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It is only in a social context that subjectivism and objectivism, spiritualism and materialism, activity and passivity cease to be antinomies, and thus cease to exist as such antinomies. The resolution of the theoretical contradictions is possible only through practical means, only through the practical energy of man.

Karl Marx.

The Cultural-Historical Approach in Psychology: A Research Program?

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Introduction

Most philosophers of science have been rather reluctant to consider psychology a "real," mature science. Examples of this attitude can be found in the work of prominent philosophers such as Popper, Kuhn, and Lakatos. The implicit or explicit assumption in their writings seems to be that standard examples of rational scientific development are mostly to be found in the natural sciences. Time and again we meet the worn-out cases of Galileo's new mechanics, Newton's gravitational theory and Bohr's theory of the atom. Psychology and the humanities seem to fall short of standards of rationality taken from these periods of history in the natural sciences. Therefore, psychology is considered to be an immature, unscientific or "preparadigmatic" science.

One could, of course, criticize this harsh judgement by maintaining that it is not necessarily or conceptually true that psychology should be measured by the same standards as the natural sciences. This is not the approach we will follow, however. Instead we will accept the standards of rationality of one philosopher of science, notably Lakatos (1978), and show that at least one approach in psychology can live up to his requirements.

The purpose of this paper will be, then, two-fold: 1) to show the applicability of Lakatos' theory to an important approach in contemporary psychology, namely the cultural-historical theory, and to argue that this approach satisfies the demands Lakatos formulates for fruitful research programs. I believe that the same could be done for other psychological theories, e.g., Piaget's and Kohlberg's theories of cognitive and moral development. There seem to be no grounds to restrict the applicability of Lakatos' theory to the natural sciences; 2) to show that the application of Lakatos' theory in any science will meet with some difficulties. First, there is the problem of formulating what is considered to be the hard core of a research program. The choice of hard core items will inevitably depend on some debat-

able judgements. Second, one has to decide which time period should be used to formulate the hard core. Third, as an encore, the question will be raised whether Lakatos' concept of the hard core doesn't necessarily imply some sort of essentialism.

Vygotsky's Cultural-Historical Theory

The popularity of Vygotsky's cultural-historical theory (Vygotsky, 1962; 1978) is growing and several books offer a more or less complete description of its content and development (e.g., Kozulin, 1984; Van IJzendoorn & Van der Veer, 1984; Wertsch, 1981). Therefore, we will confine ourselves to the bare outlines of the theory and the history of its development.

In the late 1920's the Russian psychologist Lev S. Vygotsky (1896-1934) started to develop a theory of cognitive development. Together with his colleagues, Luria and Leont'ev, he formulated the so-called cultural-historical theory, which was meant to incorporate some of the basic concepts of Hegelian Marxist thought while at the same time doing justice to the results obtained by important researchers such as Bühler, Külpe, James, Piaget and others (Vygotsky, 1934 [1962]; 1978). One of the characteristic features of Vygotsky's theory was the distinction he made between "lower" and "higher" psychological processes. The latter were supposed to be typically human and based on the acquisition of cultural tools or instruments. Lower, "natural" psychological processes were supposed to be hereditary. They formed the raw material out of which the higher processes were formed. To give an example, some basic memory mechanisms are hereditary and common to both animals and human beings, e.g., the ability to recognize an object seen before. This, then, constitutes a lower psychological function. Typically human, however, is the use of mnemotechnic devices and language in remembering. These Vygotsky considered to be cultural instruments used to transform lower natural memory processes into a higher, "cultural" memory. The lower processes continue to play a role but become subordinated to higher goals. They are, in the words of one of Vygotsky's favorite philosophers, G.W.F. Hegel, "superseded" (*aufgehoben*). The cultural tools themselves also have a history. They have been developed by earlier generations and this history can be investigated by doing cross-cultural and archeological research.

Vygotsky's research plan was as simple as it was comprehensive: to study the acquisition of cultural tools and the transformation of lower psychological functions into higher ones; to study the historical development of cultural tools, and finally to study the most complex psychological tool, language, with respect to its formative role for human thought (Kozulin, 1984, p. 106).

It is clear for those acquainted with the philosophical and psychological issues of the 1920's that Vygotsky had a thorough knowledge of the research that had been done in this period. To give but a few examples: the distinction between lower and higher psychological processes had already been made by Wundt; the general anti-reductionistic trend in Vygotsky's writings and his emphasis on typically human vs. animal processes can be traced back to Engels' writings; the distinction between two types of memory is implicit in Janet's work; etc.

In retrospect we can say that Vygotsky's theory was a quite original attempt to tackle one of the oldest and most respectable problems of Western thought: the nature-nurture issue. After his death, his work was continued by his colleagues and pupils. Among his most influential followers were undoubtedly A. R. Luria, who contributed much to the development of neuropsychology, and A. N. Leont'ev who was to become well-known as the originator of the so-called activity theory (see Wertsch, 1981).

The hard core. After this short introduction to the cultural-historical theory it should be possible to formulate its Lakatosian "hard core". Careful reading of Vygotsky's writings suggests the following, mutually connected, statements.

- a) *It is necessary to distinguish between lower psychological processes, which have evolved in biological evolution and higher psychological processes, which are connected to cultural theory;*
- b) *Child development is the acquisition of cultural instruments, which transform the lower processes into higher ones;*
- c) *All higher psychological processes have a social origin, because the cultural instruments are acquired in a person-to-person interaction and*

because the instruments themselves embody social, cultural experience.

- d) *Cognitive development is not a process of gradual accumulation of knowledge, skills, etc., but a "dialectical" process of sudden transformations.*

It seems unlikely that a hard core formulated in this way could be attributed to some other theory of cognitive development, e.g., Piaget's theory. It thus seems to be successful in characterizing the cultural-historical theory as distinct from other psychological theories. But this is not enough of course. The hard core should be a set of assumptions, presuppositions, and beliefs shared by all participants in the research program. To answer the question of whether our description of the hard core of the cultural-historical theory is acceptable to all researchers involved, we will again dip into the history of this school of thought.

Vygotsky very much emphasized language as the most important cultural tool. Speech, in his opinion, transforms the mental functions of the child and therefore, ultimately, the child's consciousness. The acquisition of verbal concepts and symbols takes place during adult-child interaction. It is therefore understandable that Vygotsky was highly "interested in the internalization of symbolic tools and social relations," as writes Kozulin (1984, p. 107).

The tragedy of Vygotsky was that this point of view was quite unacceptable in the social climate of the 1930's. Vygotsky's point of view seemed to imply that children's consciousness is wholly determined by the consciousness of their parents. If our consciousness is determined by verbal concepts and these concepts are learned from more experienced members of a culture, then the danger of "idealism" looms large. It was not clear to critics where the material praxis came in, a praxis which had to play an important role in the formation of consciousness according to the standard dialectical-materialist doctrine. Although it clearly was possible to defend Vygotsky's point of view (see Kozulin, 1984, pp. 117-118; Van der Veer, 1985a), this was not what happened.

Shortly after the death of his colleague and teacher, Leont'ev dissociated himself from Vygotsky's ideas (Leont'ev, 1983). He accepted the criticisms of "idealism" and emphasized that one had to study the child's practical, material activity. Internalization was to be understood not as the transformation of symbolic tools and social relations into mental functions (Vygotsky), but as the transformation of external actions. Clear examples of this approach can be found in the work of Leont'ev's colleague P. Y. Gal'perin. Leont'ev's article meant the starting-point of the so-called Kharkov school (see Van der Veer & Van IJzendoorn, 1985; Wertsch, 1984) which would eventually lead to the above mentioned activity theory. It also meant the starting point of a controversy within the cultural-historical school which continues to this day (see Kovalev & Radzichovsky, 1985). From the theoretical point of view, we think that the switch from a Vygotskian emphasis on symbolic tools and social interaction to Leont'ev's emphasis on practical activity can be understood as a switch from Hegelian dialectical thought to Engels' more materialist writings (Van der Veer, 1985b).

The switch from Vygotsky to Leont'ev had important consequences for both empirical and theoretical investigations within the cultural-historical tradition. Does this imply that Leont'ev started a new research program? Do we have to formulate a new hard core? We do not think this is necessary if we stick to the description of the hard core as given above. But we could of course have supplemented this description by the typical Vygotskian statement.

e - Internalization is to be understood as the transformation of symbolic tools and social relations into psychological functions.

This would then be in clear contradiction to Leont'ev's statement that

e' - Internalization is to be understood as the transformation of practical, external actions into mental functions.

It is not clear how this problem can be solved. The solution partly depends on the time period one takes into consideration. If one considers a period from 1930 until now, then one will arrive at something as formulated above (the statements a-d). These are probably the assumptions shared by all researchers from this period. If, however, one concentrates on Vygotsky's period (until 1934) one could add statement e, which would then in a later period have to be replaced by e' (assuming for the sake of argument that they cannot be reconciled). The choice of statements pertaining to the hard core of a research program thus seems to depend partly on the time period taken into consideration.

Quite apart from these difficulties any attempts to formulate the hard core of a research program will always depend on some decisions which can be questioned. We would not be very surprised, for instance, if some cultural-historical researcher turned out to be not very attached to statement d. Some might deny that this rather "empty" statement is indispensable. Another illustration can be found in Wertsch (1981): In his description of Leont'ev's theory, he does not explicitly mention our statement a.

These, then, are some of the difficulties one meets in describing the hard core of the cultural theory. They do not seem, however, to be specific to the cultural-historical theory or to psychology in general. They are difficulties the philosopher of science has to face in any science; be it chemistry or psychology, physics or sociology.

Positive and Negative Heuristics: Assessment of a Research Program

Having formulated the hard core of the cultural-historical theory we can proceed with the description of the so-called positive and negative heuristics. The negative heuristic of a program is the demand that during the development of the program the hard core is to remain unmodified and intact. Any scientist who modifies the hard core has opted out of that particular research program. Lakatos (1978, p. 48):

The negative heuristic of the program forbids us to direct the *modus tollens* at this 'hard core.' Instead, we must use our ingenuity to articulate or even invent 'auxiliary hypothesis' which form a *protective belt* around this core, and we must redirect the *modus tollens* to these.

The positive heuristic of a research program indicates to the scientist how the hard core is to be supplemented in order for it to be capable of explaining and predicting real phenomena. It consists of a set of suggestions, hints and guidelines on how to modify or sophisticate the protective belt. Lakatos states that the principles expressing the positive heuristic are of a flexible, metaphysical nature (Lakatos, 1978, p. 51).

Clear examples of positive and negative heuristics can be found in the history of the cultural-historical school. Statement c from the hard core, for example, clearly implies some suggestions and hints for empirical research. The assumption that "all higher psychological processes have a social origin, because cultural instruments are acquired in person-to-person interaction" implies that schooling (teaching), being a particular form of social interaction, can play a role in the development of higher psychological processes. This means that participants in a cultural-historical research program will try to develop curricula to promote cognitive development. The work of Davydov and Gal'perin testifies to this attitude (cf. Davydov, 1972; Gal'perin, 1980). The tenacity of these researchers in developing curricula and their optimism in the face of setbacks can be explained in view of the fact that this type of research is intimately connected with, and implied by, the hard core of their research program. It is part of the positive heuristic. On the other hand, if a child performs badly on a task requiring cognitive functioning, the cultural-historical researcher should not, at first, look for hereditary and/or physiological factors (such as minimal brain damage). Such a strategy would clash with the hard core assumptions as described above. First and foremost one should look for earlier social interaction patterns to explain the child's inferior performance. It is rational to do so as long as the research program bears fruit.

We may rationally decide not to allow 'refutations' to transmit falsity to the hard core as long as the corroborated empirical content of the protecting belt of auxiliary hypotheses increases (Lakatos, 1978, p. 49).

Chalmers (1982, p. 84) mentions two ways in which the merit of a research program is to be assessed. Firstly, a program should possess a degree of coherence that enables the mapping out of a definite program for future research. Secondly, a research program should lead to the

discovery of novel phenomena at least occasionally. It does not seem difficult for the cultural-historical theory to satisfy these demands. The high degree of coherence of the theory can be shown in a few words. The hard core, to begin with, consists of a set of intertwined assumptions. Statements b and c presuppose statement a, statement d is connected with b, etc. In the above we have shown how the positive and negative heuristics are implied by, and connected to, the hard core of the program. Hard core and heuristics taken together lead to a program for future research, which we described in Van IJendoorn and Van der Veer (1984, pp. 96-98). The second demand, that the program should, at least occasionally, lead to the discovery of novel phenomena, has also been met repeatedly. As examples of research leading to the discovery of novel facts we would suggest, for example, the research into literacy (see Scribner & Cole, 1981) and Luria's neuropsychological research (see Luria, 1973).

To summarize, we have shown that it is possible to formulate the hard core of cultural-historical theory as well as the positive and negative heuristics. We have further suggested that the theory can satisfy Chalmers' additional demands of coherence and fruitfulness. This implies that the cultural-historical theory can be considered a Lakatosian research program. At the same time it has been shown that the application of Lakatos' ideas is not without problems. The formulation of the hard core and the choice of the historical period taken into consideration will rest on certain debatable grounds.

Discussion

The main purpose of this paper was to show the applicability of Lakatos' theory to one of the most important approaches in contemporary psychology. Our demonstration has of course been rather brief and we understand that a really convincing case requires a detailed description of all the ins and outs of the historical development of the cultural-historical research program. A first approximation of such a description can be found in Van der Veer (1985b). We believe, however, that we have given some arguments in favor of the thesis that the cultural-historical approach should be considered a Lakatosian research program. It seems likely that other important theories in

psychology can also meet Lakatos' conditions. As a first candidate we would suggest the Genevian school of cognitive psychology, developed by Piaget. Like the cultural-historical theory, this approach has a respectable history and it led to a wealth of novel facts.

Another purpose of this paper was to show some difficulties connected with the application of Lakatos' theory in any science, be it psychology or physics. They do not seem to invalidate Lakatos' approach, but show that any philosophical-historical analysis of scientific developments presupposes a point of view, which influences the results. One can of course question Lakatos' approach itself. The conception of a "hard core" as a set of immutable assumptions and beliefs, for example, is not without difficulties. It rests on the assumptions that the resemblance of theory variants $T_1, T_2, \dots, T_n$ is based on some common set of statements. This is not necessarily true, as Wittgenstein showed with his notion of "family concepts." One could, in other words, see the development of a research program as a process of organic growth, in which the last theoretical product does not necessarily resemble the first, and which theoretical products are not necessarily compatible with some shared set of assumptions. This would mean that one avoids essentialism and allows for some modification of hard core assumptions without immediately drawing the conclusion that the researcher has totally opted for a different research program. Perhaps such a point of view would be able to handle more examples of theoretical traditions than a "rigid" Lakatosian approach. This is only an afterthought, however, and we leave it as a suggestion to the reader. In this paper we accepted Lakatos' point of view and showed its applicability to cultural-historical theory and some of its problems.

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Man lives with things mainly, even exclusively-- since sentiment and action in him depend upon his mental representations--as they are conveyed to him by language. Through the same act by which he spins language out of himself he weaves himself into it, and every language draws a circle around the people to which it belongs, a circle that can only be transcended in so far as one at the same time enters another one.

Wilhelm von Humboldt

The Zone of Proximal Development in Eighth Grade Social Studies

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Since 1910, study after study has described recitation as the dominant pattern of teacher-class interaction (Hoetker & Ahlbrand, 1969). Recitation may test students' existing knowledge but it does not teach. It is rapid paced, with as many as five questions per minute. Students are commonly given only a brief time to answer before a question is repeated or re-directed to another pupil. The emphasis is on lower-level facts and ideas, literal detail, and the already known. Teachers often do not use follow-up questions; they do not engage in Socratic give and take to assist students to understand at a higher level, or to express their ideas in a more complete form. There is little attention to comprehension at the level of cause-effect reasoning, interpretation, or inference, nor is the tentative and problematic nature of understanding a given text acknowledged. Teachers act as if students should understand and apply ideas on their own. Vygotsky's (1978) ideal of teaching as assisted performance in the zone of proximal development (ZPD) is rarely achieved.

Such restricted patterns of teacher-class interaction were observed in a junior high school serving an urban, Latino community. Hyland (1984) spent many months in this particular school conducting an observational study of eighth grade social studies instruction. Among other findings, he reported that recitation was the dominant form of teacher-class interactions. For example, teaching of the U.S. Constitution in all achievement groups consisted of an emphasis on simple facts about the document and its authors. Virtually no attempts were made to foster, through teacher-guided discussion, students' understanding of the principles of American democracy or the application of these principles to his-