

**Vygotsky, L.S.; Luria, A.R. (1993): Studies on the History of Behavior
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Foreword, James V. Wertsch

With this general commitment to genetic method as a starting point, Vygotsky and Luria went on to identify "three main lines in the development of behavior – evolutionary, historical, and ontogenetic." By incorporating all three lines, or "genetic domains" (Wertsch, 1985, 1991) into their approach, Vygotsky and Luria outline a vision that differs markedly from that of most contemporary scholars under the rubric of developmental psychology.

Translator's Introduction, Jane E. Knox

In the strict sense of the word they offer not just a cross-cultural approach where various ethnic groups of preliterate people are compared, but a cross-historical approach that examines the different stages of development through which the human species passes from its original beginnings in the anthropoid apes. For Vygotsky's theory of human development, the terms cultural and historical are important, however, more emphasis is placed on historical differences. As Wertsch (1991) pointed out, "Building on the ideas of Hegel, Marx, Levy-Bruhl, and others, he (Vygotsky) tended to see what we would now term cross-cultural differences as cross-historical differences . . . this is a major point that distinguishes Vygotsky's ideas from those developed in American anthropology by Franz Boas, Edward Sapir, and Benjamin Lee Whorf" (p. 16).

The Vygotsky-Lurian approach embraces two opposing schools of thought about human development: that which has become known today as the American behaviorist school (stemming from Pavlov's stimulus-response paradigm, whereby the individual is treated primarily as a passive recipient of information from the environment) and the Cartesian line of reasoning that views "the human mind largely in terms of universal, innate categories and structure," whereby the environment plays a secondary role, "serving merely as a device to trigger certain developmental processes" (Wertsch, 1991, p. 8).

However, although in this book Vygotsky pays tribute to the theory of conditional reflexes, he now goes beyond them, focusing on Pavlov's later ideas. Namely, Vygotsky stresses and expands Pavlov's notion of the goal-oriented reflex as the major impetus for driving a work-oriented society of laborers. People must always have a goal toward which they strive. All human thought develops precisely from this striving: the greater the difficulty in reaching this goal the greater the "psychic" energy expended in achieving it, a view Vygotsky shared both with Bühler and Dewey.

As Vygotsky writes in the current text, "The work of the intellect begins at the point where the activity of instinct and conditional reflexes stops or is blocked."

However, there may be still other factors involved. First, Luria is reported to have said that Vygotsky was a speed reader with a photographic memory who could recall verbatim passages from any book that had particularly struck him.

TERMINOLOGY: "PRIMITIVE" AND "CULTURAL"

Against this popularized notion of primitivism, Vygotsky himself redefined these terms in the light of his own theory of development: As man progresses over history and a child through stages of development in his or her life time, the primitive or natural stage is not replaced by later cultural stages, rather the latter was superimposed like scaffolding on top of the former, changing, restructuring, and adapting these natural processes.

Thus, the psychology of a cultural man is not superior or inferior but different than that of a primitive man, just as the psychology of an adult is different from that of a child, particularly a child without schooling.

Vygotsky – Studies on the history of behavior

Vygotsky's approach to "primitive" or "primary" abilities found both in children and in so-called "primitive," uneducated, or "semi-illiterate" people is clearly an extension of Levy-Bruhl's similar approach to the thinking of primitive people. In *How Natives Think* Levy-Bruhl (1910/1926) said, for example, "Let us abandon the attempt to refer their mental activity to an inferior variety of our own" (p. 78).

As van der Veer (1991) pointed out, Vygotsky merited Levy-Bruhl for his claim that the higher mental processes in "primitive" people were not inferior but different from those in "cultural" or "civilized" people (pp. 9-10). The fundamental idea of cultural-historical theory was not necessarily a ranking of various ethnic groups but a description of the developmental different stages of the higher mental processes in relationship to the different stages and conditions of historical development.

As Tulviste (1987) reported, the foreword to the Russian edition of Levy-Bruhl's *Primitive Thought* illuminates the nature of this heterogeneity:

"There are not two forms of thinking for mankind, one logical, the other prelogical, separated from each other by an impenetrable wall. They are different thought structures that exist in the same society and often, perhaps always, in one and the same mind. (pp. 14-15)"

Vygotsky took as his point of departure Levy-Bruhl's view that these two types of thinking-prelogical and logical-are not incompatible and one does not necessarily cancel out the other. Accordingly, "In the mentality of primitive peoples, the logical and prelogical are not arranged in layers and separated from each other like oil and water in a glass. They permeate each other, and the result is a mixture which is very difficult matter to differentiate" (Tulviste, 1987, p. 106).

THE STRUCTURE OF THE BOOK

In order for the ape, and subsequently for human beings, to make an advancement in intellectual behavior, the necessary condition is that both must go beyond instinctive and learned reactions that fail to overcome some difficulty. In other words, these conditions are met when either apes, subsequently humans, find themselves in new conditions differing from those in which they have already grown accustomed or when they come across a difficulty, barrier, or obstacle.

The major point that Vygotsky makes here is that the difference between primitive and cultural people lies in their social development, not in their biological development. Each of these two processes is subjected to its own particular laws and represents two distinct lines of development (natural and physiological, on the one hand; cultural-historical, on the other).

Each type of memory (in primitive and in cultural man) has a different "tonality." As others have pointed out, Vygotsky also describes primitive memory as something photographic, eidetic, concrete-something that "stores representations with an enormous abundance of details precisely in the same order that they were presented in reality," just as does primitive man's language. Memory in the primitive has a different function.

Citing Jaensch's experiments with children, Vygotsky dwells on eidetism that represents the early, primitive phase in the development of memory. This is a primary undifferentiated stage of unity of perception and memory. The materials preserved in the primitive memory or memory of eidetic children is "unworked," "uncontrolled."

For Vygotsky, a skilled user of knots stands higher on the ladder of cultural development not because he has a superior natural memory but because he *has learned how to make better use of his memory with the help of artificial signs*. The historical development of human memory is then directly connected with the development and perfection of those "auxiliary means" that *social* human beings have created in their collective cultural life. Thus, here again we see the first stage of language development as an "interpsychological" process (interaction with others in the process of controlling one's environment), and the second stage as an "intrapsychological" process (interiorization of those symbols for the regulation of one's own behavior)

Luria's discussion of *natural* versus *cultural* memory represents another manifestation of the interrelationship between the two lines of development, the core of the Vygotskian-Lurian approach to development both in this book and all other major works. Cultural memory is memory that is mediated by symbolic systems otherwise known as mnemotechnic devices. Luria reviews data indicating that natural memory does not undergo any considerable growth with age, however, there is a gradual shift toward the use of artificial devices such as rips in paper or cutting out shapes of numbers that parallel the tallies and notches in wood made by primitive man to augment memory.

Vygotsky – Studies on the history of behavior

In an examination of the growth of attention, Luria proposed that, at first, the strength of the Stimulus caused by external physical objects Controls attention. Later, voluntary attention emerges in the child with the growth of his ability to actively manipulate external physical objects (such as the "forbidden colors" in the experiments introduced here) to regulate attention. Luria's experiments show that at a still more advanced stage older children cease to use external objects as mediating devices and shift to interiorized self-commands.

Luria gives the following description of speech development. A child suddenly and miraculously switches from vocalized reflexes and imitated sounds to sounded out thoughts ("concretization"), and then to sounds that serve a function or purpose. Once the young child has passed the imitation stage, when he or she repeated the sounds that adults have introduced, then the pragmatic function of speech emerges: the child discovers the functional use of a word as a means of naming an object, for expressing certain wishes, and getting control of those things that interest him or her. The initial one-word stage of speech production is characterized by the compression of a whole thought or wish, that is, a whole sentence, into one word that can mean many things.

Attention is given to Ach (1905, 1921) and his experiments to study the process of developing absolutely new concepts in children by using words as auxiliary tools. Although the artificiality of these experiments is pointed out, Luria welcomes the conclusion to which Ach came: artificial tools can aid a child to build a new concept and master a task that they would otherwise not have been able to complete. Herein lies the major importance of schooling for a child: it introduces the child to these tools and skills.

1 Behavior of the Anthropoid Ape

The first stage in the development of behavior in all animals is represented by hereditary reactions or innate modes of behavior. These are usually called instincts. They serve mostly to satisfy the basic needs of an organism. Their biological function is that of self preservation and reproduction. The main distinctive feature of instinctive reactions is that they operate without being learned and are structurally inherent to the organism.

...

The animal does not learn instinctive reactions in the course of its life; these [instinctive reactions-J. K.] do not appear as a result of trial-and-error or of successful and unsuccessful experiences; they are also not the result of imitation. This constitutes their main distinctive feature. The biological importance of instinctive reactions is that they are useful adaptations to the environment; they are developed in the course of struggle for survival and reinforced by natural choice in the process of biological evolution.

Vygotsky – Studies on the history of behavior

The second stage is built up and erected directly above the first and basic stage in the development of behavior. This is the so-called training stage or stage of conditional reflexes. The second class of reactions differs from the previous one in that it is not hereditary but arises from the animal's individual experience. All the reactions in this category are the result of specific learning, specific training, and individually accumulated experience. The usual conditional reflex, which is well known and described in the works of Pavlov and his school, may serve as the classic example of a reaction at the second stage.

It is now important for us to note only two aspects that characterize this second stage in the development of reactions. First we have in mind the connection existing between reactions of the second stage and instinctive or hereditary reactions. Studies of conditional reflexes have shown that any primary conditional reflex appears only on the basis of the unconditional reflex or instinctive hereditary reactions.

In essence, training does not create new reactions in the animal, but only serves to combine inherent reactions, giving rise to new conditional connections between the innate reactions and environmental stimuli. Thus, the new stage in the development of behavior arises directly on top of the foundation of the previous one. A conditional reaction is nothing more than an immediate reaction altered by the conditions under which it appeared.

The second aspect characteristic for this stage of behavioral development is the new biological function created by the conditional reflexes. Although instincts serve as a means of adapting to more or less constant, stable, and fixed environmental situations, conditional reflexes constitute a much more flexible, subtle, and refined mechanism of adaptation; in essence, this (mechanism allows) hereditary, instinctive reactions to adapt to the individual conditions of a given animal's existence. If Darwin has explained the origin of species, Pavlov has explained the origin of the individual, that is, the biology of the individual, particular experience of an animal.

Complete development of this second stage of behavior is found only in vertebrate animals, although some more primitive forms of conditional reactions may be seen already in ants, bees, and crabs. However, vertebrates are the first to demonstrate a shift in behavior. In spite of all the success achieved in training lower animals, the dominating, overpowering form of their behavior still remains the instinct. In contrast, in higher animals we note a shift toward the dominance of conditional reflexes in the overall system of reactions.

These animals are the first in which the plasticity of innate abilities is found; "childhood" in the proper sense of the word and, linked with it, "child" play emerge. Itself being a type of instinctive activity, play is also an exercise for other instincts, the young animal's natural school, its self-instruction or training. According to Bühler, "Young dogs, cats, and the human child play, whereas beetles and insects, even the highly organized bees and ants, do not. This cannot be mere chance, but must rest upon an inner connection: *play supplements the plastic dispositions*" (Bühler, 1919/1930, p. 9).

Finally, it is necessary to also note that the second stage has a reverse influence on the first. Conditional reflexes, being overlaid on top of unconditional reflexes, change the latter profoundly, and very often in the individual experience of an animal we observe "a perversion of instincts," that is, a new direction taken by an innate reaction due to the conditions in which it appeared.

The classic example of such a "perversion of instinct" is demonstrated by Pavlov's experiment where a conditional reflex is developed in a dog by cauterizing its skin with an electric current. The animal's first response to pain is a violent defensive reaction; it strains against its harness, it bites the device with its teeth, and it fights with all its might. But as a result of a long series of experiments, where pain stimulation was accompanied by food, the dog's response to burns on the skin began to be that very same reaction with which it usually responded to food. The famous English psychologist Sherrington, who was present at these experiments, said, looking at the dog, "Now I understand the joy with which martyrs ascended the fire."

On top of this second stage in the development of behavior, there arises the third and, apparently for the animal kingdom, last stage, which is, however, not the last for man. The presence of this third stage has been established with undoubted scientific certainty only in the behavior of the higher anthropoid apes. Darwin's theory stimulated precisely this search for and discovery of the third stage in these very animals.

Köhler chose to use this very approach in his analysis of ape behavior. He considered the invention and use of tools to be the most essential and distinctive characteristics of human behavior. That is why he undertook the task of showing that the rudiments of these forms of behavior could already be found in anthropoid apes.

Vygotsky – Studies on the history of behavior

Köhler's experiments basically involved three fundamental operations that an animal has to perform to solve a task. The first condition necessary for the solution of the task was that the animal had to find a *roundabout way* to reach the goal in situations where for some reason the direct solution was impossible; the second condition was linked to the need to *bypass or eliminate an obstacle* found on the path leading to the goal; and finally the third condition was the need to use, invent, or produce tools as a means for achieving an otherwise unachievable goal.

KÖHLER'S EXPERIMENTS

According to Köhler (1921/1926): "If under the pressure of '**necessity**,' in the special circumstances of an experimental test, some special method, say, of the use of tools, has been evolved - one can confidently expect to find this new knowledge shortly utilized in 'play,' where it can bring not the slightest immediate gain, but only an increased 'joie de vivre' " (p. 71).

INTELLECT AND THE NATURAL EXPERIENCE OF APES

Thus, the ape's intellectual reaction appears always in response to some **obstacle**, delay, difficulty, or barrier preventing its realization. The role that difficulties play in the process of acquiring new modes of action was made perfectly clear by Groos (1898/1907). He says, The moment repetition of a habitual reaction is interrupted, diverted, or delayed onto other paths, immediately consciousness rushes to the scene (if I may say so figuratively) in order to regain control over what it had before relegated to the domain of the unconscious processing of the nervous system.

Whenever everything is clear, whenever nothing is difficult for us, whenever there is no problem, then the thought process cannot even begin.

INTELLECT AS THE THIRD STAGE IN THE DEVELOPMENT OF BEHAVIOR

Bühler (1919/1930) compared this sudden change in the apes with similar phenomenon that he observed in experimental situations with people whom he had given difficult mental tasks. "Very often the solution dawns upon us suddenly." He continues:

The only account that they could give was that their decision had come to them with a sudden 'inner exclamation —AHA!' and therefore I am of the opinion that language has created a special interjection for this sudden 'inner illumination'-AHA' exclusively for the purpose of reporting these and similar experiences. Köhler's chimpanzees have experienced this 'AHA!' or something analogous to it (p. 14).

If the ability to use tools was developed in the ape as a result of instruction and training, then this ability would be tied to the objects used for training. Had the ape, for example, been trained to get fruit with a stick, he would in no way use a piece of cloth or hat brims for the same purpose. It is this transference of structure from some objects to others that also sharply distinguishes the apes' intellectual reaction from conditional reflexes.

USE OF THE TOOL AS A PSYCHOLOGICAL PREREQUISITE FOR LABOR

Precisely the absence of at least the beginnings of speech in the widest sense of the word—the lack of ability to make a sign, or introduce some auxiliary psychological means that everywhere marks man's behavior and man's culture – draws the line between the ape and the most primitive human being. Apropos of this. Bühler recalls Goethe's thesis on colors, which says that "mixing, smearing and dabbling with paints are inherent in man."

"According to Köhler's observations," Bühler said, "it turns out that mixing, soiling and smearing paints are inborn tendencies for the ape as well, but, in as much as we know, it is highly unlikely that at some time the chimpanzee saw a pictorial sign in a stain left by a crushed berry."

Vygotsky – Studies on the history of behavior

Of utmost importance for the history of thought development is the fact that thinking in a chimpanzee is absolutely independent of speech. We see the chimpanzee in a purely biological form of nonverbal thought that convinces us of the view that the genetic roots of thought and speech are different in the animal world. All the factors separating the behavior of ape and man could be summed up and expressed in one general statement to this effect: in spite of the fact that the ape displays an ability to invent and use tools—the prerequisite for all human cultural development—the activity of labor, founded on this ability, has still not even minimally developed in the ape. Use of tools in the absence of labor is what draws the behavior of man and ape closer and at the same time separates them.

However, we must not forget that *quantitative differences may transform into qualitative ones*. What may exist as a *rudimentary form* in one animal may become *outstanding signs* (in other species). We have to say that this is particularly true when it comes to the use of tools.

The entire existence of an Australian aborigine depends on his boomerang, just as the entire existence of modern England depends upon her machines. Take the boomerang away from the aborigines make him a farmer, then out of necessity he will have to completely change his life style, his habits, his entire style of thinking, his entire nature.

The development of man's behavior, however, is always development conditioned primarily not by the laws of biological evolution, but by the laws of the historical development of society. Perfecting the "means of labor" and the "means of behavior" in the form of language and other sign systems, that is, auxiliary tools in the process of mastering behavior, occupies first place, superseding the development of "the bare hand and the intellect on its own."

2 Primitive And His Behavior

THREE LINES OF PSYCHOLOGICAL BEHAVIOR

Psychology sees initial conditional reflexes, being studied in the laboratories, as the basis for the development of all human complex activity, a product of the cortex. It attempts to incorporate within a single law the movement of plants stretching toward the sun and Newton's calculations for the law of universal gravity "as individual links," to use Pavlov's words, "in a single chain of biological adaptation of organisms."

Another line of development has been studied just as extensively. Human adult behavior, as psychologists long ago established, is not formed immediately, but arises gradually and develops from child behavior. Albeit, psychologists and philosophers previously were eager to admit that man's ideas and thoughts constitute the innate core of his human soul and do not undergo development when the body of the child develops.

They were inclined to assert that the loftiest of man's ideas are present in the child at the moment of birth or even earlier. "I do not contend," wrote Descartes on this subject, "that the spirit of an infant in his mother's womb meditates about metaphysical questions, but he does have ideas about God, himself and all other truths which are known in and of themselves, just as they exist for adults, even when the latter don't think about these truths."

Conclusions drawn on the basis of such an assertion were formulated by Malebranche, who maintained that abstract, logical, metaphysical, and mathematical knowledge is most accessible to children. If ideas innately exist in children, then it is necessary to communicate eternal truths to the them as early as possible. The closer to the innate source, then the purer and truer the idea itself will be. The child's later sensory experience, grounded on incidental facts, will cloud the initial purity of an innate idea.

The behavior of modern, cultural man is not only the product of biological evolution or the result of childhood development, but also the product of historical development. In the process of mankind's historical development, change and development occurred not only in the external relations between people and in man's relationship with nature – man himself, his very nature, changed and developed.

THREE THEORIES OF CULTURAL HISTORICAL DEVELOPMENT

Vygotsky – Studies on the history of behavior

Levy-Bruhl

He proceeded from two fundamental positions. The first is contained in the view that on the basis of the laws of an individual psychology, as, for example, the laws of the association of ideas, it is impossible to explain the beliefs and collective ideas that have sprung up as social phenomena in a community of people. These collective ideas arise as a result of the social life of a given people and are common to all members of a given group. In this case, they are conveyed from one generation to another. They are transmitted to an individual often in ready-made form and are often not further developed by that individual. They precede and outlive this person, just as language has a similar social existence, independent of any separate individual.

The second initial research position assumes the following: Various types of individual psychologies correspond to various types of societies. These psychologies differ from one another in the same way that the psychologies of vertebrates and nonvertebrates differ.

Of course, as with different animals, so too with various social structures there are universal traits inherent in every type of human society—language, traditions, institutions. But along with these universal properties, Levy-Bruhl said human societies, like organisms, can present profoundly differing structures, and, consequently, corresponding differences in the higher psychological functions. Therefore, it is necessary to renounce the idea of reducing from the very onset all psychological operations to a single type independently of the structure of a society, and explain all collective ideas by a psychological and logical mechanism that always remains one and the same.

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Levy-Bruhl set himself the task of comparing two psychological types that are at a maximum distance from each other: thinking in a primitive man and in a cultural man. The basic conclusions to which he came in his experiments is that higher psychological functions in a primitive man differ profoundly from those functions in a cultural man, that consequently the very type of thought process and behavior represents a historically changing quantity, and that the psychological nature of man also changes in the process of historical development, just as does his social nature.

"Primitive thought," Thurnwald says, "really only seems alogical." In actuality, it is completely logical from the viewpoint of primitive man himself.

When suffering from some attack or disease, primitive men assumed that some evil spirit had taken hold of them. In order to cure the sick man they try to exorcise this spirit. For this they use those methods that are seemingly supposed to drive away an actual person: they give the spirit a name, demand that it leave, or frighten it with noise.

Not only Thurnwald's position, but also objective psychology has raised substantial objection to Levy-Bruhl's theory. Thurnwald correctly noted that from the subjective point of view of primitive man himself, his magical ceremonies to exorcise the spirit and heal a sick man are absolutely logical. It is easy to show, however, that this very same man also exhibits, objectively speaking, logical thinking in all those circumstances where activity is oriented toward direct adaptation to nature. Invention and use of tools, hunting, cattle-raising and farming, and waging war all demand from him real, not just apparent, thought. With complete justification, one critic observed that primitive man would assumably perish the next day, if he did not actually think in the sense that Levy-Bruhl intended.

PRIMITIVE MAN AS A BIOLOGICAL TYPE

"Much of what superficial observation ascribes to physiological organization," he [Thurnwald – B.S.] said, "is caused by severe cultural backwardness." In this case the cause, therefore, may be confused with the effect and vice versa. It is not so much the case that underdevelopment may be blamed for primitive behavior as it is that primitive behavior results in an early halt in development.

MEMORY IN PRIMITIVE MAN

Leroy, with full justification, reduced all the peculiarities of primitive memory to its function. A primitive man must rely only on his direct memory—he has no written language. Therefore, we frequently find a similar form of primitive memory in illiterate people. The ability, then, of primitive man to orient himself or to reconstruct complicated events by tracks, in the opinion of this author, must find its explanation not in the superiority of direct memory, but in something else. The majority of dark-skinned people, as one observer testifies, do not find a road without some kind of external sign. Orientation, Leroy believed, has nothing in common with memory. Similarly, when a primitive man reconstructs some event according to tracks, he makes use of his memory to no greater extent, than when a judge who reconstructs a crime by traces left. Here, the power of observation and deduction play the dominant role, not memory. The organs of perception are more developed in the primitive man because of greater use, which accounts for his difference from us in this area. But this ability to decipher tracks is not the product of instinct, but the result of training. Parents teach their children to distinguish tracks. Adults imitate the tracks of an animal, and the children reproduce them.

According to Jaensch (1925/1930), the essence of this form of memory is a person's ability to literally reproduce visually a previously preconceived object or picture immediately after seeing it, or even after a long interval of time. Such people are called eidetics and this form of memory is called eidetism. This phenomenon was discovered by Urbanchich in 1907 and has been investigated and analyzed by the Jaensch school only in the last decade.

This type of eidetism is observed not only in the sphere of visual sensations, but also in the sphere of audible and tactile sensations.

Among cultural peoples, eidetism is widespread for the most part only in children; among adults eidetism is a rare exception. Psychologists believe that eidetism represents an early, primitive phase in the development of memory that the child usually outgrows by the time of puberty and that is seldom preserved in an adult. It is more widely found among mentally and culturally deprived children.

Man uses it but does not control it, in the words of Engels. To the contrary, this memory dominates him. It evokes in him unreal fantasies, imaginary images, and fabrications. It causes him to create myths that often serve as obstacles on the developmental path of his experience; his subjective inventions shroud over an objective picture of the world.

Our written word has a very long history. The first tools of memory are signs, as, for example, the golden figures of West-African story tellers; each figure recalls some particular tale. Each of such figures seems to represent the initial name of a long story—for example, the moon. Essentially, the bag with such figures represents a primitive table of contents for such a primitive storyteller.

We shall not elaborate on the subsequent history in the development of writing; let us say only that this shift away from the natural development of memory to the development of writing, from eidetism to the use of external systems of signs, from mnemonic activity to mnemotechnics, constitutes an essential turning point or sudden change determining the entire subsequent course of the cultural development of human memory. External development takes the place of inner development. Memory is perfected in as much as systems of writing—systems of signs and ways of using them—are developed. What was perfected in the Ancient and Middle Ages was called *memoria technica* or artificial memory. The historical development of human memory can basically and primarily be summed up as the development and perfection of those auxiliary means that social humans have worked out in the process of their cultural life.

Therefore, Baldwin was right when he defended the position that any evolution is in the same degree an involution, that is, any process of development has included as its major component the backward processes of the curtailment and atrophy of old forms.

THINKING IN CONNECTION WITH THE DEVELOPMENT OF LANGUAGE IN PRIMITIVE SOCIETY

Vygotsky – Studies on the history of behavior

One of the Northern primitive peoples, for example, has a multitude of terms for designating different species of deer. There is a special term for designating a deer that is one, two, three, four, five, six, and seven years old; there are twenty words for ice, 11 words for cold, 41 words for snow in different forms, 26 verbs in order to designate freezing or thawing, and so forth. Here is why "they resisted any attempt to exchange their language for Norwegian, which is too poor from this point of view" (Levy-Bruhl, 1910/1926). This very phenomenon explains the large quantity of proper names that are given to the most varied individual subjects.

This flexible, detailed description turns out to be both the greatest advantage and the greatest drawback of primitive language. The great advantage is that such language creates a sign for almost every real object and provides the primitive man with the unique possibility of having at his disposal exceedingly exact replicas of all the objects with which he comes in contact. So it is quite clear that, given the primitive man's characteristic mode of life, for him to shift from his native tongue to a European language would mean to immediately deprive him of his most powerful means of orientation in life.

Wertheimer described a semi-primitive man who, while being taught a European language, refused to translate the following phrase from one of the exercises: "A white man killed six bears." A white man cannot kill six bears, that is why the expression itself seemed impossible [to him]. This demonstrates the degree to which language is here understood and used only as a direct reflection of reality. It also demonstrates the extent to which it is still far removed from an independent function.

This second language—the language of signs or gestures—is extremely widespread among primitive peoples, but is used in different situations and in different combinations with verbal language. For example, Gason described how, for one tribe, sign language existed side by side with the oral language. Animals, natives, men, women, sky, earth, [the acts of] walking, mounting a horse, jumping, stealing, seeing, eating, drinking, as well as hundreds of other objects and actions have a special sign, so that a whole conversation can be conducted without a single word (cited in Levy-Bruhl, 1910/1926, pp. 159-160).

Humboldt quite reasonably said that in these languages one feels as if transferred to a completely different world because, when prompted by this type of language, perception and interpretation of the world differ profoundly from the manner of thinking that is characteristic for an educated (cultural) European.

Thurnwald, in complete agreement with these data, said that with respect to the number of words, the language of primitive man can in no way be said to be limited in expressions. From this point of view, that is, concreteness of expression, the language of primitive people surpasses the language of the cultural man. "However, it (the language of primitive man) is too closely connected with a specific activity occurring in a small space and with the living conditions to which the small group using this language is confined. Characteristics of the life of this group are reflected in a primitive man's language, as if in a mirror."

A complex differs from a concept by the relationship established between the individual object and the group name. Looking at an object, I can state absolutely objectively whether it is a tree or a dog, because "tree" and "dog" stand for the designations of concepts, that is, general, generic groups to which different individual objects can be referred on the basis of certain essential features. Looking at a human being, I cannot say whether or not he is a Petrov. To do this, I must simply determine in fact whether or not this person belongs to this family. Thus, in the complex, the individual is retained as such. In the concept, different elements are combined not on the basis of some intrinsic substantial bond, but on the basis of the real, concrete contiguity that actually exists between them in one way or another.

Thus, we see that primitive thinking, which is connected with primitive language, can be characterized by the same developmental specificity as memory. Remember that development of memory is associated with a transition from the perfection of organic memory to the development and perfection of mnemotechnical signs used by memory. Similarly, the development of primitive thinking is in no way an accumulation of more and a more sophisticated reproduction of details. The very essence of this type of primitive thinking undergoes changes, shifting to the development and perfection of language and its usage, that is, to the development of this fundamental means for facilitating the perfection of thought.

Vygotsky – Studies on the history of behavior

The main progress in thought development affects a shift from the first mode of using a word as a proper name to the second mode, where a word is a sign of a complex, and finally to the third mode, where a word is a tool or means for developing the concept. Just as the cultural development of memory was found to have the closest connections with the historical development of writing, the cultural development of thinking is found to have the same close connection with the history of the development of human language.

NUMERIC OPERATIONS AND PRIMITIVE MAN

These operations depend to a greater degree on memory. Primitive man counts in a way that is different from our way (of counting) — a way that might sooner be termed concrete—and with this concrete method (of counting), primitive man again surpasses cultural man. In other words, the study of the calculation processes in primitive man shows that here again, as with memory and speech, primitive man is not only not inferior (poorer), but in a certain sense superior (richer) to cultural man. Thus, it would be more correct to speak here not about quantitative differences, but about the qualitatively different way in which primitive man counts.

The primitive perceives a group of objects in its quantitative aspect. In this case, the qualitative characteristic appears as the known, immediately perceived quality distinguishing this group from other groups. And the primitive can judge by the outward appearance whether the group is complete or not. It must be said that this immediate perception of quantities can be found in cultural man as well, mainly in cases of perception of ordered quantities. If a performer were to omit one bar from a piece of music, or someone were to "steal" one syllable from a poem, immediately, without resorting to calculations, we would conclude on the basis of the immediate perception of the rhythm that a bar or a syllable is missing.

What usually struck the researchers was the level of sophisticated differentiation the primitive man reached in this art. Researchers tell us that on the basis of his outstanding memory, the primitive refines this immediate perception of quantities to the greatest degree. Collating the present impressions with an image in the memory, he detects the absence of one object in some large group.

When the primitives prepare for a hunt, they glance over their many dogs and immediately notice if one is missing. In just the same way, the primitive man can detect the absence of a single animal in a herd of several hundred animals. This precise differentiation is essentially a further development of the same immediate perception of quantities that we notice in ourselves.

However paradoxical this conclusion may seem, it is nevertheless true: In the lowest [most primitive-J. K.] societies, people calculated for centuries without numbers. It would be a mistake to believe that the human mind created numbers in order to count; on the contrary, people began counting before they managed to create numbers.

PRIMITIVE BEHAVIOR

Just as the increasing supremacy of man over nature is based not so much on the development of his natural organs but on the perfection of his technology, so too the continuing growth of his behavior stems primarily from the perfection of external signs, external methods and ways that develop in a certain social context under the pressure of technical and economic needs. All of man's natural psychological operations are reconstructed under this influence as well. Some of them die out, others develop. But most important, most crucial, and most characteristic for the whole process [of the development-J. K.] is the fact that its perfection comes from outside and is determined in the end by the social life of the group or a people to which the individual belongs.

However, it would be the gravest mistake to make, as Levy-Bruhl did, the magical character of primitive thinking and behavior an absolute and to ascribe to it the significance of a primary, independent trait. Studies show, as Thurnwald said, that magic is not significantly widespread among the most primitive peoples. Its development takes root only among semideveloped primitive people and flourishes among the highest [most developed-J. K.] primitives and ancient, cultural [civilized-J. K.] people. Substantial cultural development is the necessary prerequisite for the appearance of magic.

Vygotsky – Studies on the history of behavior

Thurnwald then showed that a certain development of technical power in the hands of the primitive is a necessary prerequisite for the appearance of magic. This development of primitive technology and thinking is the necessary precondition for behavior to acquire a magical character. Therefore, it is not magic that generates primitive technology and the mode of primitive thinking, but technology and, connected with it, technical means of primitive thinking that generate magic.

We have already referred the view of one researcher, according to which the primitive would die within a day, if he really thought as Levy-Bruhl described. This is really true. Any adaptation to nature, any primitive technical activity, hunting, fishing, war – in short, everything that constitutes the real foundation of his life would be impossible on the grounds of magic thinking alone. Similarly, no regulation of behavior, no mnemotechnics, no writing or numeration, and no use of signs, would be possible on the basis of magic alone. Control of the natural elements and one's own behavior requires not imaginary but real thinking, not mystical but logical thinking, not magical but technical thinking.

3 The Child and Its Behavior – Luria

If we wish to study the psychology of an adult cultural man, we have to bear at least in mind that it developed as a result of a complex evolution that combined at least three courses: the course of biological evolution from animals to the human being, the course of historical cultural evolution, which resulted in the gradual transformation of primitive man into modern cultural man, and the course of individual development of a specific personality (ontogenesis), as a result of which a small newly born creature passes through a number of stages, turning into a schoolchild and then into an adult cultural man.

We believe that each of these evolutionary courses—the development from ape into human being, from primitive man into a representative of the cultural era, and from child into adult — follows its own individual path that is influenced by specific factors and passes through specific, often idiosyncratic forms and developmental stages. That is why when analyzing the adult cultural man, in addition to the evolution of the behavior of the animal and of primitive man, we must also study the development of child behavior.

ADULT AND CHILD: THE PRINCIPLE OF METAMORPHOSIS

One inaccurate concept has become deeply rooted in the general consciousness; that is the notion that a child differs from an adult only quantitatively. We only have to shrink the adult, make him weaker, reduce his skills, make him a little less intelligent and we will have a child.

For centuries, people underestimated the fact that the child both in physical appearance and psychological characteristics is a very special type of creature, who qualitatively differs from an adult and whose laws of life and activity should undoubtedly be studied with particular attention. Indeed, not only does the child think in a different way, perceiving the world differently from an adult, not only is the child's logic based on qualitatively different principles, which are characterized by great specificity, but in many aspects the structure and functions of his body differ greatly from those of the adult organism.

Of great, determining importance for the adult are those behavioral functions that connect him with the environment and that by themselves are the product of this social, cultural influence, that is, his perceptions, his skills, and his intellect. For the infant, the dominant role is played by organic sensations restricted to the body (primitive drives, stimulations from the mucous membrane of the mouth, etc.—constant internal stimuli). Those things that are most essential in the behavior of the adult are missing in the infant. The primitive phase of an infant's development is characterized by different values, different proportions, and different laws; in certain respects, the infant differs from the adult no less than a chrysalis from a butterfly (Werner 1926: see also Buhler, Hetzer & Tudor-Hart 1927).

Reality starts to exist for the child in those forms that we perceive in a rather late period of his development. For example, only after 1 1/2 months does an infant show coordinated eye movements; it is only from this moment that the child is capable of shifting his eye-gaze from one object to another and from one part of the object to another; and, as we well know, exactly these coordinated eye movements are the necessary condition for seeing.

Vygotsky – Studies on the history of behavior

The first "organic" principle of existence begins to be replaced by a second principle—the principle of external and, what is most important, social reality.

It would be wrong to believe that the child is a blank sheet of paper that is to be gradually filled by a text drawn up by life. This sheet of paper is already covered by letters inscribed during the first weeks and months of the child's life, and this sheet begins to frantically fill up with the letters from the time the child has established contacts with the world. However, these are letters in quite a different language, which we often understand rather badly; they often remind us of some language that has died out, the language of the a primitive man. It is absolutely wrong to think that a child, for example a 2 or 3-year-old, is simply more stupid than the adult—that the child is simply an underdeveloped man. The child is intelligent in his own way, but compared to us he perceives the world in a more primitive way; he treats it in a different way, he thinks differently from us.

PRIMITIVE PERCEPTION

One researcher, Major (1906), tried to conduct special experiments to clarify the above arguments; he offered colorful pictures to children of different ages and observed their behavior with respect to these pictures (p. 251). It turned out that children at different ages behaved differently in this situation and three specific stages can easily be distinguished in the child's attitude toward a picture. At first, the child does not treat the picture as a portrayal (first stage): he treats it simply as a motley piece of paper, he snatches it, tears it. The second stage comes when the previously described mechanisms seemingly begin to dominate: the child begins to perceive the picture's contents as an image and begins to treat the things, depicted in the picture, *as real*. He tries to snatch them, to speak to them,—in a word, he does not make any distinction between the real things and their depiction. Much later the third stage starts: the child begins to distinguish real things from their depictions, and his attitude toward both begins to differ greatly. However, this third stage begins rather late and we can say that the psychological life of the child at the first steps of his development is particularly characterized by the manifestations that are similar to the behavior noted here and stem from the child's poor differentiation of stimuli.

Child speech and thinking will have to develop; his experience, aimed at reality, will have to become firmly established and acquire enough independence; the vivid "eidetic" visual images, which play such an important role in the child's mind, will have to fade away. In short, a significant cultural reconstruction has to take place in order for the child to shift from the stage of primitive perceptions to the next one—to the stage of competent forms of adaptation to the external world.

PRIMITIVE THINKING

Certainly, this does not mean that child thought has no laws of its own. On the contrary, there are quite definite laws of child thought that differ from the laws of thinking in adults: a child of this age (3-4) has his own primitive logic, he has his own primitive modes of thinking; all of them are determined by the fact that this thinking unfolds on a primitive base of behavior, which has not yet had sufficiently serious encounters with reality.

If we analyze the functions of adult thinking, we will quickly find that it *organizes our adaptation to the world in particularly difficult situations*. It regulates our attitude toward reality in particularly complex conditions where simple instinct or habit is insufficient. From this point of view, the function of thought is to adequately adapt to the world; the form [thinking takes] is the organization of our influence on the world. This function determines the whole construction of our thinking. In order that thought makes possible an efficient influence on the world, it must function with a maximum of correctness: it must be faithful to reality without merging with fantasy. Each step in our thinking must be checked by practice and pass this test. Indeed, the thinking of a normal adult meets all these requirements and only in those who have some mental or neurological illness does thinking acquire different forms that are not connected with life and reality and do not organize an efficient adaptation to the world.

It is quite a different story with a small child. Being unable to perform sequenced actions, the child follows a particular path of minimal resistance: If the external world proves unable to supply the child with something real, he compensates for this shortage with his fantasy. Unable to adequately react to some obstruction to his goal, the child reacts inadequately by creating for himself an illusory world where all of his wishes are realized, where he is the complete master and the center of the created universe; the child creates the world of illusory egocentric thinking.

Vygotsky – Studies on the history of behavior

Finally, we are able to capture the affect of the same egocentric thinking in the child's characteristic attitude toward the conversation of others and toward the phenomena of the external world: He is sincerely confident that there is nothing incomprehensible for him, and we almost never hear the words "I don't know" from a 4- to 5-year-old child. Further on we will see that it is very difficult for the child to hold back the first solution that came to mind, and that it is easier for him to give an absurd answer than acknowledge his own ignorance.

We have already mentioned that the child who has an egocentric attitude toward the external world perceives its objects concretely, holistically, and first of all from that angle that addresses the child himself, from that aspect that affects him directly. The child still has not developed an objective attitude toward the world, an attitude that allows him to disengage from an object's perceived concrete features and that directs his attention to the objective correlations and laws. The child accepts the world the way he perceives it; he does not care about the connections among the individual pictures he perceives, nor about the construction of a systematic picture of the world and its phenomena. This sort of picture is necessary for the cultural adult whose thinking must regulate his interactions with the world. It is exactly this logic of relations, causative connections, and so on that is missing in the child's thinking and is substituted by other primitive logical devices [of thinking].

We see that, in all the above cases, the child mixes cause and effect, and it turns out to be almost impossible for him to get a correct answer: thinking that correctly operates with the category of cause seems to be completely alien to the child. Significantly closer to the child is the category of goal - this is quite understandable if we remember the child's egocentric set.

It is quite natural that a large number of those words and concepts that the child encounters turn out to be new and unknown. However, adults use these words and in order to catch up with them and not seem inferior or more stupid, the small child develops a rather unique way of adapting. In this way, the child spares himself the feeling of inferiority and makes it possible for him to master, if only in appearance, those expressions and notions that he does not yet know. Piaget, who has extensively studied this mechanism of child thinking, called it *syncretism*. This term denotes an interesting phenomenon, traces of which can be found in the adult but which flourish in the child's mind [psyche-J. K.]. The essence of this phenomenon is the following: Concepts that have only one external aspect [in common —J. K.] are brought together with extreme ease and an unknown concept is replaced with a more familiar one. Such substitutions of the unknown with the understandable, such mixtures of meanings, are found in child fairly often.

So how does thinking proceed in a child? What laws underlie a child's inferences, and how does the child construct judgments? After everything that has been said above, it is clear that developed logic with the limitations it imposes on thinking, with all of its complex conditions and regularities, cannot exist for the child. A child's primitive, precultural thinking is constructed in a much simpler way: it is an immediate reflection of the naively perceived world, and for the child one detail, one incomplete observation, may be enough for a corresponding (though a completely inadequate) inference. Thinking in adults proceeds according to laws of complex combination involving the accumulation of experience and inferences from generalizations. It follows the laws of inductive-deductive logic, whereas thinking for the young child is, according to Stern (1914) "transductive" (pp. 272-275). It develops neither from the general to the specific nor from the specific to the general; it simply infers from one episode to another, guided each time by new features that catch the child's attention. The child immediately finds a corresponding explanation for each phenomena and does it directly without any logical intermediate steps, without any generalizations.

The child draws a conclusion from one episode and then from another, and if his inferences are contradictory, this does not bother him. This is because the child still does not possess those laws of logic that are rooted in objective experience-in encounters with reality-and based on a validation of assumed suppositions, that is, on the laws of logical thought developed by culture. That is why there is nothing more difficult to do than to derail a child with the realization of the contradictory character of his inferences.

Vygotsky – Studies on the history of behavior

The child knows no barriers on the basis of which he can establishing causal dependence, that is, barriers that exist in reality and that in some natural way become clear for the cultural adult only after long familiarization with the external world. In the child's understanding, one thing can influence another independently of distance, time or complete absence of any connections between them. This character of understanding differentiates between reality and fantasy achieves illusory satisfaction of his wishes in cases when reality cannot provide it for him.

Beginning his life journey as an "organic creature," the child preserves his introversion and egocentrism for a long time. Prolonged cultural development is necessary in order for a primary weak connection with the world to become established and the harmonious apparatus, which we call cultural adult thinking, to finally replace primitive thinking.