

The Marxist categories of the "abstract" and "concrete" and the cultural-historical school of psychology¹

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The categories "abstract" and "concrete" are extremely important not only for psychology, but for logic, linguistics and philosophy. They play a major role in our understanding of ourselves and fellow humans, and in the planning of our social and political actions. Because Marx was acutely aware of this, and despite the fact that the treatment of the categories of the "abstract" and "concrete" is nowhere fully explicit in any of his writings, he reconceptualized them in a revolutionary manner.

The use of the categories of "abstract" and "concrete" within the English language publications of the Marxist cultural-historical school of psychology will be surveyed informally. It will be shown that Vygotsky's and later, Luria's usage of the categories "abstract" and "concrete", are increasingly incompatible with Marx's usage. Leontyev did not address the issue. The main contribution of this essay will therefore be an attempt to draw out

- 1) the impact of this tension on the cultural-historical school of psychology, and indirectly, on activity theory and
- 2) the reorganisation of activity theory which can and must be carried out to permit it to become more internally coherent on the one hand, and to interface more naturally with other disciplines, linguistics, logic, pedagogy, philosophy, history, and politics, thereby assuring a wider (external) coherence for the theory.

The history of conceptions of the categories abstract and concrete

The history of conceptions of the categories of "abstract" and "concrete" is relatively uniform in its pre and post-(non)-Marxist ambulation (Hegel excepted). In short, from Indo-Christian culture to post-industrial positivism, "concrete" is stated to be low-level cognition and "abstract" to be high level cognition.

Marx's view of these categories is an inversion of sorts and a dialectical sublation of this antinomy. For Marx, an "abstract" concept is an undeveloped unity of identical aspects of a representation of a thing or process. A "concrete" concept is a developed unity of diverse aspects of a representation of a thing or process. More specifically, a "concrete" concept is a logically coherent system of definitions each of which is abstract, in isolation, but each of which becomes endowed with concreteness with development of the concept. In Marx's interpretation, both types of cognition, "abstract" and "concrete", have real referents, and both can consist either of a verbal (conceptual) or non-verbal (cognitive-perceptual) process.²

The early cultural-historical school of psychology and the categories of "abstract" and "concrete"

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² For an exhaustive philosophical exposition and development of the Marxist conception of the categories of "abstract" and "concrete", see Ilyenkov (1982). For further development of these categories in the context of activity theory, see Davydov (1984).

Though Vygotsky came close to the Marxist concept, he did not fully recognize it. He tended to relegate concrete thought to factually based mental "complexes" (perception) and abstract thought to logical "concepts":

"In the experimental setting, the child produces a pseudo-concept every time he surrounds a sample with objects that could just as well have been assembled on the basis of an abstract concept. For instance, when the sample is a yellow triangle and the child picks out all the triangles in the experimental material, he could have been guided by the general idea or concept of a triangle. Experimental analysis shows, however, that in reality the child is guided by the concrete, visible likeness and has formed only an associative complex limited to a certain kind of perceptual bond. Although the results are identical, the process by which they are reached is not at all the same as in conceptual thinking." (Vygotsky 1962, p. 66).

In an attempt to maximally schematize the distinction, Vygotsky relegated concrete cognition to "immediate sensory grasp" of an object, and elevated abstract cognition to "maximally generalized conceptualization of an object" (p. 112). He further tended to view concrete thought as spontaneous and abstract thought as deliberate:

"All these traits of written speech explain why its development in the schoolchild falls far behind that of oral speech. The discrepancy is caused by the child's proficiency in spontaneous, unconscious activity and his lack of skill in abstract, deliberate activity." (Vygotsky 1962, p. 100).

At one point Vygotsky glimpsed that concreteness re-emerges in what he conceived to be the ascension to the abstract as "a difficult transfer of abstract" concepts to varying "concrete" applications. He drew the correct conclusion that this demonstrates the unviability of interpreting cognitive growth as pure acquisition of logical prowess, but failed to allocate to this operation its full positive status:

"The greatest difficulty of all is the application of a concept, finally grasped and formulated on the abstract level, to new concrete situations that must be viewed in these abstract terms - a kind of transfer usually mastered only toward the end of the adolescent period. The transition from the abstract to the concrete proves just as arduous for the youth as the earlier transition from the concrete to the abstract." (Vygotsky 1962, p. 80).

It is remarkable that both Vygotsky and Luria viewed concrete thought as "unstable" and abstract thought as "stable". This betrays their insufficiently dialectical view of the category of concreteness in particular - their interest being excessively focussed on limited pieces of observation of child cognition:

"In pathological disturbances of conceptual thinking, the measure of generality of concepts is distorted, the balance between the abstract and the concrete is upset, and the relationship to other concepts becomes unstable. The mental act through which both the object and the object's relation to the concept are grasped loses its unity, and thought begins to run along broken, capricious, illogical lines" (Vygotsky 1962, p. 113-114).

"[...] operations are performed on a verballogical plane and [...] the word has acquired a new stable, abstract meaning" (Luria 1982, p. 68).

The clearest representation of "concrete" and "abstract" as a linear progression from lower to higher cognition, the most obviously non-Marxist account of the relation between the two categories, is provided by Luria:

"[...] unlike animals, humans possess new forms of reflecting reality - forms which are not visual and concrete but are abstracted through experience, forms which are not sensory but are rational." (Luria 1982, p. 19).

The cultural-historical psychologists did construct a powerful theory of cognitive development inspired by the Marxist worldview, and by extremely rich observation of normal and ontological development and careful experimentation. We shall focus therefore on their contributions to development of cognitive processes referred to above and critical for contextualizing the impact of these theoretically estranged, and extremely important categories of "abstract" and "concrete" on otherwise Marxist scientific theory. These most relevant processes, for the purpose of this essay are the development 1) of analysis and synthesis, 2) of generalization and differentiation, 3) of semantic cognition, 4) of the topology of flow of cognitive processing (microgenesis) and 5) of the implementation of phylic and historical structure within the developing thinking brain.

The human development of analysis and synthesis

Like many non-Marxist psychologists, the cultural-historical psychologists were acutely aware of the fact that cognition moves back and fourth between analysis and synthesis. Vygotsky was not prepared however to recognize that this occurs in the ascension to the concrete:

"The advanced concept presupposes more than unification: To form such a concept it is also necessary to abstract, to single out elements, and to view the abstracted elements apart from the totality of the concrete experience in which they are embedded. In genuine concept formation, it is equally important to unite and to separate: Synthesis must be combined with analysis. Complex thinking cannot do both. Its very essence is overabundance, overproduction of connections, and weakness in abstraction." (Vygotsy 1962, p. 76).

Vygotsky was aware of the possibility of undeveloped abstraction evolving toward a more advanced synthetic whole supported by language, but this did not, in his mind, correspond to a concrete concept but rather to a more abstract concept:

"A concept emerges only when the abstracted traits are synthesized anew and the resulting abstract synthesis becomes the main instrument of thought. The decisive role in this process, as our experiments have shown, is played by the word, deliberately used to direct all the part processes of advanced concept formation." (Vygotsky, 1962, p. 78).

Luria approached the problem in a more complete but not sublative manner by stating that the support provided by language for the development of abstraction is analytic as well as synthetic:

"By the "meaning" of a word, we understand the capacity of a word not only to substitute or represent objects, not only to elicit associations, but also to analyze objects, to isolate and generalize their properties. A word not only substitutes for a thing, but also analyzes it by introducing it into a system of complex associations and relations. It is this abstracting and generalizing function that is known as its meaning." (Luria 1982, p. 37-38).

The development of generalization and differentiation

We have previously seen that Vygotsky associated the generalization function with the category of "abstractness" (p. 113). Though he admitted that concept formation also proceeds by differentiation, the dominant category, or ultimate achievement, in his mind was generalization:

"From primitive generalizations, verbal thought rises to the most abstract concepts. It is not merely the content of a word that changes, but the way in which reality is generalized and reflected in a word." (Vygotsy 1962, p. 121-122).

Vygotsky described how generalized concepts reinforce memory thereby increasing cognitive proficiency:

"[...] as higher levels of generality and equivalence of concepts are reached, it becomes easier for a child to remember thoughts independently of words. A young child must reproduce the exact words in which a meaning was conveyed to him. A schoolchild can already render a relatively complex meaning in his own words: thus his intellectual freedom increases." (Vygotsky 1962, p. 113).

He further heavily associates generalization with verbal abstraction by bluntly (incorrectly) stating that neither perception nor memory generalize:

"[] thought of a higher level is governed by the relations of generality between concepts - a system of relations absent from perception and memory" (Vygotsky 1962, p. 116).

Luria adds an interesting twist by claiming that the child manifests a predominance of "concrete" conceptual differentiation before maturing into a state of predominance of "abstract" conceptual generalization:

"The predominance of differentiation during early ontogenetic stages is a manifestation of the fact that the processing involved relies on concrete description. The transition from differentiation to generalization reflects a transition from the isolation of features based on a concrete representation to abstract, verbal-logical generalization." (Luria 1982, p. 60).

Development of semantic cognition

In Luria's account of semantic development, heavily inspired by Vygotsky and Jacobson, we find again the linear notion of progress from concreteness (syntagmatic operations) to abstraction (paradigmatic operations):

"Consciousness [...] begins to assume a concrete character. Words, through which the world is reflected, evoke a system of practically actuated connections. It is only at the final stage that consciousness acquires an abstract verbal-logical character, which differs from the earlier stages both in its meaning structure and in psychological processes, although even at this stage the connections that characterize the previous stages are covertly preserved." (Luria 1982, p.53).

Topological aspects of the development of flow of cognitive processing (microgenesis)

We find the first such demarcation in Vygotsky's rejection of Piaget's notion of egocentric thought. In Piaget's account, the child speaks to himself prior to acquiring socialized (external) speech. Vygotsky argues, correctly of course, that the developmental course is the inverse of this:

"In our conception, the true direction of the development of thinking is not from the individual to the socialized, but from the social to the individual." (Vygotsky 1962, p. 20).

Another topological arrangement of the developmental course of thought flow discovered by Vygotsky is what he terms the "bottom-up" development of spontaneous (everyday) conceptualization and the "top-down" development of scientific thought. Here again Vygotsky comes close to a dialectical account of the interplay of "abstract" and "concrete" categories in cognition:

"A child's everyday concept, such as "brother" , is saturated with experience. Yet, when he is asked to solve an abstract problem about a brother's brother, as in Piaget's experiments, he becomes confused. On the other hand, though he can correctly answer questions about "slavery", "exploitation" or "civil war", these concepts are schematic and lack the rich content

derived from personal experience. They are filled in gradually, in the course of further schoolwork and reading. One might say that the development of the child's spontaneous concepts proceeds upward, and the development of his scientific concepts downward, to a more elementary and concrete level. This is a consequence of the different ways in which the two kinds of concepts emerge. The inception of a spontaneous concept can usually be traced to a face-to-face meeting with a concrete situation, while a scientific concept initially involves a "mediated" attitude toward its object." (Vygotsky 1962, p. 108).

Luria expands this notion to the entire cognitive apparatus, thereby losing the distinction between spontaneous and deliberate thought, but sowing another germ of a potentially dialectical account of the co-operation of "abstract" and "concrete" categories:

"Conversely, in the adult person, with his fully formed higher psychological functions, the higher cortical zones have assumed the dominant role. Even when he perceives the world around him, the adult person organizes (codes) his impressions into logical systems, fits them into certain schemes; the highest, tertiary zones of the cortex thus begin to control the work of the secondary zones which are subordinated to them, and if the secondary zones are affected by a pathological lesion, the tertiary zones have a compensatory influence on their work. This relationship between the principal, hierarchically organized cortical zones in the adult led Vygotsky to the conclusion that in the late stage of ontogeny the main line of their interaction runs "from above downward", and that the work of the adult human cerebral cortex reveals not so much the dependence of the higher zones on the lower as the opposite - dependence of the lower (modally specific) zones on the higher. The relationships between these primary, secondary and tertiary cortical zones composing this system do not, of course, remain the same, but change in the course of ontogenetic development. In the young child, as has been shown, the formation of properly working secondary zones could not take place without the integrity of the primary zones which constitute their basis, and the proper working of the tertiary zones would be impossible without adequate development of the secondary (gnostic) cortical zones which supply the necessary material for the creation of major cognitive syntheses. A disturbance of the lower zones of the corresponding types of cortex in infancy must therefore lead inevitably to incomplete development of the higher cortical zones and, consequently, as Vygotsky (1934; 1960) expressed it, the main line of interaction between these cortical zones runs "from below upward." (Luria 1973, p. 74-75).

In both Vygotsky's and Luria's accounts of the human mind the importance of language cannot be underestimated. For them, language serves as an immensely powerful system of tools (levers) which multiplies our ability to process the world:

"The word adds another dimension to the world of humans. It enables them to deal with things without having to have those things present. Animals have one world, the world of objects and situations which can be perceived by the senses. Humans have a double world. Furthermore, humans can elicit these images at will even in the absence of the objects. As a result, humans not only can regulate their perception, they can also regulate their memory by using images. They can control their actions. That is, to say, words give rise not only to a duplicate world, but also to a form of voluntary action which could not exist without language." (Luria 1988, p.35).

In Luria's scheme, this second signalling system, extraordinarily richer than that conceived of by Pavlov, is viewed as being implemented within a spatio-temporal topology in the brain the operation of which is very different (inverses) in child and adult cognition:

"Historically formed measures for the organization of human behaviour tie new knots in the activity of man's brain, and it is the presence of these functional knots, or, as some people call them, "new functional organs" (Leontiev, 1959), that is one of the most important features

distinguishing the functional organization of the human brain from an animal's brain. It is this principle of construction of functional systems of the human brain that Vygotsky (1960) called the principle of "extracortical organization of complex mental functions", implying by this somewhat unusual term that all types of human conscious activity are always formed with the support of external auxiliary tools or aids. The second distinguishing feature of the "localization" of higher mental processes in the human cortex is that it is never static or constant, but moves about essentially during development of the child and at subsequent stages of training. This proposition, which at first glance may appear strange, is in fact quite natural. The development of any type of complex conscious activity at first is expanded in character and requires a number of external aids for its performance, and not until later does it gradually become condensed and converted into an automatic motor skill." (Luria, 1973, p. 30- 31).

Let us consider an example of a neuropsychological topology which, according to Luria, shifts during development. Luria applied a psycholinguistic analysis to the effects of localized brain lesions in humans. He concluded that frontal lesions affect the genesis of motives and needs, the planning and carrying out of purposeful organized activity. More specifically these patients manifested inertia, inflexibility, stereotypic repetition, echolalia and echopraxia, stimulus-boundedness, passivity, distractibility, irrelevancy, narrowing of the predicative structure of speech (or telegraphic style), and loss of kinetic melody and flow of intonation and other aspects of complex motor programs. In short, the "syntagmatic" function (Jacobson) was impaired. Patients with postero-rolandic brain lesions manifested a quite different problem. Luria concluded that these patients had an impairment of the phonological, lexical and logical-grammatical codes of language. More specifically they manifested paraphasia, semantic and amnesic anomia, aphonemia, agrammatism, and spatial agnosia. In short, the paradigmatic function (Jacobson) was impaired. We have seen that in Luria's account of normal development syntagmatic operations precede and develop into paradigmatic operations. However, in his account of the effect of adult lesions, he theorizes that syntagmatic operations are the highest control functions of the entire cognitive apparatus:

"The frontal lobes (forming the third functional unit) are the essential apparatus for organizing intellectual activity as a whole, including the programming of the intellectual act and the checking of its performance." (Luria 1973, p. 340).

This apparent contradiction, unsolved in Luria's writings, could have been solved if Luria had taken account of the dialectic of "concrete" and "abstract" in a Marxist framework.

Implementation of phylic, ontogenetic, and historical content within the human mind

This 3-way nexus, as viewed by the cultural-historical school of psychology can be summarized as follows: The human being is born an ape with genetically programmed potential for humanity. This humanity is imparted to him first in his relation to nurturing adults and secondly in his larger social relations. The cognitive implements of civilization have evolved historically primarily under the impulse of adult labor. These implements are appropriated and objectified (Leontyev, 1978) initially by the child in social exchange. The individual adult eventually may make an original cognitive contribution to the advance of civilization by means of the "ascent to the abstract".

Reflexions on what is wrong with the cultural-historical school's account of the abstract concrete dynamic

The failure of Vygotsky, Leontyev and Luria to clearly formulate the abstract-concrete dialectic is not only understandable, it was overdetermined. This dialectic is not explicit in any of Marx's writings. It is a difficult set of concepts to master. It acquires its full significance only in its most evolved presentation, namely the genesis of advanced creative scientific theory.

The founders of the cultural historical school of psychology approached but never reached a preoccupation for the genesis of advanced creative scientific theory. In fact, they never went beyond investigation of acquisition of (individual) basic scientific concepts. Vygotsky was too busy investigating encapsulated mental operations of children to deepen his metatheoretical understanding of the fullest and highest open forms of mentation. Leontyev was preoccupied with the genesis of action, and of the impacts of motives, needs, personality and social exchange on these, and never really focussed on higher cognitive operations. Luria followed very closely Vygotsky's developmental research program and then switched to the investigation of the effects of brain lesions - hardly the appropriate forum for addressing issues of the very highest cognitive operations of advanced theorists.

But this apology having been made, the consequences of these shortcomings remain nevertheless extremely detrimental for the general theory of the cultural-historical school because they led to theoretical errors.

The first major error consists of hypostatizing language. Language is not a mental operation in and of itself. The brain codes symbols and rules and operates on these by means of the intertwining of true cognitive operations such as perception, imaging, attention, memory and action structures. In short, Leontyev was correct to state that the essential cognitive operation is activity (Tätigkeit). Emphasis on explicit language (and even on overly formalized notions of inner language) in the interpretation of the workings of the mind yields powerful insights but also faces dangerous pitfalls such as overly abstract, formal interpretation of encapsulated change.

The second major error consists of ignorance of the importance of practice not only in social exchange but in cognitive ontogeny as well. Again Leontyev can least be accused of this shortcoming. He did not however apply his rich notion of practice to higher mental operations. The child does not, as Vygotsky and Luria seem to have believed, acquire cognitive content primarily through verbal exchange, but through motivated practical activity based on needs. The child appropriates language to accomplish and acquire things rather than the reverse (Leontyev, 1981, p. 220).

The third major error is the insufficient attention paid to the content of mental operations over the form. Once again here Leontyev was the least culpable, perhaps though to an extreme. Leontyev's activity theory is all content and has no form. Vygotsky and Luria on the other hand, though they did note, as we have seen, that what they consider to be "ascension" to the abstract, crashes in confrontation to new content, failed to fully draw the key implications and missed the opportunity to design the most important research which would have shown that the lineage of cognitive development in its fullest sense comprises an elaboration of content just as well as of form.

Conclusion: what needs to be done both in terms of new empirical investigation and theoretical restructuring to improve activity theory?

Activity theory now needs to embark upon a new phase of its development. The theoretical questions which must be posed are: How does ascension to the concrete occur? How do the historical, logical, and psychological trajectories intermesh in this process? How do the various forms of practice (concrete activity) evolve phylogenetically, ontogenetically and historically up to and including the very highest types of consciousness? The empirical

research program required to concretize this grand theoretical scheme is none other than the entire domain of science. More specifically however, psychologists should perhaps first tackle the long overdue problem of how advanced scientific thought develops in great scientists' lives and minds. Then we will be in a better position to deduce the multi-faceted trajectories which contribute to the development of lower to higher forms of cognition.

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