation is beyond the traditional experimental approach, hence, it is difficult (though not impossible) to study by the usual experimental methodologies. On the one hand, as it has been argued in the Introduction, interviews that allow for the application of sophisticated statistical means have to reduce answers to metaphysical problems to 'yes' or 'no' type what misses the very point of metaphysics the process of metaphysical

thinking. On the other hand, behavioral methods, which are usually highly effective in experiments on cognitive and personality development, are equally unsuitable here, as, in contrast to social or moral concepts, metaphysical intuitions are of so general nature that they cannot have unequivocal behavioral indices.

Another reason is the common view that metaphysical foundation of development, studied or not, cannot change our knowledge about the development of any particular mental function and is always here, as the air that we inhale; therefore, it can not possibly be of interest for applied oriented educational studies. As a result, I was unable to find a systematic psychological study of the development of children's metaphysical proficiency, and those studies that existed were of sporadic nature and had to be extracted from the contexts in which they have been originally framed.

Yet, it is assumed in this study that the development of metaphysical knowledge in children can be approached by psychological means and that knowledge about this development can˙ be of theoretical, as well as practical, importance.

With regard to the theoretical significance, knowledge about metaphysical foundations of cognitive development can shed new light on this development. Consider, for instance, the development of object permanence beliefs in children. Investigated outside its metaphysical context, the development of object permanence is usually viewed as an isolated series of transformations of the initial nonpermanent 'tableaux' (Piaget, 1983) or certain inborn intuitions about the external world (Bower, 1979; Bremner, 1994) into increasingly stable and permanent objects. However, this kind of understanding confronts us with certain unintelligible paradoxes, as the one how the idea of permanence can possibly appear in the world ruled by sheer nonpermanence. The paradox is the one of 'creation something from nothing' and has no a plausible solution, unless it is assumed that object permanence concept is transmitted genetically.

In a sense, this controversy can be viewed as an example of what has recently been discussed as the 'learning paradox', that is the impossibility to logically conceive a constructivist view on learning, as any cognitive structure learned requires as a prerequisite an equally complex cognitive structure to be already present in the learner (Fodor, 1980; Pascual- Leone, 1980). With regard to the acquisition of knowledge there are several possible solutions of this paradox on offer, most of the highly debatable (see Bereiter, 1985; Leslie, 1993).

However, as far as the acquisition of the fundamental distinctions of the world (to which metaphysical distinctions˙

undoubtedly belong) are concerned, a special solution of this paradox can be offered. As these distinctions have binary structure (like permanence versus nonpermanence, physical versus mental, causally determined versus free- determined events, necessary true knowledge versus empirically true knowledge), the learning paradox can be dismissed if the change in a traditional paradigm (model) of development is accepted, namely, if the 'replacement' model is substituted by the 'coexistence' model of development (see about this Subbotsky, 1993,a).

Indeed, taken in its metaphysical framework, the development of object permanence can be presented as reflecting one aspect of a more complex process, which is the growing awareness of the distinction between mental and physical worlds, with the former being a site for predominantly nonpermanent entities and the latter consisting mainly of permanent objects. In this view nonpermanence is not replaced by permanence in the child's developing theories of the world, rather they both coexist in the child's mind from the outset having their roots in the metaphysical structure of the universe and not in the peculiarities of the 'geometry of genes'.

In terms of educational practice and applications, knowledge about the awareness that children of various ages have of metaphysical concepts can help in creating educational programs and strategies that could facilitate various aspects of cognitive development. Thus, a series of analytical studies undertaken in this manuscript (see Part 1, dialogues 6 and 7) can be viewed as models for this kind educational programs developed to˙ facilitate children's and adults' understanding of some fundamental structures of rationality (i.e., the division between psychological and physical means of object representation, and the realization that a certain almighty creative force has to be acknowledged as acting in the world). More specifically, certain dialogues developed for testing children's awareness about metaphysical aspects of a human subject can be directly converted for purposes of psychological education which in this case would take shape of some kind of 'shared activity' in which a child is 'helped' to discover certain truths about human perception , moral behaviour, dreams, etc., rather than is 'taught psychology' in a traditional directive manner,

We are leaving 'out of brackets' here the discussion on whether consciousness of a structure lags behind the construction and control of the structure, or this is not the case (Piaget, 1954; Brown et al., 1983). It was sufficient for the present study to assume that in both cases metaphysical intuitions, due to their most general nature, could only find adequate manifestation through subjects' reasoning (and through complex reasoning-justifications at that) and could not be studied through subjects' behaviors, which can directly express the individual's motives and intentions (Subbotsky, 1993) but are highly

indefinite with regard to the individual's metaphysical intuitions.
The data of how children of various
ages reason about freedom of action, the relationships between
actions and desires, responsibility for one's deliberate actions,
morality and similar metaphysical problems can be of help to those
who are interested in child's testimony and other legal problems
involving children. Lastly, the empirical data collected about the
age related development of metaphysical judgements in children can
be a source of reference for specialists in philosophy, sociology,
theology, logical education, for authors writing for children and,
in fact, for everybody who is not indifferent to the cognitive·
development of children.

With regard to methodological aspect, it has to be stressed
one again that studies of metaphysical concepts in children has to
heavily rely on children's verbal judgements. This is because the
child's real behaviour (which was in the center of studies
reported in the author's two previous books, see Subbotsky, 1992,
1993) can tell us about the child's feelings and motivations, but
it is the child's awareness of what he or she is already a holder
which is a target in the studies of metaphysical knowledge.,
Of course, speculations of educational applications here can only be preliminary, as
the translation of psychological methodologies into classroom application programs is a
special and complicated procedure (see DeVries, 1987; Adey & Shayer, 1994). Having
spent more than a decade on this kind of attempts (Subbotsky, 1993,b), I am fully aware
of the impossibility of the 'direct translation' of laboratory psychological experiments into
long- term educational programs. Yet, it seems to me that verbal dialogues with children
stand closer to the educational mode than, for instance, a traditional psychological
testing, as they involve a kind of 'shared activity' between the tester and the subject which
is an important condition for any educational intervention (Vygotsky, 1982).

No wonder, therefore, that the effectiveness of dialogues presented
in this manuscript would depend on the child's linguistic
proficiency. However, the fact that some children could have poor
linguistic capacities does not necessarily mean that their
metaphysical knowledge is equally poor or absent altogether. To
take an adequate image, a description of the air chemical
compounds can only be done with the advanced means of chemical
analysis which does imply that before those means were developed
the compounds were not in the air. This also suggests that what
we call the development of metaphysical knowledge in the child is
rather the 'growth of awareness' than the 'growth of complexity'.
This 'growth of awareness' can, however, be quite complex and·
dependent on various factors (like already mentioned linguistic
proficiency, cultural background, age, etc.). The basic objective
of the studies presented in this manuscript was to obtain a
general picture of this 'growth of metaphysical awareness' and the
role the factors mentioned play in it.

More specifically, the aim of the two studies reported in this book was to get a most general picture of how children aged 4 to 14 years would judge about some fundamental metaphysical problems. In so far as a number of these problems is fairly large and the possible solutions vary widely, the major difficulty in undertaking such a study was that of the selection. With regard to metaphysical problems dealing with the world as a whole this selection was based on the group of problems discussed by Rene Descartes, whose works also served as a scale for the evaluation of children's judgements. With respect to metaphysical problems which concern an individual human being the original selection employed a wider range of authors (such as Condillac, Goethe, Vygotsky and others) who contributed to the way a human being is viewed and treated in contemporary rationalist European (Western) tradition.

To provide a cross- cultural validity of the study its major dialogues were replicated in Britain. As the results showed a strong similarity in the development of metaphysical thinking in Russian and British children, the results will be discussed here as related to both cultural groups.

The findings of the first part of the study showed that (1) at the age of 5 to 9 years children were able to realize most of the fundamental metaphysical problems and they were capable of finding solutions for them close to those given by Descartes; (2) some of the Cartesian solutions were given by a significant number of younger subjects (4-5 years of age) with only a few older subjects (school age) producing them; (3) some of the solutions stayed inaccessible for the subjects over the whole age range.

As for the *first group of Cartesian solutions*, it included the understanding of the identity between 'existence' and 'thinking' and the close link between 'truth' and 'existence.' At the age of 7- 8 years a typical definition of true statement (or true knowledge) was given through linking it to existence: ' Truth is something that really exists in the world', 'If somebody tells something and it really exists this is the truth, and if somebody tells something and it doesn't exist it is false.'

The idea of the 'object- subject' indivisible unity too was quite obvious for most 5- 6-year-olds: 'If I exist the world must exist either', 'If I can see the pen then the pen must exist really and truly, it is not just what seems to me.' One more solution which was close to the one suggested by Descartes was the distinction between dreams and reality. Most children as young as 6 described dreams as a special reality in which logical and causal connections between things were 'melted' and there were no contiguity in the stream of thinking or acting.

Lastly, the most important structure acquired by children

within this age span is the distinction between body and mind, physical and mental phenomena. At the beginning (in 5 and 6 year old children) body and mind are not yet separated one from· another; most of the physical properties such as weight, spatial location, accessibility to senses, divisibility, etc., are attributed by the children both to their bodies and to their psychological entities (to their 'I' and 'thoughts'). By the age 7 psychic entities lose their physical qualities and become completely autonomous of the body, so that, according to the children, even illness is unable to impair them ('It is my body that hurts, my thoughts cannot hurt, they only can think about the pain').

The *second group of Cartesian solutions* was the most interesting one since , paradoxically, it was produced only by younger subjects. The data showed, for instance, that 20 to 30% of 5- 7-year-old children considered psychological entities (such as 'I' and 'thoughts') to be immortal. When asked what would happen to the 'I' and 'thoughts' of a person who died the children answered that they will not die because 'they are just letters', 'they are just words and they don't exist'. Instead, according to the children, the person's 'I' will 'turn into air', or 'will fly out and go into another's man head', etc. Obviously, this type of reasoning is very close to the one given by Descartes as well as to the broadly spread idea of the 'soul reincarnation.' However, the idea became unpopular among 9-year-olds and older children all but a few of whom were strongly convinced that the person's 'I' and 'thoughts' die at the same time as his or her body.

One more idea of the same kind was the Cartesian version of the proof of the almighty person's existence. About half of 5- year olds acknowledged that 'almighty wizard' existed in reality (they· allocated it's place of inhabitance as 'the other planet', 'the woods', 'the mountains'). However, most 6-year-olds and all schoolchildren emphatically denied such a possibility. Despite the fact that most of them acknowledged that they were able to have the 'almighty wizard' in their minds and that the imagined wizard was so almighty that even could come out of their heads and 'sit down here', the children denied the real possibility for such a creature 'to come out' and, therefore, to have real existence. More than that, in the discussion that followed the dialogue most children repeatedly acknowledged that the 'wizard' was almighty and able 'to do everything' only in order to deny this very 'almightiness' over and over again.

This resistance to the ontological argument was equally strong in Russian and British children and adult subjects. A special analytical study with adult subjects which aimed to determine the causes of this resistance showed that the denial was

made because of psychological, rather than logical reasons. A further inquiry in the nature of these reasons revealed that it was the subjects' strong belief in object permanence (i.e., in the fact that a mental image cannot spontaneously transform itself in a real physical object) that made nearly all subject reject the ontological argument. As soon as this belief was (if only situational) shattered a significant number of subjects became more lenient to the idea that real existence of an almighty subject must necessarily follow from a sheer idea of such a subject.

Lastly, the *third group of Cartesian solutions* was the one that stayed inaccessible (or was completely ignored) by most children across the whole age span. This was displayed very clearly when children were asked to allocate subjective qualities of objects (such as sense of 'redness', 'warmth' and 'pain' either in the subject's brain (sense organs) or in the external objects. Contrary to Descartes' view, almost all the children allocated warmth and 'redness' to the external objects rather than to the human perceptual apparatus; with respect to pain, however, the answers were in concordance with those by Descartes.

A more specific enquiry showed that this confusion between subjective and objective qualities of objects affected not only visual and temperature perceptions, but sensations of other modalities as well, and it was experienced by adult subjects to the same extent as by children. The analytical study in which various interventional methods were used revealed a strong and persistent character of this confusion and showed that it can only be partially overcome by means of creating a conflict between views of various people regarding the same objects.

Another Cartesian solution that most children were at odds with was the statement about the conventionality of objects' names. Until age 12 all the children claimed that names were immanent qualities of an object and could not be changed (what also was in concordance with the data earlier reported by Piaget). Only at age 13 some children agreed that objects' names were conventional.

The main result of this part of study was therefore that children as young as 6 produced solutions to many fundamental metaphysical problems similar to those given by Descartes. The question for discussion is how these solutions could possibly have penetrated the children's minds. As far as the metaphysical questions discussed are beyond the scope of school curriculum and routine verbal communication it is reasonable to guess that they are the result of spontaneous work of children's minds. Of course, it is unlikely that children invented the solutions independently, rather it would be more plausible to assume that they absorbed

them from the cultural material that is provided by their social environment.

Regarding the second cycle of metaphysical problems (problems that mainly dealt with human reality), the picture revealed in the study was rather complicated and multidimensional. At that, it was possible to distinguish certain contours in this picture which reflected basic changes that happen in children's social life and in their way of thinking as they grow older. Most clearly the margins between these contours can be seen if we compare the answers given by preschoolers with those by 3- graders, with the answers produced by 1- st grade children (7- year- olds) normally occupying an intermediate position between the other two.

Thus, most preschoolers revealed a certain 'anthropomorphism' in their judgements about human psychology: they tend to ascribe to a newborn child (and even to inanimate and nonliving objects) many characteristics that they possessed themselves. Paradoxically, with respect to certain of these capacities (such as an inherent capacity to depth perception) these anthropomorphic views approach some of the latest discoveries in infancy studies. The basic pattern of the children's answers, however, reveals their tendency to view human infants and even inanimate objects by analogy with themselves, which means that the parallels these views might have with the scientific discoveries are nothing but coincidental.

Those *dynamical factors* that underlie and promote psychological development of the child (such as the child's practical activity with objects and human artifacts, education, learning, communication and interaction with people, the child's changing position in a social group with certain responsibilities and privileges attached to it and with appropriate motivations that it produces) which are in permanent action and which eventually bring about changes in the *static components* of human psychology (which are normally described as sensations, perceptions, language abilities, moral behaviors, etc., and can be measured by psychological means) are yet concealed from the child's 'mental eye.' These dynamical factors don't figure in preschooler's explanations and justifications, and the end effects that these factors produce are viewed by the children as human inherent capacities.

Thus, in the children's views sensations (visual sensations in particular) 'usurp' the results of the practical activity and education (such as the holistic and 'object- related' nature of perceptions, the capacity of a human individual to distinguish between 'my' and 'alien' in his or her mind, the individual's capacity to relate his or her perceptions to his or her person, etc.); the children think that a newborn infant who has no

capacities but sensations can, nevertheless, be aware of the personal character of his or her sensations, can realize that there are other people around and they look like him or her, and even is able to understand human speech. The appreciation of the role of speech by this group of children is deformed in a rather strange way: on the one hand, the children cannot see any link between the development of the aforementioned capacities in the child and the development of language, and, on the other hand, they think that objects' names contain knowledge about objects' functions and even provide the infant with the skills of using the objects; they also think that the sheer knowledge of moral norms enables the person to conform to the norms. Speech and knowledge of objects names are not, therefore, viewed by the children as necessary conditions for being able to understand what objects are; however, the names, if acquired, are enough to bring about the capacity to know about objects' functions and even to act with the objects appropriately. Objects' names, as they are, accumulate and absorb for the children the effects of those factors which are yet concealed from their minds that is of education and practical activities with the objects and moral motivation.

       With respect to other problems involved, the children of this age too revealed certain common strategies. For instance, they were reluctant to acknowledge that some of their wishes are beyond their voluntary control (the illusion of being in a total control over their emotions and wishes) and thought that they were responsible for the emergence of immoral wishes in them (Dialogue 2); they believed that their wishes could be completely satisfied· in due course (Dialogue 3) and revealed relatively poor appreciation of the unconscious mechanisms such as apperception of perceptual defense (Dialogue 4); they expressed their wish to have immortal existence which many of them viewed as a sort of 'eternal play' (Dialogue 6); they also were unaware of the negative consequences of living in the world of 'accomplished wishes and dreams' (Dialogue 7).

       The views of most school age children substantially differed from those described above: basically, they stand much closer to what educated adults in European cultures would think is true. Firstly, the paradoxical combination of the underestimation of certain functions of language in human mind with the overestimation of its other functions which was a characteristic feature of most preschoolers' judgements, smooths away and eventually disappears. Secondly, most senior schoolchildren do not think any more than mere sensations contain knowledge about the names of the objects that produce them, and, on the other hand, they also stop thinking that sheer learning of the object's name brings with it either the knowledge about the object's social

functions or the skills which enable one to handle the object accordingly. The children become aware that the sheer knowledge of moral norms by a child does not necessarily mean that the child would conform to the norms in his or her real behaviour.

Certain age trends can be also seen within the school age. For instance, the views that older schoolchildren have on certain metaphysical aspects of human reality correspond to the models held by contemporary rationalist social sciences to a considerably larger extent than those by younger schoolchildren. Thus, most 5- and 7- graders understand that many human desires and wishes have a spontaneous character and that it is only the implementation of wishes that can be a subject to voluntary control and personal responsibility (Dialogue 2). They realize that human desires can hardly be completely satisfied in a natural way (Dialogue 3), they can better appreciate the role of certain unconscious mechanisms (such as the affect that individual's needs have on the individual's apperception, Dialogue 4), they attribute no longer psychological qualities to an inanimate object (Dialogue 5), they can better appreciate the negative consequences of the immortal existence (Dialogue 6) and the existence in the world of accomplished wishes and dreams (Dialogue 7).

Along with the differences in the views of younger and older children some curious similarities were revealed. For instance, the capacity to appreciate visually distances to the objects was attributed to a newborn infant by the overwhelming majority of children in all age groups; most of the children also attributed to a newborn prelinguistic infant the capacity to realize personal relatedness of its sensations (Dialogue 1, part 1) and appreciated the role of speech in realizing other people's existence (Dialogue 1, part 2). The approximately equal numbers of children of all ages (1) thought that they were the authors of their wishes (Dialogue 2), (2) believed that their wishes could be completely satisfied by a wizard (Dialogue 3), (3) were able to appreciate the affect that their needs might have on their dreams' content (Dialogue 4), (4) attributed psychological qualities to a plant (Dialogue 5), and refused to live in the world of the accomplished dreams after the auxiliary questions (Dialogue 7).

We can see therefore, that in children's judgements of human reality certain trends were observed that had been earlier reported to be present in children's judgements of physical and natural events (Piaget, 1983; 1930; 1962), namely: the transition from the anthropomorphic views (which comprised 'finalistic', 'moralistic' and 'artificialist' judgements) to the more 'physicalist' views, from the predominant reliance of children in their judgements about the infant's capacities on the static and phenomenally 'visible' parameters (such as immediate

perceptions of shapes and names of objects) to the better appreciation of the 'invisible' dynamic processes (the infant's practical activities with objects, interaction with other people, learning). The most prominent changes were observed to occur in children aged around 7 years. It can be assumed that these changes reflect certain universal mechanisms in the development of children's thinking which affect children's metaphysical judgements as well as their judgements about physical objects and events.

However, the effect of these universal changes can be traced only in one part of children's metaphysical judgements with the other part staying unaffected and independent from age. It is true that those judgements that experience the impact of these universal changes tend to approach the judgements that would be viewed as 'correct' by most adults in this culture. However, as it was mentioned before, viewing these changes as 'progressive' has˙ to be treated with caution. For instance, the view according to which the newborn infant can appreciate spatial distances shared by many children independently of their ages was likely to have been accepted as totally wrong by many psychologists at the beginning of this century [see, for instance, Piaget's account on the sensory- motor based acquisition of space perception in infants (Piaget, 1936), or Vygotsky's arguments against the possibility of the 'orthoscopic' perception in infants (Vygotsky, 1987)], however, results of many recent studies seem to be in favor of this view (Bremner, 1994). Although this consonance between children's naive psychology and recent scientific findings is, no doubt, coincidental, it is not impossible that similar coincidences will be found with regard to some others 'childish' interpretations of human reality revealed in this study.

Another problem with respect to children's views on human reality is the problem of the determinants. Clearly, some of the judgements look as being the result of children's spontaneous thinking, both because of the absence of any special psychological education in contemporary kindergartens and schools and because of the lack of knowledge and interest that most parents suffer when it goes about 'talking of human psychology' with their children. Consequently, all what is left for the children to rely on in this area is their personal observations over their peers and siblings plus their observations over their own experiences. There is no doubt, however, that children's judgements about human reality and human behaviour are somehow affected by the stereotypes of the contemporary European world outlook. In this study, the effect was˙ clearly visible, for instance, in children's views on the causes of moral transgressions: 'the naughty character', 'the lack of discipline, 'the weakness of will power', etc. all these typical

popular explanations could well have been absorbed by the children from conversations they had with their adults, from books they red and other cultural impacts.

In sum, the development of children's judgements about metaphysical aspects of human reality (as well as about metaphysical problems of reality in general) as it reveals itself through findings collected in this study is a much more complex and rapid process than it has been usually supposed. It unfolds as a series of developmental changes which reflect the general structure of the rationalist European world outlook; this process is, however, rather bizarre and far from being straightforward linear progressive 'growth of understanding.' In fact, the process is so complex that it puts more questions than gives answers - questions that challenge further investigation.

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