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Higher and Lower Processes

The fundamental principle which drives Vygotsky's developmental psychology is the transition from "lower" psychobiological processes to "higher" conscious psychological functions. The former include reflexes, temperamental traits, and spontaneous, rudimentary conscious processes. The latter include developed, voluntary, mental functions and associated personality characteristics. In Vygotsky's words, psychological development consists in "the transition from direct, innate, natural forms and methods of behavior to mediated, artificial mental functions that develop in the process of cultural development".

Vygotsky argued that higher and lower functions are fundamentally different from each other in terms of origins, biological mechanisms, and mental features. Consequently, mature psychological functions comprise a novel system which is not derived from lower processes. Elementary psychobiological functions are not the basis of mature, complex, mental psychological phenomena. Nor do the lower processes remain intact and interact with higher processes. Instead, Vygotsky proposed a radical dichotomy between the two which grants real autonomy to higher psychological functions. They develop according to different pathways from lower functions and have their own characteristics. Rather than lower and higher processes forming a continuous gradation in which early processes engender later ones, comprise their components, and affect their character, psychological development requires the introduction of new mechanisms which generate novel, autonomous higher functions.

In contrast, higher, mature, complex psychological phenomena are stimulated and organized by social experience and they are mediated by, or depend upon, conceptual thinking. Vygotsky explains this difference in a succinct statement about lower and higher forms of attention:

the importance of the organic process, which lies at the foundation of the development of attention, decreases as new, qualitatively distinct processes of attentional development emerge. Specifically, we have in mind the processes of the cultural development of attention. When we speak of the cultural development of attention, we mean evolution and change in the means for directing and carrying out attentional processes the mastery of these processes, and their subordination to human control. . . Voluntary attention emerges owing to the fact that the people who surround the child begin to use various stimuli and means to direct the child's attention and subordinate it to their control ... and of itself, the organic, or natural, development of attention never could, and never will, lead to the emergence of voluntary attention (Vygotsky, 1981, pp. 193-194).

The Relative Autonomy of Psychology from Biology

If higher psychological functions are not derived from or continuous with lower psychobiological processes, and if biologically determined lower processes are sublated into, reorganized, and subordinated by socially organized higher processes, then the latter cannot be biologically determined. Of course, higher processes require a biological substratum; however, this substratum is non-determining, in contrast to the biological determination of lower processes. The biological substratum of higher psychological functions—which is primarily the neocortex of the brain—is extremely pliable in response to experience. Thus, the human brain enables, rather than directs or controls, socially organized psychological phenomena.

Vygotsky's social explanation of psychological development led him to repudiate biological explanations. He rejected, for example, the notion that psychological development parallels biological maturation. "In comparing the data of onto- and phylogenesis, we did not for a moment take the point of view of biogenetic parallelism, intending to find in the history of the development of the child a repetition and recapitulation of those forms of thinking that prevailed at previous states of human history ... We did not for a moment identify the process of concrete thinking of the child with the process of concrete thinking in the history of human development"

Vygotsky says that the purely descriptive study of external features is fruitless with respect to explanation, prognosis, and practical applications. It can be compared to those medical diagnoses that doctors made at the time when symptomatic medicine prevailed.

After the explanation that interests develop on the basis of development of tendencies and together with the development of interest, the whole character of relations to the environment changes, we do not find it at all surprising that the phases comprising the arithmetical progression during the period of sexual maturation are marked not only by a series of internal organic changes, but also by a reconstruction of the whole system of relations to the environment. After the explanation that development of interests includes an involution of former interests, we are not at all surprised that the transition of development from one phase to another is directly manifested mainly in the demise of old connections to the environment and that there are whole periods in the development of the child in which he rejects his environment.

This is why we can precisely track what seem like two basic waves in the development of interests during the transitional age: the wave of new tendencies that form an organic base for a new system of interests and then a wave of maturation of this new system built onto the new tendencies. In this respect, W. Peters (1927) completely justifiably proposed to distinguish two basic phases during the transitional period, the first of which he termed the phase of tendencies, and the second the phase of interests. It is understood that the distinguishing and designation are very conditional, but basically they completely accurately convey one of the main results to which a series of studies on the transitional age lead us. The first phase, the phase of tendencies, usually lasts about two years. It is characterized by Peters as a phase of negative display of interests, a phase of rebellion against authority, rapid and sharp change in moods, and sharp fluctuations in direction. For us, this phase is characterized mainly by the fact that it contains two basic points: first, the unfolding and dying off of formerly established systems of interests (the basis for the negative, protesting, rejecting character), and, second, the processes of maturation and appearance of the first organic tendencies that signify the onset of sexual maturation. Specifically, the combination of both points taken together characterizes what at first glance is a strange fact, that in the adolescent we can see as if a common general decrease, and sometimes even a complete absence of interests. The disruptive, devastating phase during which the adolescent finally concludes his childhood caused L. N. Tolstoy to term this period the "desert of adolescence."

Bühler marks the beginning of the phase with a completely distinct drop in productivity and capacity for activity even in the area of special giftedness and interests. (We note that in this case we have a beautiful illustration of the extent to which development of mechanisms of behavior, habits, and abilities does not parallel the development of interests, and we observe in the negative phase how deep the divergence is between the one process and the other.) Further, together with this decrease, we see inner discontent, anxiety, striving for isolation, self-isolation sometimes accompanied by a hostile attitude toward those around. The decrease in productive activity, demise of interests, and a general anxiety constitute the main distinct traits of the phase as a whole. The adolescent as if repels his environment. that which recently was the subject of his interest; sometimes negativism passes more smoothly and sometimes it manifests itself in the form of disruptive activity. Together with subjective experiences (depressed state, repression, and melancholy revealed in entries in diaries and other documents that disclose the internal, intimate life of the adolescent), this phase is characterized by hostility and a tendency toward arguments and infractions of discipline. The whole phase might be called the phase of a second negativism, since such a negative attitude usually is manifested in early childhood at the age of approximately three years.

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Kroh indicates that the disturbingly poor school success that is usually observed in the middle school in the fifth class even in adolescents who were until then good students can be explained by the fact that at this point a change occurs in purpose from visualization and learning to understanding and deduction. The transition to a new and higher form of intellectual activity is accompanied by a temporary decrease in capacity to work.

On a firm basis, Kroh characterizes the whole stage as a stage of disorientation in internal and external relations. At the point of transition, when the traits of the past which is dying off are mixed in the personality of the adolescent with traits of the imminent future, there is a certain change in the basic lines and direction and a certain temporary state of disorientation. Specifically at this time there is a certain divergence between the child and his environment. Kroh believes that in the course of the whole process of development there is never a greater separation between the human "I" and the world than during this period.

On the basis of his studies, Zagorovskii concludes that a substantial correction must be made in the positions of the authors who describe the negative phase. In his opinion, there is no doubt that negativism as a recognized phase in the development of the adolescent's interests, characterized by a detachment of the adolescent from his environment, does occur in human development. But Zagorovskii believes that the purely biological formula derived by Charlotte Bühler must be rejected. He thinks that the insupportability of this formula lies in the fact that negative reflexes with respect to the environment observed in higher mammals may in the human social sphere be inhibited or modified and may assume unique forms of expression. Rather, negativism may not appear in every life situation. To a significant degree, a sharp exhibition of these symptoms may be due to inadequacies of the pedagogical approach.

Authors-biologizers lose sight of the fact that the human adolescent is not only a biological and natural, but also a historical and social being and of the fact that together with social maturation and a growing of the adolescent into the life of the community that surrounds him, his interests are not poured into him mechanically like a liquid into an empty vessel, into the biological forms of his tendencies, but, in the process of internal development and reconstruction of the personality, themselves reconstruct the very forms of the tendencies, carrying them to a higher level and converting them into human interests, and themselves become internal component factors in the personality.

In the area of the study of thinking in the adolescent, pedology is overcoming the basic and radical prejudice and a fateful error that stands in the way of developing a correct conception of the intellectual crisis and maturation that are the content of the development of thinking in the adolescent. This error is usually formulated as a conviction that there is nothing essentially new in the thinking of the adolescent compared with the thinking of the younger child. Some authors, defending thinking, come to the extreme view that the period of sexual maturation does not mark the appearance in the sphere of thinking of any kind of new intellectual operation that a child of three cannot already do.

The break in its turn is due to another basic defect of the old psychology, especially child psychology; specifically, child psychology until recently lacked a proper scientific conception of the nature of higher mental functions. The circumstance that higher mental functions are not simply a continuation of elementary functions and are not their mechanical combination, but a qualitatively new mental formation that develops according to completely special laws and is subject to completely different patterns, had still not been assimilated by child psychology.

As syncretism, Piaget understands the undifferentiated combination of the most varied impressions that the child takes in simultaneously that comprise the initial nucleus of his perception. For example, when a five-year-old is asked why the sun does not fall, the child responds: "Because it is yellow"; "Why is the sun hot?" "Because it is high" or "Because there are clouds around it." All of these impressions simultaneously perceived by the child are merged into a single syncretic image, and for the child, these initial syncretic connections take the place of developed and differentiated temporal and spatial, causal and logical connections and relations.

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In this research, A. N. Leont'ev came across a most important fact: when the child is asked to explain why he matches a given proverb with a given sentence, the child frequently reconsiders his decision. The need to justify the match, to express in words and set out the course of his judgment for another leads to completely different results.

When the child, having matched two sentences syncretically, comes to explaining it aloud, he notices his mistake and begins to give a correct response. Observations showed that the child's justification is not simply a representation in words of what he has done—it represents the whole process of the child's thinking on new bases. Speech is never simply attached as a parallel series, it always represents a process.

This study had already been conducted when it became clear to us that, strictly speaking, we approached a fact long known in school practice from the other end. Let us recall the proven device of all schoolteachers who make pupils who solve a problem incorrectly solve it aloud. The pupil, in solving this same problem to himself, gives an absurd answer. When he is made to solve the problem aloud, the teacher teaches him to be conscious of his own operations, to follow their course, to correct it sequentially, and to control the course of his thoughts. We might say that in making the child solve the same problem aloud, the teacher transfers the child's thinking from the syncretic plane to the logical plane.

Never does the influence of the environment on the development of thinking acquire such great significance as specifically at the transitional age. Then as the intellect develops, the city and the village, the boy and the girl, children of various social and class levels are distinguished more and more. Obviously, the process of development of thinking at this age is directly affected by social factors. In this we see the direct confirmation of the fact that the adolescent's main successes in the development of thinking are in the form of cultural development of thinking.

Not biological development of the intellect, but mastery of historically developed synthetic forms of thinking comprises the principal content at this age. This is why the series of monographs that Kroh cites show that the process of intellectual maturation in different social strata presents a very different picture. External factors that form intellectual development assume a decisive significance in the transitional age: the intellect acquires methods of action that are the product of socialization of thinking and not of its biological evolution. Kroh, as we shall see, establishes that subjective and visual images begin to fall away at approximately age 15-16. In the author's opinion, the main reason for this is the adolescent's development of language, socialization of his speech, and development of abstract thinking. The visual bases for speech diminish. Conceptions that are the basis for words lose their specific meaning. In the child, the visual experience determines the content and frequently also the form of the child's expression. In the adult, speech depends much more on its own bases. In words-concepts, it has its material in grammar and syntax, its normal rules of formulation. Language more and more separates from visual conceptions and becomes more autonomous to a significant degree. This process of automatization of speech occurs predominantly during the transitional age, as Kroh assumes.

H. Jaensch, the author of studies on eidetism, correctly indicates that during historical human development also, in the transition from primitive to developed thinking, speech played a decisive role as a means of liberation from visual images. Remarkable in this respect is the fact, pointed out by Kroh, that in deaf-mute children eidetic images can be found even when they have almost disappeared in their peers. This is indisputable evidence that elimination of eidetic images is influenced by the development of speech.

Since soon after finishing school, the adolescent enters the kind of environment in which higher forms of thinking have not been mastered, it is natural that he himself does not reach a higher degree of development, although he displays great ability. It cannot be more decisively confirmed that the formation of concepts is the product of the cultural development of the intellect and depends in the last analysis on the environment.

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DEVELOPMENT OF HIGHER MENTAL FUNCTIONS DURING THE TRANSITIONAL AGE

The development of higher mental functions during the transitional age reveals most clearly the patterns that characterize the process of development of the nervous system and behavior.

One of the basic laws of development of the nervous system and behavior is that as higher centers or higher formations develop, lower centers or lower formations yield a substantial part of their former functions to the new formations, transferring these functions upward so that the tasks of adaptation that are done by lower centers or lower formations at lower stages of development begin to be done by higher functions at higher stages.

In this case, however, in the words of E. Kretschmer, the lower centers do not simply move aside as the higher centers gradually develop but continue to work in a common union as a subordinate unit directed by the higher centers (younger in the history of development) so that in an undamaged nervous system, they usually cannot be considered separately.

Kretschmer maintains that only in a pathological state, when the higher centers are functionally weak or separated from the subordinate centers, does the general function of the nervous apparatus not simply stop, but the subordinate unit becomes independent and exhibits elements of its old type of functioning which had remained in it. Kretschmer formulates this general neurobiological law as follows: if within the psychomotor sphere, the action of the higher unit becomes functionally weak, then the closest lower unit becomes independent and operates within its own primitive laws.

The three basic patterns, observed in the development of the nervous system. specifically—preservation of lower centers in the form of separate stages, transition of functions upward, and emancipation of lower centers in pathology—conform perfectly to the history of development of mental functions. Specifically, all mental development during the transitional age is an example of the concrete expression of these three basic patterns.

As we have said, the principal content of development during this age is a change in psychological structures of the adolescent's personality, a change consisting in the transition from elementary and lower processes to a maturation of the higher processes. Higher functions develop according to completely different laws than the elementary or lower functions. Their development does not occur in parallel with the development of the brain and the appearance in it of new sections or growth of older sections. They are a different type of development, a different type of mental evolution. These higher functions that are the product of the historical development of behavior arise and are shaped during the transitional age in direct dependence on the environment that develops during the process of social-cultural development of the adolescent. They usually are not constructed together with the elementary functions as new members in the same series nor above them as an upper story of the brain above the lower; they are constructed according to the pattern of development of new complex combinations of elementary functions through the development of complex syntheses.

If we look at a pencil, placing it close to our eyes and then move it ten times farther away, the image on the retina also decreases by a factor of ten. It will equal the image that a pencil ten times smaller would make when looked at if placed at the first distance. However, a pencil moved ten times farther away from the eyes does not seem to us to be ten times smaller. We know how to distinguish its size from the size of a pencil that is ten times smaller placed right in front of our eyes.

Precisely so, as E. Hering has noted, a piece of coal at noon reflects three times more light than a piece of chalk at dawn. Regardless of this, even at dawn chalk seems white and coal at noon remains black. Precisely so, in the perception of one and the same object from very different sides, from different angles of sight, its form always seems to us to be constant although the real reflection of this form on the retina varies endlessly.

What is the source of the constancy of our perception, its independence of accidental changeable conditions? H. Helmholtz expressed the hypothesis that unconscious deductions are working in this case. Later studies showed that what operates here are complex processes of combination, fusion of present stimulation and stimulation produced from memory and that the real process of perception always includes certain correctives introduced into it by memory. Looking at an object, we not only perceive it, but also remember it. Behind the process of perception there is, in essence, a complex process of uniting present sensations and eidetic images.

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Modern logicians and psychologists, in Bühler's opinion, are inclined to believe that higher vertebrates use concepts, indicating, for example, the fact that a dog recognizes his master in various clothing and in various situations and chases any rabbit as a rabbit regardless of its different external appearance. But at best, Bühler believes that here we must speak only of precursors of human concepts because animals lack the most important thing, specifically the ability to name things.

Without exaggerating, we can say that primitive thinking at early stages of development in onto- and phylogenesis is essentially only the function of memory. Moreover, at primitive stages, memory contains three different functions in an undifferentiated form: remembering, imagining, and thinking.

The study brought Schmitz to an incontrovertible result: children age 10-11 answer a question posed in a general form, as is usually done in testing, not by judging the general character, but almost always with a concrete judgment. The question elicits in them some kind of definite experience with which the question has only external or verbal similarity. Schmitz assumes that the child brings up this recollection and uses it as a basis for his answer, which frequently does not at all convey what is most essential in the experience, but only isolates some component that is dominant because it was colored with emotion or connected with other elements.

If in the child, intellect is a function of memory, then in the adolescent, memory is a function of intellect. Just as the primitive thinking of the child depends on memory, the memory of the adolescent depends on thinking; while in the child a concrete-graphic and practical content is hidden behind an evident verbal form, in the adolescent, real concepts are hidden behind the outward appearance of images in the memory. This central factor in the history of the development of memory has not been adequately studied thus far.

Finally, as a summary of his thinking, Ribot formulates the idea that voluntary attention is a sociological phenomenon. Considering it as such, we will better understand its genesis and instability. Voluntary attention is adaptation to conditions of higher social life.

Even here, we must approach voluntary attention as a product of the cultural development of the child; we must see in voluntary attention a form of adaptation to higher social life and we should expect it to display patterns typical for the whole course of the cultural development of behavior.

The most elementary function of attention, involuntary attention, like memory is more plastic and richer in the child than in us. The narrowness of the child's field of attention does not consist of the fact that the child perceives few things; he perceives more of them than the adult and with a greater number of details, but this attention is organized completely differently. He does not have what might be called control itself of the mechanisms of attention that would control this process and subject it to his will.

In this sense, Piaget is right in referring to the studies of Revault d'Allones, who distinguishes two basic forms of attention: direct attention and indirect, instrumental attention. The latter is characterized by the fact that between the object of attention and the thinking person, another factor intervenes—it is the means by which a person actively directs his attention to an object which does not interest him directly and does not directly attract his action, but to which he wants nevertheless to direct his attention.

We were able to show the substantial difference of the transitional age, which is expressed in the fact that relations existing between memory and intellect are inverted. If during childhood, thinking is a function of memory, then in the transitional age, memory becomes the function of thinking. We could show with an equal basis that the same thing happens with respect to perception and action of the child. At an early age, and in general, at primitive stages of development, thinking is the function of perception of the visual field. To think means to analyze one's perceptions. During the transitional age, to perceive means to think of the visual in concepts, to synthesize the concrete and the general. Perception becomes a function of thinking.

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A. Gelb formulates this same idea paradoxically, but completely correctly when he recalls the statement of J. Herder that the language of thinking is a free language. Gelb carries this idea further, saying that only man is capable of doing something senseless. This is absolutely true. An animal cannot do anything senseless from the point of view of the concrete situation or operation. An animal does only what he is moved to do by internal prompting or external stimuli. Doing what is voluntary, intentional, free, senseless from the point of view or the situation is impossible for the animal.

Thus, we see that the child's logical deliberation is as if an argument transferred to within the personality and, in the process of the child's cultural development, the group form of behavior becomes an internal form of behavior of the personality, the basic method of his thinking. The same might be said of the development of self-control and voluntary direction of one's own actions which develop in the process of children's group games with rules. The child who learns to conform and coordinate his actions with the actions of others, who learns to modify direct impulse and to subordinate his activity to one rule or another of the game, does this initially as a member of a small group within the whole group of playing children. Subordination to the rule, modification of direct impulses, coordination of personal and group actions initially, just like the argument, is a form of behavior that appears among children and only later becomes an individual form of behavior of the child himself.

All theories of child development can be reduced to two basic conceptions. According to one, development is nothing other than realization, modification, and combination of deposits. Nothing new develops here—only a growth, prancing, and regrouping of those factors that were already present at the very beginning. According to the second conception, development is a continuous process of self-propulsion characterized primarily by a continuous appearance and formation of the new which did not exist at previous stages. This point of view captures in development something essential to a dialectical understanding of the process.

In its turn, it allows both idealistic and materialistic theories of personality construction. In the first case, it finds its embodiment in theories of creative evolution directed by an autonomous, internal vital surge of the purposeful self-developing personality, by the will toward self-affirmation and self-perfection. In the second case, it leads to an understanding of development as a process that is characterized by a unity of material and mental aspects, a unity of the social and the personal during the child's ascent up the stages of development.

Actually, at certain age levels, development is marked by slow, evolutionary, or lytic flow. These are age levels of predominantly smooth and frequently unremarkable change in the child's personality, change that is accomplished by insignificant "molecular" attainments. Here, over a more or less long time that usually takes several years, no fundamental, abrupt shifts and alterations occur that reconstruct the child's whole personality. More or less remarkable changes in the child's personality occur here only as a result of a long-term cryptic "molecular" process. They appear outside and are accessible to direct observation only as a conclusion of long-term processes of latent development.

Stable age periods have been studied significantly more fully than those that are characterized by another type of development—crises. The latter are disclosed purely empirically and thus far have not been brought into the system, have not been included in the general division of child development into periods. Many authors even doubt that there is any internal need for their existence. They are more inclined to take them as "diseases" of development because of its deviation from the normal path.

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From a purely external aspect, these periods are characterized by traits which are the opposite of the firm or stable age levels. During these periods, abrupt and major shifts and displacements, changes, and discontinuities in the child's personality are concentrated in a relatively short time (several months, a year or at most, two). In a very short time, the child changes completely in the basic traits of his personality. Development takes on a stormy, impetuous, and sometimes catastrophic character that resembles a revolutionary course of events in both rate of the changes that are occurring and in the sense of the alterations that are made. These are turning points in the child's development that sometimes take the form of a severe crisis.

The second feature of critical age levels served as a departure point for empirical study. The fact is that a significant proportion of children who experience critical periods of development are difficult children. These children seem to drop out of the system of pedagogical influence that until very recently provided a normal course for their training and education. In children of school age during critical periods, there is a drop in rate of success, a slacking of interest in school work, and a general decline in capacity for work. At critical age levels, the child's development frequently is accompanied by more or less sharp conflicts with those around him. The child's internal life is sometimes connected with painful and excruciating experiences and with internal conflicts.

True, it is far from always that all of this occurs. In different children, critical periods occur differently. During the passage of a crisis even in children most alike in type of development and in social situation, there is much greater variation than during the stable periods. Many children do not exhibit at all clearly any of the traits of difficult children or any decline in school success. The range of variation in the passage of these age levels in different children and in the influence of external and internal conditions on the course of the crisis itself is so great and significant that this caused many authors to question whether crises of child development in general are not a product of exclusively external unfavorable conditions and whether they should therefore be considered the exception rather than the rule in the history of child development (A. Busemann et al.).

The concepts of separate critical ages were introduced into science by the empirical path and in a random order. The crisis of age seven was discovered and described before the others (the seventh year in the life of the child is transitional between the preschool and the adolescent periods). The seven- to eight-year-old child is no longer a preschooler, but not yet an adolescent. The seven-year-old differs from both the preschool child and from the school child and for this reason presents difficulties with respect to his teaching. The negative content of this age is apparent primarily in the disruption of mental equilibrium and in the instability of the will, mood, etc.

The crisis of the newborn separates the embryonal period of development from infancy. The one-year crisis separates infancy from early childhood. The crisis at age three is a transition from early childhood to preschool age. The crisis at age seven is a link that joins preschool and school ages. Finally, the crisis at age thirteen coincides with the turning point in development at the transition from school age to puberty. Thus, an ordered picture opens before us. Critical periods alternate with stable periods and are turning points in development, once again confirming that the development of the child is a dialectical process in which a transition from one stage to another is accomplished not along an evolutionary, but along a revolutionary path.

Crisis of the newborn.

Infancy (two months to one year).

Crisis at age one.

Early childhood (one to three years).

Crisis at age three.

Preschool age (three to seven years).

Crisis at age seven.

School age (eight to twelve years).

Crisis at age thirteen

Age of puberty (fourteen to eighteen years).

Crisis at age seventeen.

The Problem of Age and the Dynamics of Development

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We already know that the child's chronological age cannot serve as a reliable criterion for establishing the actual level of his development. For this reason, the determination of the actual level of development always requires special study which serves to establish a diagnosis of development. Determining the actual level of development is the most essential and indispensable task in resolving every practical problem of teaching and educating the child, checking the normal course of his physical and mental development, or establishing disturbances of one kind or another in development that upset the normal course and make the whole process atypical, anomalous, and in some cases pathological. Thus, the determination of the actual level of development is the first and basic task of the diagnostics of development.

Speaking of imitation, we do not have in mind mechanical, automatic, thoughtless imitation but sensible imitation based on understanding the imitative carrying meaning of the term, using it only in the sphere of operations that are more or less directly connected with mental activity of the child. On the other hand, we extend the meaning of the term, applying the word "imitation" to all kinds of activity of a certain type carried out by the child not independently, but in cooperation with adults or with another child. Everything that the child cannot do independently, but which he can be taught or which he can do with direction or cooperation or with the help of leading questions, we will include in the sphere of imitation.

Using an example, we shall elucidate how the zone of proximal development is determined. Let us assume that as a result of a study, we established that two children are the same in age and mental development. Let us say that both are eight years old. This means that both independently solve problems of the level of difficulty that corresponds to the standard for age eight. In this way, we determine the actual level of their mental development. But we continue the study. Using special devices, we test to what extent both children are able to solve problems that are beyond the standard for age eight. We show the child how such a problem must be solved and watch to see if he can do the problem by imitating the demonstration. Or we begin to solve the problem and ask the child to finish it. Or we propose that the child solve the problem that is beyond his mental age by cooperating with another, more developed child or, finally, we explain to the child the principle of solving the problem, ask leading questions, analyze the problem for him, etc. In brief, we ask the child to solve problems that are beyond the limits of his mental age with some kind of cooperation and determine how far the potential for intellectual cooperation can be stretched for the given child and how far it goes beyond his mental age.

It develops that one child solves problems cooperatively that standards relate to, let us say, age twelve. The zone of proximal development moves his mental age forward by four years. The other child moves forward with cooperation only to the standard age level of a nine-year-old. His zone of proximal development is only one year.

This kind of diagnosis of development, fruitless with respect to explanation, prognosis, and practical applications can be compared only to those medical diagnoses that doctors made at the time when symptomatic medicine prevailed. The patient complains of a cough, the doctor makes a diagnosis: the illness is a cough. The patient complains of a headache, the doctor makes a diagnosis: the illness is a headache. This kind of diagnosis is essentially empty since the investigator adds nothing new to what he knew from observations of the patient himself and plays back to the patient his own complaints, supplying them with scientific labels. The empty diagnosis cannot explain the observed phenomena, can predict nothing relative to their fate and cannot give practical advice. A true diagnosis must provide an explanation, prediction, and scientific basis for practical prescription. The matter is precisely the same with respect to symptomatic diagnosis in psychology. If a child is brought in for consultation with complaints that he is developing poorly mentally, has a poor imagination and is forgetful, if after investigation, the psychologist makes the diagnosis: the child has a low intelligence quotient and mental retardation, the psychologist also explains nothing, predicts nothing, and cannot help in any practical way, like the doctor who makes the diagnosis: the illness is a cough.

The most important significance of the corpus striatum is carrying out static, simultaneous functions of the brain, regulation of muscle tonus, inhibition and regulation of corpus pallidum functions, regulation of timely inhibition and release of the whole complex of agonists and antagonists; accuracy of all movements depends on the synergy of these. This same system is related to the primary automatisms such as mimicry, gesticulation, expressive movements, etc.

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Peters, it seems to us, quite correctly explains imitation in infancy and in early childhood by the unique consciousness of mental intercourse. The child is capable much earlier of real imitation than of repeating movements that arise through a purely associative path. Intercourse as a mental fact is internal motivation, imitative action on the part of the child. He merges in his activity directly with the one he imitates. The child never imitates the movements of nonliving objects, for example, the swing of a pendulum. Obviously, his imitative actions arise only when there is personal communication between the infant and the person whom he imitates. This is why imitation is so little developed in animals and so closely connected with understanding and with intellectual processes.

With Peters, we may accept the graphic comparison of the activity of a child who is at this stage of development of consciousness with that of any small children playing ball: in playing ball, we have a complete merging of "I" and "you" in a single action of the internal "we."

Actually, imitation must evidently be referred to a number of specifically human features. The studies of W. Köhler showed that imitation of the ape is limited to the narrow range of its own intellectual potentials. Imitation of a complex, sensible, and purposeful action never is successful without an understanding of the structure of the situation. Thus, the chimpanzee may imitate only such actions as lie within the zone of his own intellectual potentials. All studies of imitation in apes show that apes are very poor at aping. Not only do we not observe the exceptional effort to imitate, famous in fables, but the potential for imitation even in the higher apes is immeasurably poorer than in man. Imitation in the animal is distinguished by being limited to the zone of his own potentials. For this reason the animal cannot learn anything new through imitation. In the child, on the contrary, with the help of imitation, new behavior develops which had never existed before in his experience.

Speech is termed autonomous because it is constructed seemingly according to its own laws different from the laws of construction of real speech. This speech has another sound system, another sense aspect, other forms of communication, and other forms of connection. For this reason, it was called autonomous.

Thus, the first rule is that children's autonomous speech is a necessary period in the development of every normal child.

The second rule: in many forms of underdevelopment of speech, in disruption of speech development, children's autonomous speech appears very often and determines the features of the anomalous forms of speech development. For example, retardation is often expressed primarily in the lingering on of the child's autonomous speech. Other speech disruptions in childhood also result in autonomous speech continuing sometimes for several years but nevertheless fulfilling the basic genetic function, that is, serving as a bridge across which the child makes the transition from the mute period to language. In the development of the normal and the anomalous child, autonomous speech plays an essential role.

THE CRISIS AT AGE THREE

The first symptom, which characterizes the onset of the crisis, is the development of **negativism**. We must clearly see what we are talking about here. When people speak of children's negativism, it must be distinguished from ordinary disobedience. In negativism, all of the child's behavior goes contrary to what adults require of him. If the child does not want to do something because it is unpleasant for him (for example, he is playing and is told to go to bed, but he doesn't want to), this is not negativism. The child wants to do what attracts him, for which there is a drive, but he is forbidden to do it; if he does it anyway, this would not be negativism. This would be an act of refusing to acquiesce to the demand of the adults, a reaction that is motivated by the strong wish of the child.

As negativism, we will consider such manifestations in the behavior of the child when he does not want to do something only because an adult told him to, that is, this reaction is not a reaction to the content of an action, but only to the request of adults. As a distinguishing mark from ordinary disobedience, negativism consists in the fact that the child does not do something because he was asked to. The child is playing outside and he doesn't want to go in. He is told to go to bed, but he doesn't do it regardless of the fact that his mother asks him to. And if she asked him to do something else, he would do as he pleased. In a reaction of negativism, the child does not do what he is asked to do specifically because he is asked to. What happens here is a unique shift in motivation.

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A negative reaction differs from ordinary disobedience in two essential points. First, in this case, social relations, relations to another person, are at the forefront. With this kind of action of the child, the reaction is not motivated by the content of the situation itself: does the child want to do what he is asked to do or not. Negativism is an act with a social character: it is addressed primarily to the person and not to the content of what the child is asked to do. The second essential point is the new relation of the child to his own affect. The child does not act directly under the influence of the affect, but acts counter to his tendency. Apropos the relation to affect, I will recall early childhood before the crisis at age three. From the point of view of all studies, most characteristic for early childhood is the complete unity of affect and activity.

The second symptom of the crisis at age three is stubbornness. If we must be able to distinguish negativism from ordinary stubbornness, then we must be able to distinguish stubbornness from persistence. For example, the child wants something and persistently insists that it be done. This is not stubbornness, this occurs even before the crisis at age three. For example, the child wants to have something, but cannot get it immediately. He tries persistently to be given the thing. This is not stubbornness. Stubbornness is the reaction of the child when he insists on something not because he wants it very much, but because he demands it. He persists in his demands. Let us say that the child is called to come in from outside; he refuses, he is given reasons that are convincing, but because he has already refused, he does not go in. The motive for stubbornness is the fact that the child is bound by his initial decision. Only this is stubbornness.

A third point is referred to by the German word "Trotz." The symptom is considered to be so central for this age that the whole critical age has been called "trotz alter," or in Russian, the age of obstinacy.

How does this symptom differ from the first two? Obstinacy differs from negativism in that it is impersonal. Negativism is always directed against an adult who is urging the child to do something or other. Obstinacy is more apt to be directed against norms of rearing established for the child, against the way of life; it is expressed in a unique childish dissatisfaction that evokes a "da nu!" [not really!], with which the child responds to everything that he is asked to do. Here an obstinate attitude is apparent not with respect to the person, but with respect to the whole way of life that developed up to the age of three, with respect to norms that are proposed, toward toys that interested him previously. Obstinacy differs from stubbornness in that it is directed outward, with respect to the external, and is evoked by the child's drive to insist on his own way.

Then there is the fourth symptom, which the Germans call "Eigensinn" or self-will, willfulness. It consists of a tendency of the child toward independence. This did not exist previously. Now the child wants to do everything himself.

Of the symptoms of the crisis we are analyzing, there are three more, but they are secondary in importance. The first is protest-rebellion. Everything in the child's behavior begins to have a protesting character in a number of different manifestations, something that could not exist earlier. The whole behavior of the child acquires traits of protest as if the child found himself in a state of war with those around him, in a constant conflict with them.

Finally, there is a symptom with two respects that is manifested differently in different families. In a family with a single child, it occurs as a drive toward *despotism*. The child exhibits a desire to exercise despotic power over those around him. Mother must not leave home, she must sit in the room as he wants her to. He must be given everything he wants: not what he does not want, but what he wants. The child finds a thousand ways to exercise power over those around him. At this point, the child tries to reestablish the state that existed in early childhood when actually all of his wishes were carried out and to become the master of the situation. In a family with several children, this symptom is called the symptom of jealousy-with respect to the younger or the older if there are other children in the family. In this case, the same tendency toward control, toward despotism, toward power, appears as the source of a jealous attitude toward the other children.

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Of course, the essential difference between the child's environment and that of an animal is that the human environment is a social environment, that the child is a part of a living environment and that the environment never is external to the child. If the child is a social being and his environment is a social environment, then it follows from this that the child himself is a part of this social environment. Consequently, the most essential turn-around that must be made in the study of the environment is the transition from absolute to relative indicators; the environment of the child must be studied: most of all, we must study what it means for the child, what the child's relation to the separate aspects of this environment is. Let us say that the child does not talk before he is a year old. When he starts to talk, the speech environment of those around him remains unchanged. And for the year before and the year after, in absolute indicators, the speech culture of those around him did not change at all. But I think that everyone will agree that from the minute the child began to understand the first words, when he began to pronounce the first deliberate words, his relation to speech factors in the environment, the role of speech in relation to the child changed a great deal.