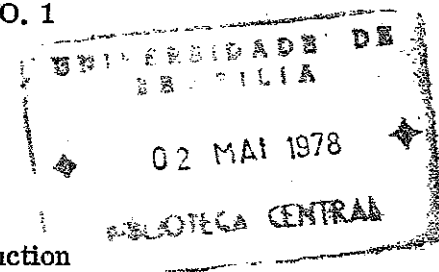


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TABLE OF CONTENTS



MICHAEL COLE: Introduction	3
L. I. BOZHOVICH: The Concept of the Cultural-Historical Development of the Mind and Its Prospects	5
L. I. BOZHOVICH: Some Psychological Aspects of School Readiness	23
Ya. Z. NEVEROVICH: The Development of Motor Acts with Objects in the Preschool Child	35
A. N. LEONT'EV: A New and Simple Test for Studying the "Practical Intelligence" of Preschool and Mentally Retarded Children	46
A. N. LEONT'EV: The Dialectical Method in the Psychology of Memory	53
Ya. V. BOL'SHUNOV: Recall of Semantically Nonequivalent Parts of a Coherent Text	70
G. M. DUL'NEV: The Importance of Intentionality in Accurate and Complete Text Recall (Comparative Study of Mentally Retarded and Normal Schoolchildren)	81

acquisition of voluntary responding in the child.

The two articles by Leont'ev give us insight into the early formulation of the dialectical-materialist perspective that was so conspicuous a feature of the approach of Vygotsky and his followers (among whom Leont'ev has been the most prominent theoretician). Leont'ev's brief description of a simple "test" for mediated choice behavior is not only ingenious but a fine example of early efforts to translate theory into observation.

The final article, by Dul'nev, is intriguing for somewhat different reasons. For a number of years it has been fashionable among American scholars to assume that Soviet psychological research ceased abruptly in 1936 with the Decree of the Central Committee of the Communist Party on psychological testing. What ceased abruptly were the journals that had, up to that time, published psychological research. A good deal of research also ceased, or was reorganized. But research did go on. Dul'nev's study was published in 1940, in a volume of studies co-edited by L. Zankov, one of Vygotsky's collaborators (Zankov with others has recently completed a monograph, Teaching and Development, published by M. E. Sharpe, Inc. in 1977). The problem he is writing about is squarely in the center of current American research on recall of meaningful text and comprehension-recall deficits associated with mild mental retardation. Although current investigators will want to replicate his observations, the techniques he reports offer an interesting approach to the problem of mediational and production deficiencies in the recall of the retarded.

Michael Cole
Editor

L. I. Bozhovich

THE CONCEPT OF THE CULTURAL-HISTORICAL DEVELOPMENT OF THE MIND AND ITS PROSPECTS

Vygotsky's concept of the cultural and historical development of the mind, which he worked out together with his co-workers and students, never achieved finished form. It did, however, contain basic ideas that, when later systematically developed, opened paths toward knowledge about what Vygotsky considered to be the most important problem of psychology — knowledge of the human personality.

Central to Vygotsky's concept was the notion that new, systematic structures are formed during the process of ontogenesis, i.e., individual development. These new structures are the outcome of the subject's having assimilated the products of human culture. Vygotsky saw the essence of this development as follows: Mental or psychological functions (that initially are elementary (natural) are mediated in the process of activity and social contact with others through a socially elaborated system of signs. This mediation alters the content and structure of these functions, and the result is mind, a phenomenon specific and unique to human beings as social creatures.

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Thus, in Soviet psychology Vygotsky pioneered concrete psychological studies employing a historical approach to the study of the human mind.

It is difficult to do justice to the full content and variety of the ideas that stem from Vygotsky's concept. The most important of them are known not only from Vygotsky's own published works but also from studies that further developed and expanded them. Some of the ideas are: the view that activity plays a dominant role in human mental development; the idea that the higher mental processes and functions are the result of internalization of interpersonal forms of communication and activity; and the notion that the emergence of the higher forms of mental life is related in some way to the formation of new physiological structures.

The purpose of the present article is to trace the logic of the development of Vygotsky's scientific thought, to outline its general features, and to determine the possible directions that further studies based on it might take. We should point out that this logic is also the logic of the empirical facts on which Vygotsky always drew in working out his concept of the psychological aspect of the human personality as a complex, structured system.

I

Vygotsky continually stressed his view that the chief concern of psychology was the human personality. In his criticism of traditional psychology for being divorced from real life, Vygotsky observed: "Psychology until now has approached man's inner life metaphysically. . . . It separated mental processes from the integral, whole person and his integral personality and viewed them in isolation. It was perforce condemned to operate with empty abstractions." (1) Elsewhere he asserts, "Until now the central and most important problem of the whole of psychology, namely, that of the personality and its development, has remained a closed book for child psychology as well" [6. P. 60].

It is not unreasonable, therefore, to say that the entire logic of Vygotsky's scientific thought was aimed at a final resolution of this problem. Yet he realized that to do this, psychology had to find other paths than those it had traversed in the past. He wrote:

In the person of its best representatives, child psychology has come to the conclusion that the description of man's inner life as a whole belongs to the poet's or historian's art. This is essentially a declaration of bankruptcy, a testimony to the shaky underpinnings of child psychology, a confession of the impossibility in principle of studying the problem of the personality within the methodological framework that set the stage for the emergence and development of child psychology in the first place. Only a resolute break with the methodological constraints of traditional child psychology can bring us to a study of that higher mental synthesis which has been quite correctly called the personality of the child [6. P. 60]

Our purpose in the present article — to trace the development of Vygotsky's theory of mental development — has been made easier by a paper he read on October 2, 1930 (2), in which he tried to map the path traversed by his research up until then and to outline its further prospects. "What I am about to discuss with you," he said, "has grown out of our experiments together; it is an attempt, albeit an unfinished one, to map the theoretical contours of an approach that has guided a number of our studies, namely, the effort to bring together two lines of research, the developmental and the pathological."

Essentially this was an attempt to outline the new problems that had arisen from a comparison of data obtained in studies of the development of complex functional systems in the course of the child's overall mental development and then, later, in studies of the disintegration of these systems as the adult becomes ill.

This talk reflected Vygotsky's own attitude toward the general orientation of his original studies and toward the fact that he saw where these studies were leading only in the most general outlines, which were occasionally quite vague even for him.

In its very first stages, Vygotsky's study of the child's mental development led him to the following cardinal position. Mental development proceeds along two lines. It includes the process of maturation, i.e., the refinement and perfection of the systems and tissues that constitute the organic basis of any mental process, and, secondly, it includes cultural development, which involves the emergence of new mental structures. When the child learns to master tools such as language, mathematical symbols, letters, etc., the structure of his mental processes undergoes a change (these processes become mediated) and becomes more perfected and productive. This development, in contrast to maturation, Vygotsky called functional.

During this period the chief method used by Vygotsky and his colleagues in their empirical psychological studies was a method of double stimulation. Essentially, the subject (usually a child of a certain age) would be presented with a specific psychological task (e.g., to remember a list of words) and a system of devices or instruments that would enable him to perform the task successfully (e.g., pictures). The experimenter then studied whether the child used these instruments and, if so, in what way, how his activity changed, and what sort of modification took place in the mental function that was being studied in the particular experiment. (A. N. Leontev's book [8] gives an impressive description of this stage of the research.)

Other psychologists had previously called attention to the emergence of the ability to employ various means and instruments to improve performance in mental activity. In particular, Binet had pointed it out in his study of the exceptional memory of one of his subjects. He, like all the others, however, saw this as a fictive development; and when he encountered it in memory, he called it the simulation of basic memory.

Vygotsky objected strongly to this viewpoint, which he considered the result of the faulty methodology that was at that time prevalent in child psychology.

In Vygotsky's view, the chief psychological error of traditional child psychology was its global, undifferentiated approach to mental development. It did not perceive that the historical and biological lines of development that in phylogenesis seem to be independent and self-contained (and in fact are even covered by different fields of psychology) in ontogenesis, or individual development, come together and fuse into one single (though not undifferentiable), complexly organized process. Clarity on this point, according to Vygotsky, was a necessary precondition for the proper study of human mental development [4. P. 38]. Later research proved him right.

A study of language and thought, perception, memory, attention, and other mental functions showed that as the individual learned the cultural forms of conduct and behavior, genuine qualitative changes took place both within these functions and in the way they were interrelated.

An analysis of how a child remembers with the aid of pictures showed that his memory relied not so much on natural memory capacities as on the use of the instruments and devices offered him as memory aids. He compared the thing to be remembered with a particular device, found what was similar and what was different in them, sometimes made artificial and arbitrary associations among them, and thus, by means of thought, solved his memory task. In a certain sense memory is replaced by thought; and in the final analysis, this gives birth to a special kind of memory, with its own special structure, namely, logical memory, in which reasoning, now enlisted to resolve a problem that is not specific for it, loses many of its features, whereas natural memory, developing now through the aid of reasoning, acquires a unique structure of its own. This new, higher, mental function that emerges during the course of development is not just memory plus reasoning: it is an indivisible whole, which cannot be broken down without

eliminating the function itself. This new structure is the outcome of the historical, not the biological, line of child development and is specific to man.

A study of other mental functions reveals the same pattern: as the individual develops, they begin to be mediated, intellectualized, and rendered voluntary, i.e., they become conscious and controllable by the will. Perception becomes categorical, thinking becomes conceptual, attention becomes voluntary, etc.

The leading methodological approach at this stage is the investigation of mental phenomena as unitary wholes. Just as one cannot, to use Vygotsky's example, study the properties of water by breaking it down into hydrogen and oxygen, since these elements have completely different, and in fact even diametrically opposed, properties, so it is impossible to study the higher mental functions by breaking them down into their primary constituents. (They are united, so to speak, in an organic, not a mechanical, way.) Vygotsky thought that great harm had been done to classic psychology by its failure to understand this point and by the element-by-element approach it used; because of this it was incapable of inquiring into either the process of development or the complex forms of human mental life, to say nothing of being able to study the human personality.

It was undoubtedly this historical, materialist, systemic approach to the study of integral psychological structures Vygotsky had in mind when he spoke of the need to go beyond the methodological limitations of traditional psychology.

At the next stage of his research Vygotsky's notions of mental development became even more complicated. In his talk (October 2, 1930) he said that the conceptual system he wanted to outline was much more complicated than the system he and his fellow workers had used up to that time, although even this new system was much simpler than the actual complexity of the actual psychological processes they were meant to study. (It seems that this new stage in the development of Vygotsky's scientific concept was directly related to his coming to a neurological and psychiatric clinic, which gave him the chance to

compare data on the development and disintegration of psychological structures.)

The main thought dominating this period was that development was accompanied by changes not so much in the structure of individual mental functions as in the connections and relations among these functions. The modification of these connections and relationships gives rise to new kinds of higher mental functions that had not existed in the preceding stages of development. Vygotsky called these interfunctional structures psychological systems.

Following this line of reasoning, he began to look at the development of even particular mental functions as the formation of psychological systems — although, to be sure, simpler ones. Vygotsky then came to believe it necessary to study first the more complex systems of which the higher psychological functions were a part and which constituted human consciousness.

Also at this stage Vygotsky expressed the view that the higher mental functions and their more complex systems were not related in an elementary or natural way to the personality. In contrast to primitive, unmediated responses (which are characteristic of animals, small children, and some patients), these relations are active manifestations of the individual personality [8. P. 118]. Any reaction, any response of a human being is mediated by his personality, the highest and most structured system he has, and in this way acquires a conscious and voluntary character. "The development of the personality and the development of individual responses are essentially two aspects of the same process" [6. P. 119]; hence "in tracing the cultural development of mental functions we are, at the same time, mapping the path of development of the personality" [6. P. 118]. Vygotsky regarded this approach as fundamental to psychology, since it was pointing in the direction of creating a genuinely human psychology. "Psychology," he said, "is becoming human" [6. P. 118].

On what empirical facts did Vygotsky base his research during this period, and what generalizations and hypotheses did he formulate?

From his analysis of the age-linked developmental characteristics of children Vygotsky concluded that at each stage in development a child's consciousness has specific, qualitatively distinct, structural features. "It is difficult to compare the memory of a child at this age (1-3 years), his thinking, and his attention with the memory, thinking, and attention of an older child. This difficulty stems from the fact that we find here a specific system of functional relationships, a specific system of consciousness, in which the dominating function is perception, all other functions operating exclusively through and as the result of it" [6. P. 369]. Indeed, the memory of the small child is manifested as recognition, thinking is ideational and geared to action, and emotions occur as a result of what the child perceives at the particular moment: he cries bitterly when his mother goes away, but if he does not notice her going away, the emotional response does not take place.

Vygotsky analyzed other age groups in a similar fashion: the elementary-school age, when memory undergoes its most intense development and hence begins to assume a dominant position in the structure of the child's consciousness, and adolescence (the transitional period), when thinking begins to take place in concepts, giving rise to a conceptual system.

Of course, this theory about the age-linked developmental features of child development was not completed by Vygotsky, nor was it worked out in sufficiently concrete and elaborated form; but an analysis of the empirical data of psychology from this perspective enabled him to formulate a number of postulates of paramount importance for the further development of this problem and for psychology as a whole.

First, Vygotsky postulated the need for a systemic approach to the characterization of the developmental features of a child's consciousness. "Consciousness does not consist of the sum of all its functions; on the contrary, each function develops according to the development of consciousness as a whole." But as each function is differentiated and acquires its own discrete form in the course of a child's development, all the interfunctional connections and relationships, i.e., the entire system of

a child's consciousness and its activity, undergo a restructuring as well.

Studies have shown that initially (in infancy) consciousness is global, diffuse, and undifferentiated. Later the function of perception begins to take shape within consciousness, though it still remains undifferentiated, and all the other elementary functions begin to operate with reference to it and through it. Thus, somewhere between infancy and early childhood a system of consciousness specific to this particular age appears for the first time.

Next, as we have said above, all the other mental functions begin successively to assume discrete and differentiated form, in each case undergoing a restructuring (rearrangement) of their interrelationships, i.e., a new system of consciousness, again specific to the particular age, is formed.

In the light of these considerations Vygotsky formulated one of the most important laws of development of a child's consciousness: that a mental function, assuming a discrete form and becoming differentiated within the age period specific to it, also assumes the central and dominant position within the overall system of a child's consciousness, defining and guiding, in some measure or other, the activity of all the other mental functions and hence the structure and activity of consciousness as a whole. "Consciousness has a hierarchical structure. It is not built up as a set of democratically organized, discrete functions that operate on a completely equal and independent basis, side by side; the very idea of differentiation in mental development implies that some form of complicated hierarchy and organization is involved." (3)

We should point out that the process of differentiation of functions and, accordingly, the sequence in which they come to dominate consciousness are by no means a chance phenomenon; this process, too, follows a definite pattern: first, a mental function develops, providing the necessary groundwork for the development of the next function. Thus, thinking becomes the dominant function and its higher conceptual forms take shape; it is also the most complete structure of consciousness, the

highest stage of its hierarchical organization.

Vygotsky also applied the concept of the systemic structure of consciousness in investigating individual characteristics of adults. He thought that in terms of differential psychology, one individual differed from another not so much in that the memory of one might be better than the memory of another, but in that their power of attention and the force of their drives differed. In comparing individuals, it is not the primary or even the secondary relationships within the integral system of consciousness that are important, but rather the relationships that exist on some third level and the way the individual himself makes use of his own capacities, i.e., the place they occupy in his personality and activity. (4)

Vygotsky's clinical studies played a major role, at this time, in the development of the basic postulates and hypotheses of his theory.

In his analysis of the psychological changes that took place in a patient with aphasia, schizophrenia, Parkinson's disease, etc., Vygotsky not only found a confirmation of his ideas concerning the mediated nature of the structure of man's higher mental functions but even was able to pinpoint general patterns characterizing a human being, his consciousness, and his personality as a complex, integral system arising on the foundations of second and third levels of interfunctional relationships.

Vygotsky showed that different, higher mental functions and their systems, including speech (the higher forms of memory, attention, voluntary behavior, etc.), broke down depending on which speech function was disordered in patients with secondary aphasia.

He summed up the results of his findings as follows: All the higher mental functions are built up according to the laws of man's cultural and historical development. They emerge in the process of the child's social interaction with others and operate in accordance with the laws governing the assimilation of social forms of behavior by the individual.

In the process of development, mental functions are mediated and transformed into qualitatively new psychological structures.

This brings about a transformation in the inner structure of consciousness seen as a whole and in the relationships among individual functions and in the different kinds of activities on the basis of which new dynamic systems are formed for integrating the numerous types and elements of human mental activity.

Consciousness always operates as a complex hierarchical system, the highest form of which is a hierarchy at the top of which stands conceptual thinking. The outcome of this development is that the child becomes a conscious being, capable of controlling his own behavior. Thus, at this stage in Vygotsky's research, the development of generalized thinking and thinking in concepts was seen as the central process determining the development of the human mind, man's consciousness, and his personality.

II

The next stage in the development of Vygotsky's scientific thought does not exist — at any rate it was never completed and expressed in print. But an analysis of some of his statements and archive materials, some of which were published posthumously, enables us to infer how this stage would look [6, 7].

Vygotsky himself was apparently not satisfied with the intellectualism implicit in the theory of consciousness and personality that capped the second stage of his investigations and was troubled by the fact that the postulates at which he arrived from his study of cognitive mental processes were not a sufficient basis for an analysis of the higher systemic structures that determine the human personality. Hence, he devoted the entire last period of his life to a theoretical development of the problem of affect, its relationship to intellectual processes and to the problem of the transition from elementary emotions to the higher feelings characteristic of man.

In addition, in his analysis of the findings of clinical and child psychology he found himself more and more posing and

trying to solve questions concerning the role of affect in the development and disintegration of psychological systems.

Vygotsky's interest in the problems of man's affective life was also spurred by the difficulties he encountered in his research, particularly in trying to analyze clinical findings obtained on normal people.

For example, in his essay on "psychological systems" Vygotsky analyzed the abnormal psychological symptoms accompanying schizophrenia and raised the question: Why is it that these patients, who display no gross impairments of any functions, have a totally confused consciousness, peculiar behavior, etc., i.e., disorders of mind and consciousness that go far beyond anything that might be observed in aphasics?

The key to understanding this, from his point of view, lay in the emergence of specific systemic structures during the process of individual development; the disintegration of these systems would inevitably bring about the disintegration of the personality as well. The psychological nature of these specific systems was not elucidated in this essay, however.

To be sure, Vygotsky traced out schematically the pathological process that he thought was at work here: alienation from the social environment and the appearance of autism (a central symptom of schizophrenia), which also alters the patient's relationship to himself, since this relationship (like all other new structures) is the outcome of internalization of the forms of individual communication and contact with others.

Of course, this explanation is still too general and sheds no light on the psychological content of the new structure which determines a person's relationship to himself and effects a unity between consciousness and personality, and whose disintegration produces the schizophrenic syndrome.

But it was not only an analysis of schizophrenia that revealed the limitations of an approach that did not take into account the development of a person's affective life and needs. This limitation showed up each time an attempt was made to shed light on the more complex new structures associated with the formation of the personality. In these cases Vygotsky

turned again to concepts referring to human needs and affect: he spoke of experience as a unity, whose study would enable us to understand the interrelationships between the child's personality and his immediate environment. He says that at the top of the hierarchy of consciousness in young children is affective perception. He poses the problem of the conflict between affect and intelligence; and the emergence of voluntary control over the higher mental functions remains one of the central points in his theory. But no matter how thoroughly and concretely Vygotsky discusses and describes the cognitive structures of consciousness, his reference to the higher (sometimes third-level) systems characterizing the personality remain general and ill defined. There is, indeed, nothing surprising in this since during his lifetime concrete empirical research was confined to the development of cognitive processes.

We may conclude from the foregoing that to continue research following Vygotsky's line of reasoning would first of all entail making empirical studies of the development of human affect and needs in the light of his theory of the development of the higher mental functions and their systems and analyzing the new psychological structures emerging in the process of this development. This should be an asset in furthering the cultural-historical theory of the human mind and should ultimately provide us with insights into the nature of personality.

We may also conclude from what we have said that the development of man's affective life and needs is basically governed by the same laws as the development of his cognitive functions: they are mediated by socially acquired experience, enter into complex relationships with other functions, and together with the latter form new psychological structures. Furthermore, it may be assumed that affective processes are necessary constituents in the development of cognitive structures as well, without which the study of the human personality would remain one-sided, to say the least.

Systematic research (in the spirit of Vygotsky's ideas) into the development of the child's personality, on the assumption that the development of affective life and needs was key to it,

has been in progress for quite some time (since 1946).

These studies not only are based on Vygotsky's theoretical views but also attempt to maintain a consistent methodological approach: complex psychological structures are not dissected into elements or units, but are regarded in terms of their functional relationship to the individual personality of the child. Empirical studies are widely employed, observing these conditions [1, 2, 3, 9, 10].

In the light of these studies it has been found that as the child develops, his needs and drives are, in fact, mediated, and thus become part of the general cultural and historical development of the human mind.

The empirical findings accumulated in these studies indicate that when a need cannot be directly satisfied, it is mediated by consciously posited goals, deliberate decisions, and intentions to be realized, as a result of which unmediated, impulsive behavior becomes voluntary. Consequently, we may say that the goals posited by the individual himself, the decisions he makes, and the intentions he formulates (all of which guide the subject's behavior and activity, with the energy derived from the needs they mediate) are the higher new functional structures, which emerge in the course of the ontogenetic development of an individual's affects and needs and which become for him specific drives determining his behavior.

The development of affects and needs also gives rise to the psychological system constituting the human will, i.e., man's capacity to organize his motivational sphere in such a way as to ensure that the motives that guide his behavior toward his own consciously posed goals maintain a dominant position [2].

Finally, individual development also sees the emergence of new structures (fusions of motive with modes of behavior) that in psychology are referred to as qualities of character (e.g., responsibility, meticulousness, organization, etc.). Once these new structures appear, they begin to serve as motives in their own right. An analysis of the inner organization of all new structures emerging in the process of individual development has shown that in psychological terms they amount to a fusion

of affective and cognitive components, which, in fact, serves as the guarantee of their motivational force. Consequently, when a goal is posited (or an intention is stated) in a purely rational way, i.e., when affect and reason do not meet head on in this process, the required new functional structure does not emerge, and consciousness does not acquire any motivational force.

So we see that even in the sphere of affect and needs, a person's behavior does not reflect elementary (natural) needs and drives, but new, mediated structures of these needs and drives.

Vygotsky's thoughts were apparently also moving in this direction when he seconded Lenin in the idea that only man is able to formulate intentions, observing that it was this capacity that distinguished civilized man from primitive man and from a child, and that it "distinguished man from animals to a much greater degree than did his highly developed intelligence" [6. P. 455] (my emphasis -- L. B.).

The development of emotions is very closely related to the development of needs. In some sense each is but one side of the same process, the process of development of the sphere of affect and needs.

Initially the experience of comfort (or discomfort) occurs as a particular form of reflection of the degree of satisfaction of some need of the individual; the associated emotions orient the individual in his relations to his immediate environment, impelling him to be active and thus serving as an elementary mechanism of self-regulation.

This experience, however, will vary in its structure and content as a function of the object that satisfies the need (whether direct or mediated). Thus emotions begin their path of cultural and historical development. This process, like any other process of development, involves the following: elementary emotions undergo a qualitative change and are transformed into complicated, specifically human feelings: moral, esthetic, intellectual, etc.

Vygotsky also foresaw this path of development of emotions. In criticizing the naturalist theory of emotions he reproached

its advocates for remaining blind to the fact that in the course of a person's life, his feelings are constantly displaying new qualities, and that these new qualities are essential; they occur abruptly, and can by no means be understood as simply the further development of more elementary forms [7].

Hence, in this area, too, Vygotsky perceived the same law of transformation of elementary (natural) mental processes into new functional structures, whose content and organization depended on the social experience they mediated. Love between a particular man and woman, for example, is different not only from the sexual drive of animals but also from the love of people living in other historical periods and from the love of people having a different individual experience. (This is why Stendahl described various forms of this feeling, each of which differed from the others in the components it embraced and in the specific content of each of these components: love-ambition, love-habit, love and the sense of property, etc.).

A study of the development of man's emotional life is still in its beginnings. But even in these early stages we already have evidence that the experience a person has during the course, and as a result, of satisfying a need may assume, for him, a value in its own right and thus itself become the object of a need. This is fraught with consequences: first, a need can become insatiable, which would make its development a process without end; second, new needs (I do not want to eat, but I want an orange), often in direct contradiction to the primary need on whose basis the new need arose, may appear; and finally, and most important, the function of experience and its place in the overall structure of the individual's personality change.

Subjective experiences and feelings become the focal point of a person's inner life and its principal content. And whereas elementary emotions may once have served as goals for the individual's self-regulation at the natural (zoological, to use Vygotsky's term) level, man's feelings, especially his moral sentiments, become the foundation for the individual's self-regulation.

Studies in the spirit of Vygotsky's theory of the development of man's affective life and needs will therefore bring us closer to solving the problem of the conflict between affect and reason and hence to an understanding of the individual personality as a higher systemic structure.

Consistent application of the notion of system in psychological analyses, based on empirical findings, not on abstract reasoning, was not only one of the hallmarks of Vygotsky's creative thought but also a principle of scientific inquiry he consciously embraced. "Premature theorizing," he said in his talk of October 2, 1930, "is wrong, in my opinion." Perhaps it is because of the consistent application of this principle that Vygotsky's scientific work always impresses us with the profundity with which he penetrates into and explains real mental phenomena such as we encounter in the experiences of everyday life. This is why his work has always served and will continue to serve us in our practical efforts to deal with the problems of education and upbringing and the problems of defectology, medicine, and art.

Notes

- 1) L. S. Vygotsky [Pedology of the adolescent]. Moscow-Leningrad: Uzhpedgiz, 1931. P. 471 (Private archive).
- 2) A talk that, unfortunately, was never published, presented to a circle of his closest co-workers. The subject was "Psychological systems."
- 3) L. S. Vygotsky [Foundations of pedology. Notes from talks given at the 2nd MGPI]. Moscow, 1934. P. 111.
- 4) L. S. Vygotsky [Talk on psychological systems, notes]. 1930.

References

1. Bozhovich, L. I. [The personality and its formation in childhood]. Moscow, 1968.
2. Bozhovich, L. I., Slavina, L. S., & Endovitskaya, T. V.

- [Empirical study of voluntary behavior]. Vop. Psikhol., 1976, No. 4.
3. Bozhovich, L. I., & Blagonadezhinnaya, L. V. (Eds.) [Problems in the psychology of the personality in school age]. Moscow, 1961.
4. Vygotsky, L. S. [Selected psychological studies]. Moscow, 1956.
5. Vygotsky, L. S. [Problems of the emotions]. Vop. Psikhol., 1958, No. 3.
6. Vygotsky, L. S. [Development of higher mental functions]. Moscow, 1960.
7. Vygotsky, L. S. [Spinoza and his theory of emotions in the light of modern psychoneurology]. Vop. Filosof., 1970, No. 6.
8. Leont'ev, A. N. [The development of memory]. Moscow, 1931.
9. Bozhovich, L. I., & Blagonadezhinnaya, L. V. (Eds.) [Motivation of behavior in childhood and adolescence]. Moscow, 1972.
10. Slavina, L. S. [Children and affective behavior]. Moscow, 1966.

L. I. Bozhovich

SOME PSYCHOLOGICAL ASPECTS OF SCHOOL READINESS

A child's life and the development of his personality take an abrupt turn when he enters school. The preschool period ends and the school-age period begins when he assumes the tasks of systematic school study.

His new situation, compared with that of the preschooler, and the new activity that now constitutes the main content of his life make new demands on the child.

School means an entire restructuring of the child's life; he enters into new relations, faces new tasks and new problems, and begins a completely new kind of activity: study.

During the preschool period, a child acquires new knowledge in a radically different way from that he learns in school. For the preschooler, learning is basically not a problem, subjectively. But for the child in school, learning becomes an activity that is an end in itself, i.e., the acquisition of knowledge. The break or differentiation between play and learning is now complete and final, and learning now becomes work, i.e., study, a voluntarily organized activity with the goal of achieving a socially significant result.

A child's learning in school, his school performance, is now subject to social evaluation; and this evaluation begins to deter-

From Voprosy psikhologii rebenka doshkol'novo vozrasta [Problems in the psychology of the preschool child]. Moscow-Leningrad: APN RSFSR, 1948. Pp. 122-31.

mine the relation of others to the child, i.e., his social position. He may be a top student, read better than anyone else, or, on the other hand, he may be on the brink of failing.

Thus, when a child enters school his life acquires a new content. He is now called a Soviet pupil, which means that though still a child, he henceforth has certain obligations to society, and he is responsible for meeting those obligations. The schoolchild is obliged to learn to read well, he must observe school rules, and he must behave in accordance with the requirements, traditions, and views of the school collective.

But in addition to these obligations, the schoolchild also acquires new rights. He can now demand that others take his schoolwork seriously and regard it as a socially significant activity. He also has the right to demand others to respect his obligations, that he be given a place to work; he may demand that others not disturb him as he prepares his lessons; and he begins to enjoy a greater independence and self-sufficiency.

If the school beginner has difficulty in learning how to behave as a schoolchild, if he does not fully grasp his new obligations, we say that that child is not fully ready for school. To do schoolwork a child must have already reached a certain level of mental development during the preschool period, before entering school. But this level is not reached automatically: it must be fostered and cultivated during the preschool period. This is why the problem of school readiness is much more than a theoretical problem; it is fraught with direct practical significance.

Bourgeois psychology at the beginning of this century considered the principal criterion of school readiness to be the store of knowledge and ideas the child brought with him when he entered school. The breadth and scope of his ideas — or, to use a term of bourgeois authors, his intellectual inventory — were the child's ticket to school, the assurance of success in the acquisition of systematic knowledge.

This view gave rise to a plethora of studies to determine the "store of ideas" of children entering school and to work out specifications and requirements a child must meet in this re-

gard. The research of Soviet psychologists and practical experience in schoolwork have shown, however, that no such direct correlation exists between this store of ideas and the general level of a child's psychological development as to determine school readiness. A child may have a good knowledge about a number of things, a quite broad intellectual inventory, but still be incapable of coping with the demands placed on him by school.

Intellectually, school readiness is determined by more than the child's store of ideas; the level of development of generalized thinking, i.e., the qualitative aspects of thought, is also involved. In this respect, school readiness means above all a readiness to learn the particular material taught in school, i.e., arithmetic, Russian, science, history, etc.; and this requires that the child be able to differentiate and generalize about the objects and phenomena of the world around him, which means finding concepts for them. Science is such a subject matter. It is presented to the child in a form he can understand, in such a way that out of the complex whole of phenomena and objects in the world about him, those aspects the child is able to comprehend are singled out and presented to him as something to learn. The preschool child is often still unable to discriminate phenomena in the outside world to the degree necessary for learning material offered in school.

In our studies on the psychology of learning language, for example, we discovered that the main difficulty in teaching grammar was that for a long time a child was simply not conscious of language as a special system. To learn grammar the schoolchild must first of all recognize language as a discrete phenomenon, which he can then study.

The level of development of a child's thinking is not, however, the only standard relevant to the demands placed on a child by the school; the development of other psychological processes must also meet certain requirements.

In contrast to the preschooler, the schoolchild must learn a system of knowledge. For example, the foundations of science require a specific learning program, and this program is

worked out in accordance with the requirements of the science itself. Thus, the child must follow a definite program as he learns, and can no longer follow along the path his interests, desires, and needs take him. This extremely important requirement, that programmatic material be learned according to a system, means, of course, that the learning process must be consciously and deliberately organized. To take in and digest school material, a child must be able to set himself a goal and then organize his activity in accordance with that goal.

Under the direction of A. N. Leont'ev, a number of studies have been conducted to demonstrate the psychological aspects of the conscious organization of memory, perception, thinking, etc., and under what conditions the psychological prerequisites of school learning are formed during the preschool period.

Neither the level of development of a child's thought nor his ability to control his own mental processes exhausts all aspects of the problem of school readiness, however. In fact, together they make up only one side of the question.

When he enters school a child should be ready not only for learning things in a particular way but also for a new lifestyle, new relations toward others, and a new attitude toward his own activity. Indeed, of what advantage is it if a child can read and write yet be so personally unprepared that he cannot adjust properly to his school obligations, does his lessons carelessly, and cannot establish the right relations with the teacher?

This aspect of school readiness, i.e., a personal readiness, reflected in the child's attitude toward the teacher, toward study, toward school, and indeed toward an activity with social significance has been relatively neglected in psychology. It is this problem I should like to address, and in doing so I shall draw on my own studies and those of my colleagues.

Any kindergarten teacher or parent knows quite well that at the age of 6 or 7 years children begin to dream about school and are eager to begin systematic school study. As this desire to go to school and learn takes shape, the behavior of kindergarten children distinctly begins to change. Inside, they

are no longer satisfied with the position of a preschooler, and their interest in the activities of the preschooler wanes. They begin to want to be more responsible members of the collective and to be given responsible things to do by adults. Some children even begin to rebel against a situation in which not long before they had willingly participated. This was especially evident when school began at 8 years. Even the strong ties a child has to his kindergarten are not enough to keep the older preschoolers from wanting to leave the kindergarten to go on to school. But where does this desire come from, what are the factors involved in it, and what is it aiming toward? Some bourgeois psychologists think that man by nature desires to know, that it is an instinct that at a certain age stimulates the child's desire to learn. Of course, no Soviet psychologist today would claim that there is an instinctive desire to know. For us there can be no question that this desire must be cultivated in the child. But of what, exactly, does this desire consist, and how can it best be fostered?

One might suppose that the older preschooler's desire to learn is not so much a desire to learn as a desire to go to school. It is conceivable that a child simply wants to be part of a new group of children, to be in a new situation with new impressions, and to obtain the external prerogatives of the schoolchild. This view is also supported by the obvious attachment of the youngster to all the external attributes of the schoolchild, status, etc., and the clear desire of older schoolchildren to show off before the younger children in their new role.

The evidence from our studies shows, however, that this view is at least one-sided, and hence incorrect.

We talked with some preschoolers, observed them, set up special experiments with them, and found that the older preschoolers do indeed want to learn, and that going to school is merely a way to reach their goal. To demonstrate this position let us present some of our experimental findings.

We played school with some preschoolers. We varied the game and played it with children of different age groups, which

allowed us to follow the dynamics of how children developed their attitude toward school and to single out some of the more important aspects of this process. We selected this approach on the basis of the following considerations.

We know that the play of preschoolers is always focused on what, for them, is the most important and essential in the events they are enacting, i.e., on the content that is most meaningful to them; moreover, these most important, meaningful aspects are enacted by the children very elaborately and realistically. On the other hand, those aspects of the imaginary situation which are of secondary and minor importance are portrayed succinctly, dully, and sometimes even perfunctorily.

Thus, for example, children in a kindergarten often focus their attention on the preparation of lunch, on building a stove or a sink; and once they have prepared the food, they forget to serve it to the other children immediately or, if they do serve it, do so only in a formal, perfunctory manner. On the other hand, older children spend as little time as possible in preparing the food, but then enact the entire ritual of seating the children, feeding them, etc., down to the smallest detail, with all the nuances of personal interactions.

We were therefore correct in expecting to discover in the experimental play school what it is that really attracts the children to school life and to study. First, we found that it was very difficult to play school with 4-5-year-old children. They were not interested in this game at all.

"Let's play school," says the experimenter.

"Okay," reply the children, obviously out of politeness — and then continue what they are doing.

"You will play the pupils, okay?"

"I don't want to go to school. I want to play in the kindergarten."

"Who wants to play school?"

Silence.

"I'll be the daughter."

"Good. You will go to school."

"But I don't want to go to school. I'll play dolls."

"And I'll stay home." — etc.

If, finally, the experimenter succeeds in getting the youngsters to play school, it will go as follows: Going to school and coming home will occupy the central place in the game. The school lessons will last maybe a few minutes, marked off by a bell. But the most important part of school will be the recess. During recess the children run about, play, and make up new games having nothing to do with school.

Coming home from school one little girl said with relief, "Now I'll make lunch"; and when it was again time to go to school, Borya (4½ years old) suddenly declared, "It's Sunday already. We don't have to go to school. We'll take a walk. Oh, what snow! I'll go get my hat." — etc.

The way 6- and 7-year-olds played school was completely different. They quickly and eagerly took up the suggestion.

Experimenter: "Do you want to play school?"

Children (affably): "Yes" — and they immediately set about making up the classroom. They arranged the seats and desks, asked for paper and pencils (which had to be real), and improvised a blackboard. All wanted to be pupils, and hence the role of the teacher was usually dumped on the smallest or most timid child in the group.

The lesson occupied the main place in the game, and was played in a typical manner: the children drew lines and wrote numbers. They ignored the "recess bell"; when it rang, many children said, "It's not time for the bell yet; we haven't finished studying yet." In the interlude "at home," they prepared their lessons. Everything that was unrelated to school and study was cut short and reduced to a minimum. Thus, one little boy (Vasya, 6½ years old), who played the teacher, did not even leave his chair during the break, and played out his part verbally: "Now I've gone home; now I've come back; now I've eaten. Now let's get back to work!"

Playing school was quite interesting when children of different ages participated in it. It became clear that the meaningful part of the game was on completely different levels for the younger and the older children. For the younger children it

was all aspects of school life that were extrinsic to actual study, whereas for the older children it was studying itself, the lessons, which were most important. The children even had conflicts and arguments on this account. For instance, one little girl took a chair to build a house, and another took the chair back to set up the classroom, etc.

Our experiments definitely convinced us that although children are very much attracted to the external attributes of school life and study — rank, marks, the bell, etc. — what is central to their desire to go to school is not these things, but study itself, learning in school. If, on the other hand, a child is drawn to school because of these attributes and new impressions, he is still not ready for school.

Does this mean that preschoolers want to learn for learning's own sake, i.e., to become literate, educated people? The facts show that even 7-year-olds who are already in school are still not very concerned about the results of their school efforts. What is important for them is "trying" to learn.

"Are you doing alright in school?" we asked a 7-year-old first-grader.

"I'm doing well."

"How can you say you're doing well when you write so poorly? Look at this."

"I can't do it any better," answers the girl; "but I'm doing well, and Mama says I try hard."

First-graders are ready to do with almost the same willingness everything the teacher assigns them, quite independently of whether they see any practical use in it, whether they can get any concrete information out of it, etc.

If a teacher gives them something to do in the form of an exercise, the children are quite satisfied. But many children get angry and do not at all like to do something that does not look real from the point of view of a typical preschool activity, e.g., drawing, physical education games; and they are especially irritated when they are given an assignment in the form "Draw anything you like."

"I don't like physical education," said one of our children.

"That's not school; it's just playing in white suits."

"I don't like it when the teacher reads to us," said another; "I want to read myself." — etc.

Finally, and most important. More than once we observed children who already knew how to read and write when they entered school. If the main purpose of the first grade is to gratify the children's desire to become literate, obviously children who can already read and write should be bored by the school assignments. Parents often express such apprehensions: "What will he do there? He'll be so bored in school." Things are quite different, however. Literate children are just as eager as those who cannot read and write to do in school (i.e., under completely new conditions), with new motives, what they have already learned to do in kindergarten or at home. Thus, the most important thing for younger schoolchildren is to do their schoolwork conscientiously and be judged for their efforts by adults — father, mother, and, above all, the teacher.

This explains the extraordinary importance attached to grades by children. Preschoolers already dream about how they will get grades when they go to school, and younger schoolchildren are willing to forgo almost anything, but not grades, for their work. When a teacher simply puts a check mark in a youngster's notebook instead of a grade, he gets extremely annoyed. "Check marks all the time," said one little boy; "but when do I get a grade?" "I don't like this check mark; it would have been better to put a '2,'" said another.

We may conclude from our findings that older preschool children are drawn to school mainly by the schoolwork, not so much as a means of acquiring knowledge, but as a serious, socially significant, and socially evaluated activity.

In play, in practical activity, in the course of the entire pre-school period if it is properly organized, the preschooler acquires the habits and skills and achieves the level of physical and intellectual development that prepare him for an activity that goes beyond the bounds of preschool life. He begins to seek a new social position, a new place in life. In our system of universal compulsory education, in which the vocation of a

school pupil is an honor for every child who has reached a specified age, this desire is manifested among preschoolers as a desire to learn, to become a pupil.

A child wants to learn not from instinct, not because of new impressions, not even because of the external position of the schoolchild: he wants to learn because he sees learning as a significant, obligatory, serious activity, a job, which is important not only for himself but also for the adults around him. This does not mean, of course, that a 6- or 7-year-old is himself conscious of this desire, but essentially it is as described.

Does a child acquire this desire to learn under all conditions, regardless of the training he receives in the preschool period? We have good grounds for answering no to this question. There are always some cases in which a child comes to school from the kindergarten but is not ready for school. A good example of this was a 7-year-old boy who had just begun school. This child had been eager to go to school and was full of thoughts about it. But with what did he occupy himself most in school? First, he "sat at his desk" — according to his own words — all day long. He did not want to join in the class break because he did not want to leave his desk, which he opened and closed and fooled around with endlessly. He liked the teacher and what she wore, and like it "when they poured out the blue ink." When he had to stay after school because of bad conduct, he was quite happy, because then "he had the whole classroom to himself" and "could sit at any desk he wanted." He noticed his grade, but was completely indifferent to why it was given to him. Once, coming home, he said proudly to his mother, "Today I got two grades, a 5 and a 3." It turned out that the teacher had given him a 3 for having a messy notebook, and the 5 had been given by his desk neighbor as acknowledgment of his artistic talents. He had a totally inappropriate attitude toward his homework; he did it perfunctorily, carelessly, and sometimes began to draw in his Russian notebook; and when he became bored with this, he would resume his lesson.

Such children, who have not yet developed sufficient school readiness, still display a preschool attitude toward everything

having to do with school and learning. They play with their lessons and see the teacher merely as a nice lady (or not so nice lady). They cannot comprehend the requirements of collective schoolwork and hence often bother others and make things difficult for themselves. How may a proper attitude toward school and learning be cultivated in the preschooler?

First, he must be taught what we call the social reasons for learning. This means that the preschooler must understand and sense the important and honored place of the schoolchildren in our country. For this the government is there to assist the kindergarten teacher and parent. The radio and books are always discussing our schools and the importance of education in a way children can understand, and thus perform an important educative function without children's or adults' being aware of it. Meetings with schoolchildren, conversations with adults, etc., fulfill the same role, since, willy-nilly, they are the conveyers of the attitude toward school and education represented in public opinion in our country.

Of no less importance in developing a child's psychological readiness for school is the cultivation of the right attitude toward schoolwork itself. Not only should a desire to learn be fostered in the child as a socially important activity but he must also be taught how to derive satisfaction from his efforts and their results. One can find some first-graders who are unable to apply themselves and who derive no satisfaction from overcoming difficulties and trying hard. Children should be taught to be attentive to the results of what they do while they are still in kindergarten; they should be taught how to achieve this result, and to appreciate the effort required to achieve it. Hence, the older preschooler should have regular tasks to perform for whose results he is responsible.

Our findings have shown that children who have had certain duties and responsibilities in their families before they go to school learn more quickly to organize their work in school. They do not shirk effort: on the contrary, their schoolwork itself and the following period of recreation are important incentives to learning. In conclusion, we should

discuss briefly the age at which schooling begins.

By the time children reach the age of 7, most have already developed psychological attributes that determine their general school readiness. But it is also important that they should have acquired an inner desire to participate in a socially important activity, which is valued by society for its objective results. This desire should find gratification in school life. Otherwise, especially if his upbringing has been incorrect and neglected giving him any sort of responsibilities and obligations, this desire may give rise to certain adverse displays if it is not fully and duly met in school. Hence, from the psychological viewpoint, the lowering of the school-entering age from 8 to 7 years was correct. It should only be underscored that this necessitates that more attention be paid to cultivating those personality traits we have described during the preschool period.

Thus, a child's psychological readiness for school also implies that various aspects of his personality should have reached a certain level of development. For a child to do well in school, adjust to school life, and successfully perform all the duties and obligations of a Soviet schoolchild, he must not only have reached a certain level of intellectual development and have a certain store of ideas but must also have acquired some personal direction and have developed those character traits and willpower that will enable him to do schoolwork dutifully and properly. In this sense, school readiness can be fostered only if all aspects of the preschooler's life and activities are properly organized.

Ya. Z. Neverovich

THE DEVELOPMENT OF MOTOR ACTS WITH OBJECTS IN THE PRESCHOOL CHILD

Through the influence of his educative environment, the preschool child gradually learns to subjugate his actions to voluntary control. When the child has developed so far that he is able (at least partially) consciously to subordinate his actions to a specific goal, we can say that he has made an important step toward consciously assimilating the knowledge and complex skills he learns in school.

The preschool period plays an important role in the development of a child's motor activity, since the more complicated motor acts employed in schoolwork and in productive labor necessarily require that a child must already have learned to subordinate the functioning of his motor apparatus to the voluntary performance of some motor tasks, that is, that he be able to perform motor acts as a conscious goal.

The most outstanding authorities in physical education, for example, Lesgaft, stress the need to teach a child how to relate to motor tasks consciously and to be able to analyze and voluntarily control his own movements. There are a number of questions concerning the development of deliberate movements that require further study.

For example, it is still unclear under what conditions the transition from involuntary to deliberate movements occurs.

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Pp. 113-21.

two sand-filled dolls, two wooden globes, a wooden pot and kettle, a wooden samovar, and a bear carved out of plywood. As a means of conveyance we included a box lid, 22 cm × 32 cm, covered with plain-colored paper and with low wooden sides. All the articles easily fit on the lid. The child had to carry the articles over a distance of about 5 meters.

It is the principles on which the test was based that we consider important rather than these particular details, which are, of course, far from perfect and which will probably require considerable modification.

What the test basically tells us is not that the subject was or was not able to cope with a particular problem, or the simple effect of a properly chosen action, but the way the child goes about achieving the solution. We know that a child's mental development is more than mere quantitative growth, an increasing functional refinement; it also, and even primarily, involves modifying the very techniques he employs in his activity as he gradually assimilates sociocultural experience. A particular operation may be fundamentally identical, in terms of efficiency, for a retarded child, a school-age child, and an adult; but the nature of the operation and the way it is carried out may differ tremendously. A feeble-minded child can learn to perform simple arithmetic operations, but he will do them in a totally different way from a normal child of the same age. More and more, as investigators are coming to understand the profound changes taking place in the structure of behavioral acts in the developing child, their interest is turning toward studying these changes in more detail; and an awareness of this need is beginning to make itself felt in the modern science of testing as well. Let us hope, then, that our test may serve as one more, albeit modest, step in this direction.

A. N. Leont'ev

THE DIALECTICAL METHOD IN THE PSYCHOLOGY OF MEMORY

The modern science of psychology grew out of the empirical psychology of the 19th century, construing itself as the complete negation of the latter. As such it contains two quite distinct basic tendencies: one away from the idealism of empirical psychology, the other away from its metaphysical mode of thought. These two tendencies are now a part of virtually all of progressive European psychology (1), and also reflect two problems posed by modern Russian psychology.

Quite naturally, modern Russian psychology began by focusing its attention on the first task: delineating and consolidating its materialist position as an essential premise for its further development. The second task was temporarily relegated to the background. The most important questions for materialist psychology are undoubtedly those of basic methodology: materialism and dialectics constitute a unity from which dialectics and the dialectical method cannot be separated. Materialist psychology requires us to do more than incorporate dialectical materialism's basic tenets into fundamental psychological problems or exemplify dialectical principles of concrete psychological data: the dialectical method must become the method of

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psychological analysis. In this sense, contemporary psychology cannot rest content with simply interpreting its subject matter from the point of view of dialectical materialism while accommodating itself to the data of old empirical psychology; it must actually study its material by means of the dialectical method, which must play the central role, dominating other, more specific methods.

In materialist science, dialectic logic does not amount to just the formalistic imposition of its principles on any particular scientific discipline. It itself develops as scientific inquiry proceeds; it is the result of empirical science. Only if this is so can we really arrive at those "abstractions that embrace the full wealth of variability," i.e., at a theory that operates with dialectical concepts.

Since psychology is a borderline science that links phenomena originating in the various forms of movement of matter, the dialectical method is especially important in it; it is for this reason that it is in psychology that the profound contradiction between results obtained by way of each of the two different approaches, the dialectical and the metaphysical, may be most clearly observed. The classic psychological problem of memory is particularly well suited to demonstrate this point. Bergson, who declared it a problem with "privileged status," quite rightly saw how extremely important it was for shedding light on fundamental questions.

Classic empirical psychology* metaphysically viewed the objects it studied as finite, static structures accessible to direct investigation. This metaphysical way of thinking also showed up in the way it dealt with the problem of memory, which was customarily studied as some sort of absolute function. To see where this led, let us analyze the ways empirical psychology dealt with three distinct questions within the overall problem of memory. They all concern, in general, the dif-

*Leont'ev is here referring to introspective psychology of the sort developed by Wundt in Germany and Chelpanov in Russia. — Ed.

ferent forms of memory and their interrelations.

Positing different forms of memory as absolute and distinct entities existing side by side led empirical psychology to deal with them in two possible ways: either it attempted to reduce the higher forms of memory to lower forms, which actually meant denying the uniqueness of these higher forms or even ignoring their existence, or it constructed idealist concepts that explained these higher forms in terms of factors outside its immediate object of inquiry and did not emerge from the investigation itself.

"In essence, memory is a biological fact; whatever psychological aspects it has are only incidental. . . ." (2) "In terms of learning, retention, and recall, organic memory is wholly identical with psychological memory, the entire difference between them being that the former lacks consciousness." (3) This concept of the relationship between the simplest organic (physiological) forms of memory and its higher forms (psychological memory, as it is called) was further developed as their specific project by Russian reflexologists and American behaviorists. (4) But it met with serious objections from the point of view of human psychology, and by the same token has been justly criticized by biopsychology:

In equating the phenomena of "organic memory" (which could just as well be the memory of glands and muscles, or birches and mulberry bushes) with the phenomena we normally associate with the term memory, certain authors commit a palpable error fraught with implications: in using "memory" as a blanket term to describe the function of ganglia, neuromuscular habituation, or adaptation to electric shocks and protoplasmic memory manifested when single-cell organisms undergo excitation, these authors introduce boundless confusion into the question. And what makes this even more unfortunate is the fact that the phenomena of "organic memory" do not always display the features that distinguish the latter from memory in the psychological sense. (5)

On the other hand, psychology is replete with notions of different kinds of memory: "two memories, theoretically distinct and independent of each other": habit, or "repetitive memory"; and "imaginative memory," assumed to be a "spiritual intuition lying outside and independent of matter" (Bergson).

Both of these approaches to the problem must, at least in principle, lead to dualism. The sole difference between them is that in the first case, elementary physiological laws were declared sufficient to explain all kinds of memory in all their manifestations, with the result that the dualism was only potential, or took the form of agnosticism; in the second case, philosophical idealism declared open war on materialism and, by posing the question in such a metaphysical manner, was able to create a terrain highly favorable to itself for doing battle. In all fairness it must be said that mechanical materialism does not always come out on top in this contest. Because of its metaphysical underpinnings, mechanical materialist psychology was unable to perceive that if different forms of memory coexisted, they must be products of different qualitatively distinct levels of development in which, although the lower forms develop into the higher ones, the different levels cannot be mechanistically reduced one to the other, i.e., the higher forms cannot be reduced to the elementary, primary ones.

In his struggle against materialism Bergson quite consistently, and in our view correctly, observed, apropos of this question of the existence of distinct forms of memory irreducible one to the other: "The truth is that there is one, and only one, method of refuting materialism: it is to show that matter is precisely what it appears to be. Thus we eliminate all hidden power from matter, and establish the phenomena of spirit as an independent reality." (6) Bergson's statement effectively says that the most desirable form of materialism for an idealist is metaphysical materialism. The necessary premise for Bergson's idealism is that matter can possess only physical properties (7), for only on this condition is he able to demonstrate "the illusory nature of all attempts to deduce memory from the cerebral process" and to explain memory independently of matter.

Bergson confronted psychology with the problem of "two

memories." Contemporary materialist psychology's task is to solve it: not metaphysically, by negating the higher forms of memory through mechanically reducing them to an elementary property of organic matter (plasticity, or hysteresis, which is an even more general property of all matter), but dialectically, by analyzing how memory develops and how its lower forms are transformed into higher ones. It goes without saying, however, that no solution is possible without first settling positively the basic epistemological question of psychology: whether or not we can "stand apart from what we experience, not as intellectually active individuals, but as simple observers" (8), i.e., Can we study psychological phenomena in the same way as phenomena that are external to us? A negative answer to this question definitely leads to Bergson's epistemology, which was an integral part of his theory.

There is a second problem in the psychology of memory, directly related to the view prevailing in psychology that memory is some absolute function or property. What in memory is specifically human?

Any science must not only study what phenomena have in common, what makes them resemble one another, but also what about them is specific and distinctive. This question of specificity is especially important in psychology, in which we are dealing with exactly the same psychological function in animals and humans, children and adults, and even among different individuals (differential psychology). In memory there are two levels to the problem of specificity: in each particular case, one form of memory will be the predominant one, and the question then becomes one of the interrelationship among the different forms and of the essential characteristics of each, and how the problem will be solved generally turns on this question. But there is also a second aspect of the problem, that of method, how to proceed in an inquiry; and this question must inevitably involve the broad, fundamental, methodological premises of the problem.

Although by measuring general body size we can find out the common characteristics in this dimension of some group of

animals, we cannot thus derive the specific features of a particular order — Edentata, for example. The theoretical foundations of modern biology lead it along a totally different path in its investigations, indeed the only path that can establish essential traits, which is the aim, after all, of the investigations. In this sense the theory and general method of any science wholly determine not only how the data at hand will be interpreted and evaluated but, above all, along what paths concrete inquiry will be pursued.

In this regard, the methods, now become classic, developed by empirical psychology for studying memory are quite typical. In its search for procedures that would enable it to discover the absolute laws of memory, empirical psychology turned to the laboratory investigation of meaningless material (Ebbinghaus, Müller). The remembering of meaningless syllables was seen as the activity that would unlock the door to the study of human memory. Is there some function manifested in this activity that is in any way typical of man? We should be inclined to say that not only is there nothing typical about it but that it is largely devoid of the significance for the psychology of memory that has been ascribed to it.

If there is anything of interest in the study of memory on the basis of remembering meaningless material, it is that despite all the efforts to study pure memory, despite even the creation of special equipment, sophisticated procedures, and the special mnemonic material that has been devised for this purpose (the latter even published in special manuals [9]), what actually has been studied in these cases has not been some abstract, "simple function," but complex human memory. That this is actually so is persuasively demonstrated by one of the latest memory studies (10) to appear, in which it is shown that even when meaningless material is remembered, adult subjects usually exhibit a genuinely human trait: they resort to the use of auxiliary devices to help them remember, i.e., they mediate the memory process and in so doing transform it into a complex activity.

Let us suppose, however, that with certain methods one could actually succeed in studying "pure memory" and see what gen-

eral propositions such a study would purportedly establish. "The greater the number of repetitions, the greater the number of correct recalls, given an equal time lapse between repetitions and recall": this is one of the propositions Müller & Pilzecker (11) (whose works must surely be acknowledged as classics in the psychology of memory) derived from their studies. We are not so interested in the general purport of this proposition, which we would be the last to deny. What interests us here is another question: What significance can such propositions have for the study of the distinctive features of human memory? Do they not merely reflect the general properties common to both human and animal memory, and does not this tendency to study what is general implicitly contain the claim that it is impossible, in principle, for empirical psychology to investigate scientifically what is specific to human memory, and hence the concrete and practical aspects of it?

"Psychology," observed Janet in one of his latest books, "has become supersaturated with studies of the role of repetition; they purport to investigate human memory and indeed do make efforts in this direction, but how negligible and limited these efforts have been! Only the raw child will rely on repetition alone to memorize: the intelligent adult has command of quite a number of other techniques for this purpose. . . ." (12) At first glance this limitation of classic studies of memory may seem merely to be the natural result of the narrowing down of the problem required by laboratory conditions. Actually, however, it is the direct consequence, as we have said, of the basic methodological premises at the heart of empirical psychology. By drawing parallels between "simple" phenomena that are analytically discrete within a particular group, empirical psychology lumped them all together, comparing them on the same level in terms of the direct relationships of identity, coordination, or coexistence, and in doing so deprived itself of the possibility of studying these phenomena in their natural interrelationships. Actually, when some phenomena are superimposed on others, they do not form a simple linear sequence, but come together in complex interrelationships vis-à-vis both the base

and the superstructure. The task of the investigator, therefore, is twofold: he must seek to determine the general cause of a phenomenon, that is, to study its base, and, second, he must study what is unique about the phenomenon, i.e., he must study its specific cause. The laws governing the base of a phenomenon are manifested in the special laws governing the phenomenon itself; the cause of the former is a partial cause of the phenomenon as a whole. A phenomenon itself is possible, however, only when some additional factor is operative (the specific cause of a phenomenon) whose elimination would alter nothing in the base of the phenomenon, but would remove what was specific about it. Thus, study of the laws governing the base of a phenomenon is still not study of the general laws of that phenomenon.

"The general laws of memory in man and the lower animals, e.g., mollusks, are identical." (13) A conclusion of this sort must inevitably follow from the findings of traditional psychology, since it is contained implicitly in the way its problems are formulated, postulating the replacement of one higher class of phenomena by phenomena of another order that constitute the premise and the foundation of the former yet are governed by laws that do not extend to them.

One can appreciate the full extent of the difference between the conclusions to which the methods of old empirical psychology led and those arrived at in the most recent studies by comparing the following two "laws of memory": "The longer the series to be remembered, the more time is required to study one item in the series" — so goes one of the postulates established by classic methods of studying memory (Ebbinghaus); and "The time required to memorize one item of a series (fixation factor) decreases with an increase in the length of the series." The latter proposition, which is directly contrary to the first, was derived from a study done with equal amounts of both meaningful and meaningless material (14), with the difference that the study was not concerned with abstract, "pure" memory and hence did not limit the subjects to meaningless behavior during the experiment in its pursuit of conditions

under which memory would essentially cease to be specifically human.

Empirical psychology organizes its experiments in such a way that the generalizations at which it arrives are shorn of concreteness by virtue of the metaphysical core of the general concepts it employs; and its "general" laws, with their abstract truth, are continually being overturned by the reality of events.

Elsewhere (15) we have had occasion to demonstrate by means of a particular example how memory studies conducted by traditional methods of empirical psychology on particular individuals sometimes produce results that are at variance with practical experience. This contradiction between the findings of a scientific investigation and the evidence afforded by living reality is something modern psychology will be able to overcome only if it studies those features of human memory that are conditioned by the sociohistorical development of man's psychological functions and in their operation refute the absolute laws that constitute their own foundations.

Until modern psychology bases its studies on the postulate that psychological functions change under the influence of human sociocultural experience, and until it begins to study the laws governing these changes, their role, and their significance — in other words, so long as it remains at the level of studying psychological functions as bounded, immutable structures susceptible only of quantitative change — it will not be able to discover empirically the truly specific laws of human behavior. Consequently, the ambition of reflexology to replace psychology would be quite justified, since the fundamental difference in their respective subject matters would be thus eliminated; and the concepts of soul, mental activity, etc., in short, all those notions that are the outcome of empirical psychology's metaphysical trend of thought, would not be able to provide it with much defense. In its search for the absolute laws of memory, empirical psychology could not go much farther, at least in principle, than its central propositions, which later were reconfirmed by the findings of reflexological studies of animals. "What Pavlov discovered without any recourse to introspection

at all was similar to what came out of scientifically constructed introspection." (16) There is no denying that this testifies to one of the genuine strengths of traditional psychological studies, irrespective of the method of introspection; but we also cannot fail to see how inadequate such studies are when called on to reveal the specific features of human memory.

What at the outset appeared as a problem of forms of memory in general we now see to be a question of the specific forms of human memory; thus, once again we are faced with the problem of scientifically resolving Bergson's problem of "two memories." But now there is a third question as well, one that is as inseparable from the general problem of memory posed by metaphysical psychology as the first two: namely, the relationship of memory to other psychological functions.

Empirical psychology in effect takes a dual position on this issue. As we have already tried to show, the exaggerated importance empirical psychology attached to abstract elementary memory functions forced it to seek the ultimate explanations for the uniqueness of human memory in factors that lay outside the actual function of memory but found their expression in it as a subordinate object.

For Wundt it was apperception that fulfilled this role; for Höfding it was the will:

Like Wundt, Höfding by no means views these categorical relationships as some secondary unconscious mental cause that accompanies the primary physiological and material cause. . . . Like Wundt, he also tries to go beyond passive mechanical, physiological, associational psychology by resorting to a psychology focusing on the activity of the will; yet he, too, fails to see that this purposeful activity of the will is the highest functional category, the summit of a categorical system; it is absolute, unconscious activity of the spirit, which, availing itself of physiological apparatuses as mechanical aids, relates to them as if it were something of a fundamentally different and higher order. (17)

On the other hand, empirical psychology — and this accounts for the dualism in its position — tried to solve the problem of the relationships among different psychological functions in isolation, inasmuch as it viewed them abstractly and, moreover, in large measure mechanistically, that is, as a problem of their "joint action," which was only stated (18), not explained. The extremely important question of the role of memory aids (auxiliary associations, *Hilfen*, *représentation auxiliaire*) was posed in exactly the same way; though their existence was described, this was of no help in working out general principles such as the principle of "higher functions supporting lower ones." (19)

The essentially metaphysical nature of even the concept of memory has in large measure helped to shape the theory of memory in empirical psychology. Viewing memory as an absolute function, as a substance, psychology in metaphysical fashion lumped together phenomena such as the tracks of cart-wheels on the ground, the predispositions of neurons, practice, fixation of an image, and the logical memory of cognition. This, in turn, gave the impetus for a particular approach to the study of human memory in which the primary objective was to find the general features of this function; in particular, it provided the rationale for introducing the method of nonsense syllables, which, as Titchener observed, "though they brought us back from logical meaning to the psychological fact, nonetheless served psychology in poor stead: research began to focus more on what took place in the nervous system than on conscious memory processes." (20) An even more important consequence, however, was that with the concept of memory expanded in this way, it, like any other metaphysical concept, became subject to the rule of formal logic that says that the more things a concept tries to include, the less content it has, and the less value it has as a means of knowledge. In fact, in his special monograph on the subject, Meumann concludes that "memory in general does not exist." (21) Once turned into an abstraction, metaphysically divested of all relation to the concrete, "memory" evaporates, and is transformed into "pure

nothingness." We should note that memory is not the only psychological concept to which this has happened: the concept of attention suffered the same fate. Such is the destiny of any concept that is metaphysically shorn of its concreteness and studied in its "ossified," static essence as a general concept.

Of course, such an overly broad concept as that of memory had to be taken apart analytically if one wished to study it. And it was at just this point that empirical psychology revealed its metaphysical core, destroying the unity of the discrete act of memory by dissecting it into arbitrarily defined processes such as impression, retention, recall, etc. No matter how provisional such a breakdown may be, it fundamentally violates a basic principle of modern psychology — the principle of the integrity of all the acts of individual behavior. This, in turn, gives rise to a number of factually untrue propositions, for example, that recollection is identical with the recurrence of an impression, which differs from the latter only quantitatively. Spencer's edict that "The recall of the color red is merely seeing it in fainter form" has traveled far; he applied it to a wide range of memory phenomena, and we encounter it among neo-associationists as well as among representatives of classic association psychology. A. Bain, who defines recollection in the same way, bases his further development of the concept on data from laboratory studies of perception — for him, identical with impression, which constitutes the initial event of an act of memory. (22) It is perfectly consistent in the genetic or developmental approach to liken the images of memory to "sequential images"; but when this is done within a system of arbitrary distinctions, it leads to results that fly in the face of the facts, as we see happening in Bain's psychology.

In criticizing the use of the concept of memory in empirical psychology, we must ask whether this concept still has a place among the concepts of modern psychology and whether it may be replaced by other concepts, e.g., the concept of "reproduction," which is the most frequently used substitute for memory. It is doubtful, however, whether the mere substitution of one term for another will in any way help to clarify whatever con-

tent they are meant to have, especially when the term "reproduction" is used side by side with the term "memory." We can obviously not expect the term "reproduction," when used in the sense of "or memory," i.e., when its use embraces the same multitude of diverse phenomena as "memory," to add anything new to our system of psychological concepts. Indeed, it is no more than the substitution of one word for another, and in this case is worse, because in its direct and precise meaning it does not actually even fit what it was meant to express. Actually, the key here is not to reject the term "memory," but to see the concept itself as a process, that is, to elaborate it dialectically.

Although we have said that pure empiricism does not hold up scientifically, we by no means wish to toss out the empirical method, the end result of which would be the fabrication of a priori constructs and their introduction into psychology. We wish only to make the observation that "An approach to knowledge that purports to take things as they are contradicts itself," since the empirically given is itself fraught with and shaped by theory; but this theory itself grows, in turn, from empirically given, objective facts. Thus, concrete experience is given to us twice, as it were: first, as unorganized, chaotic concreteness, from which we derive, in Marx's words, the first frail abstractions, and, second, experience as a concrete reality standing at the end of the cognitive process, which has organized it, reconstructed it, and filled it with its own content of a system of abstract concepts, i.e., theory. When we study facts, i.e., concrete reality, we extract from them those regulative, theoretical concepts that guide our perspective, and with these in hand, we resume our scrutiny of concrete reality, of the facts whose study will either confirm or refute but, most importantly, will develop, broaden, and deepen the content of these concepts.

It is not two separate processes that are at work here; they represent merely two sides of a single process of inquiry, a single cognitive process.

The theoretical position from which we proceed in our study of memory — and which, moreover, we believe follows neces-

sarily from the vast amount of factual material available to modern psychology — is Vygotsky's theory of cultural development (23), a theory that, to use Hegel's words, recognizes the "great cunning of the human mind," i.e., reflects the specifically human capacity to command natural phenomena, "forcing one set of natural forces to act against others," and extends this cunning to include man's behavior, which he acquires in the process of his own civilized, historical development.

Thus, we have two methodological approaches to the study of memory: the one studies the development of human memory by investigating and comparing its various forms, i.e., the various stages in its development. The second studies the process of development itself, i.e., the transition from one form to another, potentially contained in the preceding one, and the conditions enabling this transition, in which new properties are acquired, to take place.

So the general direction of inquiry that has emerged from the way empirical psychology has dealt with the problem of memory and from the basic methodological premises of modern scientific psychology has been from a developmental study of the different forms of memory and the process of transformation of one form into another to the study of their structural mechanisms and the analysis of human memory in terms of its development.

Rejection of the metaphysical style of thinking that dominates empirical psychology is an absolute prerequisite; it must be overcome if psychology is to develop further. But this does not mean that we should discard its genuine scientific achievements as well:

The old method of investigation and thought Hegel calls "metaphysical," which preferred to investigate things as given, as fixed and stable, a method the relics of which still strongly haunt people's minds, had a great deal of historical justification in its day. It was necessary first to examine things before it was possible to examine processes. One had first to know what a particular thing was before one could observe the changes

it was undergoing. . . . The old metaphysics . . . arose from a natural science that investigated dead and living things as finished objects . . . while natural science up to the end of the last century was predominantly a collecting science . . . in our century it is . . . a science of the processes, of the origin and development of these things and of the interconnection that binds all these natural processes into one great whole. (24)

Notes

1) The two forms assumed by these tendencies in the most recent world psychology are, on the one hand, an attempt to establish psychology as a positive science, and the marked spread of the ideas of behaviorism, and, on the other, the demand that psychology return to the concrete (Poltzer). The present year has seen the formation of an international literary society, [publisher of] Revue de Psychologie Concrète, which has drawn the participation of modern psychology's most prominent representatives: Poltzer (Paris), Giese (Stuttgart), Kantor (USA), Adler (Vienna), Myers (London), Prinzhorn (Frankfurt am Main), and others; they define their relationship to classic psychology as follows: "Amidst the regrets and vacillations of the majority of psychologists, the new psychology unequivocally takes as its starting point the most recent attempts to release psychology from the domination of the old school that has for so long provided the basis of official teaching." (Editorial, Revue de Psychologie Concrète, 1929, No. 1, p. 1.)

The second number of this journal, which appeared just as the present article was going to press, contains an even bolder declaration, in which its editors define their basic position as that of dialectical materialism as presented by Marx and Engels.

2) T. Ribot, Pamyat' v ee normal'nom i boleznennom sostoyanii [Normal and abnormal states of memory] (2nd ed.). P. 4.

3) Ibid., p. 12. Our emphasis — A. L.

4) See, for example, Bekhterev, Obshchie osnovy refleksio-

logii cheloveka [The general foundations of human reflexology], Ch. XXX; and Watson [John Broadus], Psikhologiya (Russian translation edited by Professor Protopopov). P. 286. [English edition, Psychology from the standpoint of a behaviorist, London, 1919.]

5) W. Wagner, Biologicheskie osnovaniya sravnitel'noi psikhologii [Biological bases of comparative psychology]. Vol. II, p. 288.

6) Henri Bergson, Materiya i pamyat' (translated by V. Bazarov). P. 64. [English edition, Matter and memory, London, 1912. P. 80.]

7) Ibid., p. 63 [English edition, p. 79].

8) G. Muensterberg, Osnovy psikhotehniki [The bases of psychotechnology]. Part I, p. 9.

9) See, for example, Materialy dlya eksperimental'nogo issledovaniya protsevvov pamyati. In Vypusk 1, Ryady bessmyslennykh slogov [Materials for the experimental investigation of memory processes, Part I, Series of meaningless syllables], compiled by V. M. Ekzemplarsky and issued by the Institute of Psychology.

10) Foucault, Sur la fixation des images. J. Psychol. (Paris), 1924.

11) Cited in Schoeneberger, Psychologie und Pädagogik des Gedächtnisses. Leipzig, 1911.

12) P. Janet, L'évolution de la mémoire et de la notion du temps. Paris, 1928. P. 260.

13) Dumas, Traité de psychologie. 1925. Vol. 11, p. 687.

14) Foucault, op. cit.

15) A. N. Leont'ev, Zapominanie u detei i t.d. [Recall among children, etc.]. Vop. Defektol., 1928, No. 4, p. 21.

16) A. P. Nechaev, Pamyat' cheloveka i ego vospitanie [Man's memory and his education]. GIZ, 1929. P. 110.

17) [G. W.] Hartman, Sovremennaya psikhologiya [Modern psychology]. Ch. 4, Assotsiatsiya i vosproizvedenie [Association and recall]. P. 126.

18) E. Meumann, citing the work of Goldstein & Ranshburg, writes: "During [processes of recollection — A. L.] we observe

the simultaneous action of: (1) concentration of attention — this is in all probability a general condition upon which both the success of an impression and the formation of associations, but (most of all) impression itself all depend; (2) the process of impression; (3) the formation of auxiliary associations — this mainly aids the apprehension of the content of our perceptions within the framework of our ideas and makes it possible to form associative relationships; (4) the impulse to observe and record (the impulse to observe, which should be distinguished from the impulse to record, as a specific aspect of the will)." E. Meumann, Ekonomiya i tekhnika pamyati. P. 78 [Russian edition]. [Ökonomie und Technik des Gedächtnisses: experimentelle Untersuchungen über des Merken und Behalten. Leipzig, 1920.]

19) E. Meumann, Lektsii po eksperimental'noi pedagogike. Vol. 1, p. 629. [Vorlesungen zur Einführung in die Experimentelle Pädagogik und ihre psychologischen Grundlagen. Leipzig and Berlin, 1914.]

20) W. Titchener, Uchebnik psikhologii. Moscow, 1925. Vol. 2, p. 104. [English edition, A primer of psychology. London, 1903.]

21) E. Meumann, Ekonomiya i tekhnika pamyati. P. 34 [Russian edition].

22) A. Bain, Les sens et l'intelligence. (3rd ed.) Paris, 1895. Pp. 257, 547.

23) L. S. Vygotsky, Pedologiya shkol'nogo vozrasta [The pedology of school age]. 1928.

24) F. Engels, L. Feuerbach. GIZ, 1922. Pp. 50-51. [English edition, Ludwig Feuerbach and the end of classical German philosophy. In Marx & Engels, Selected works (three volumes). Progress Publishers Edition (Moscow, 1973). Vol. 3, p. 363.]