

### ***Vygotsky's Theory of the Higher Psychological Processes: Some Criticisms***

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**Abstract.** *Vygotsky's* cultural-historical theory is discussed, especially the distinction between lower and higher psychological processes. The distinction is criticized, based in part on discussions in Soviet psychology. In particular, it is shown that *Vygotsky* separated the lower and higher psychological processes too sharply, and that his conception of lower processes as 'natural' and 'passive' is false. The authors suggest that these shortcomings can be overcome within the cultural-historical framework. *Vygotsky's* theory is not only of historical value, but continues to play a role in contemporary psychology.

There is a growing interest in the works of the well-known Soviet psychologist *Lev Semjonovich Vygotsky* (1896-1934). In the 1920's *Vygotsky* together with *Leont'ev* and *Luria* developed a thoroughly new conception of many important psychological problems. The core of his writings is the so-called socio-historical or cultural-historical theory of the development of higher psychological processes. In this article we discuss the distinction *Vygotsky* drew between lower and higher processes. The distinction has been criticized by Soviet psychologists working in the tradition of the socio-historical theory.

The main criticism is that *Vygotsky* created a dichotomy between the lower and higher processes due to an inadequate conception of the lower psychological processes.

#### **Higher Psychological Processes**

##### *Phylogenesis: Labor*

The distinction between lower and higher psychological processes had been made prior to *Vygotsky*. For instance, *Oswald Külpe* and *Wilhelm Wundt* had already written about this distinction. *Wundt* distinguished the

psychological and the historical methods of research. The latter he reserved for research into the higher psychological processes, which to him were those processes for which parallel physical processes had not yet been discovered. These were learning, thought, memory, volition, etc. The psychology concerned with studying these processes *Wundt* called 'Völkerpsychologie'. To him, it was impossible to study these processes experimentally. They would be studied indirectly, for example, by describing the historical development of language, with the morals, habits, rights, and religions of people to be found in it.

*Vygotsky's* approach is quite different. In the first place he thought that the higher psychological processes could be studied experimentally. In the second place he developed a quite original view on the distinction between lower and higher psychological processes, consistent with Marxist classics. In order to understand how higher psychological processes developed, we must consider phylogenesis. *Hegel*, *Marx*, and *Engels* had commented upon it on several occasions. Having integrated these comments, *Vygotsky* developed the following view on human development: at first, the species developed according to the laws of biological evolution as formulated by *Charles Darwin* in 'The Origin of Species'. All elementary psychological processes, such as nonverbal thinking, eidetic memory, etc., developed during this evolution. They form the foundation of human behavior. But it is not these processes that make the human being. They are shared by humans and animals alike [*Vygotsky*, 1977; 1982a; 1982b]. The genuinely human processes, that is, the higher psychological processes, cannot be explained by this biological evolution. They are cultural in origin. At a

particular point, the biological development turned into a historical development<sup>1</sup>.

As did *Hegel*, *Marx*, and *Engels*, *Vygotsky* sets the beginning of this historical development at the time when people began to work cooperatively. Work involving division of labor leads to new forms of behavior that are no longer determined by direct instinctive goals. *Luria* [1979] gives the example of planting seeds of grain. From the point of view of immediate satisfaction of physical needs, this is nonsense, but from the point of view of intentional, systematic labor, it is an extremely useful activity. Through work people control nature and create the conditions for their own development through purposeful, systematic changes. Moreover, this work is 'mediated', as opposed to the 'unmediated' activity of animals. *Vygotsky* draws a direct parallel between the use of a tool in labor and the use of a sign in thinking or remembering. Elementary forms of behavior presuppose a direct reaction to the task set before the organism, which can be expressed by the simple S-R formula. Basic to all higher psychological processes, however, is mediation, that is, the use of some intervening instrument or tool between stimulus and response. For example, when one ties a knot in a handkerchief as a reminder, one is constructing the process of memorizing by forcing an external object to remind one of something. In elementary forms of memory something is remembered; in the higher form humans remember something by the use of a sign [see *Vygotsky*, 1978; 1983].

<sup>1</sup> During this historical development, human biological evolution perhaps continues, but in any case too slowly to be observed. Practically speaking it can therefore be said that biological development is followed by historical development.

Because people create their own environment, which in turn determines their development, they are, with regard to historical development, their own creators. Here we have an example of *Vygotzky's*, and, more generally, Soviet psychology's optimistic view of the potential of humans. It is within this historical development that the higher psychological processes, such as abstract thinking and speech, develop.

*Vygotzky* saw the following indications of the validity of his theory of the development of higher psychological functions. First, research indicated that the elementary reactions of primitive and civilized people are alike [*Vygotzky*, 1960; *Bozhovich*, 1977]. Second, higher psychological processes, thought in particular, differ markedly between primitive and civilized people. How can we explain this difference? It cannot be said that the physiological substratum differs, for the elementary processes are the same. According to *Vygotzky*, this means then that cultural causes are responsible for the differences in thought.

#### *Phylogenesis: Speech*

We have seen that, following *Vygotzky*, in phylogenesis the change from animal to human occurred when people began to work cooperatively and systematically. However, a second factor which was as much to determine the distinction between animal and human is the development of speech. In the process of division of labor, the necessity to associate with one another, to describe certain work situations, leads to the development of speech. According to *Luria* [1979], we must imagine this process approximately as follows: At first, primitive people made only undifferentiated sounds closely related to gestures and practical work situations. The meaning of the sound was very dependent on the situation. Gradual-

ly, however, a whole system of differentiated codes developed. The development of these codes (signs in *Vygotzky's* terminology) was of great importance to the development of consciousness. Indeed, at first people were strongly tied to practical situations and reacted to stimuli from the immediate surroundings. When the code- or sign-systems developed, it became possible to think about situations that were not directly perceptible. The sign (e.g., the word) refers to an occurrence or matter that does not have to be perceptible at the time. People could thus go beyond the boundaries of sensory experience. Through this, abstract thought became possible. One could say that without work and language there would be no abstract thought.

If the above is true, then it follows that we must look for the sources of abstract thought and other higher processes not in the individual, but outside the individual, namely, in the cultural forms of historical development. *Vygotzky*: 'There is not the slightest bit of hope of finding the origins of purposeful action in the height of the intellect or in the depths of the brain. The idealistic path of the phenomenologist is as hopeless as the positivistic road of the naturalists. To find the origins of purposeful action, one must transcend the limitations of the organism. The source of human consciousness and freedom should not be sought in the internal world of the intellect, but in the social history of mankind. To find the soul, we must abandon it' [*Vos*, 1976].

#### *Ontogenesis: Internalization*

But how do the higher psychological processes develop during child development? In child development 'natural' and cultural developments coincide and interact in complex ways. On the one hand, certain elementary,

biological processes develop during ontogenesis through maturation. On the other hand, the higher psychological processes develop in the child through his or her association with adults, acting in accordance with culture. To *Vygotsky*, these two lines of development are fundamentally different and can actually be distinguished. Especially in the first 3 or 4 years of life there can be found more or less 'natural' processes. In his study on the development of attention he writes: 'We call this entire period in the development of the child the period of natural or primitive development ... because the development of attention in this period is a function of the general organizational development of the child - above all, the structural and functional development of the central nervous system. The development of attention in this period is based purely on the organic processes of growth, maturation, and development of the neurological apparatuses and functions of the child' [*Vygotsky*, 1979].

*Vygotsky's* account of the development of the higher psychological processes is as follows. The child grows up in a society and a culture in which sign systems are already available. Children acquire these sign-systems through their interaction with adults and through education. To *Vygotsky* the notion of social interaction ('obšenie') means two things. There is immediate interaction, which we have with young children. This interaction manifests itself in cuddling and touching, that is, in affective reactions. This form of social interaction changes, however, to mediate(d) social interaction as soon as the child is able to use signs. Though this mediate(d) social interaction develops from immediate social interaction, due to the use of signs, it has a character all of its own. It is within this mediate(d) social interaction that

the internalization process takes place. To illustrate this concept, which has been described more thoroughly elsewhere [*Vygotsky*, 1978; *Wertsch*, 1979], we will give an example borrowed from *Luria*. Imagine that we wish to know how children learn to jump consciously. We cannot direct this process in little children. Now and then the child jumps and that is all. The mother is not yet able to elicit the behavior. But at a particular point the child becomes able to jump when the mother requests it. The mother says 'jump' and the child jumps. The child then makes use of an external stimulus. A bit later in his or her development, the child is able to say the word 'jump' himself or herself, and so to direct his or her behavior. Finally, the child only thinks of the word and voluntary, independent behavior begins. In the preceding (somewhat absurd) example, the following occurred, according to *Vygotsky*. First, there was a social, interpsychological ('intersichičeskij') relationship between mother and child, in which an external stimulus (the word 'jump') induced a certain action. From this, the individual, intrapsychological process began, in which the child, as it were, gives itself a task with the help of a word. Children's talking to themselves is derived from interpsychological talking. It can also be put in another way. Besides its communicative function, language also has a guiding, regulating function. From this regulating function self-regulation develops, the direction of one's own behavior<sup>2</sup> [*Zivin*, 1979; *Van IJzendoorn and Van der Veer*, 1984].

<sup>2</sup> This is in contradiction with *Piaget's* 'autistic speech' theory. *Vygotsky* criticized *Piaget's* 'Le langage et la pensée chez l'enfant' and 'Le jugement et le raisonnement chez l'enfant'. *Piaget* reacted to *Vygotsky's* criticism in his 'Comments on *Vygotsky's* critical remarks' [1962].

With this principle of the internalization of social actions, which was to induce a great amount of research, *Vygotsky* joined the dialectical materialistic tradition in the human sciences. The concept of internalization is, indeed, a direct assimilation of *Hegel's* concept of 'Verinnerlichung'. *Hegel* also considered the development of language a means by which the child internalized the culture of society. *Hegel* also spoke of the role of signs (tools) and the importance of social interaction in child development. In addition, *Vygotsky* believed that he was linking up to the ideas of *Marx*. To illustrate, he quotes the sixth thesis on *Feuerbach* and changes it as follows: 'Altering *Marx's* well-known statement, we could say that man's psychological nature is the ensemble of social relations, which have been internalized and become functions of the personality and forms of its structure...' [*Vos*, 1976]. To *Vygotsky*, the importance of society for the development of individual consciousness had in this way been demonstrated.

### Soviet Criticism

Now that we have sketched *Vygotsky's* theory of the phylogenetic and ontogenetic origins of higher psychological processes, we can discuss the distinction he made between lower and higher psychological processes in more detail. By higher processes *Vygotsky* understands, for instance, 'logical memory', 'creative imagination', 'verbal thinking'<sup>3</sup> and 'regulation of actions by will'. As examples of lower processes he mentions 'direct percep-

tion', 'involuntary memory', and 'preverbal thinking'. We have seen that the main distinction between lower and higher psychological processes is that the latter are mediated by signs and social in origin. They are the result of social interaction between child and adult. However, now and then, *Vygotsky* characterizes the lower psychological processes as 'natural' and the higher psychological processes as 'cultural'. In other words, he seems to imply that the influence of culture on the mental development of the child is brought about only by social interaction. Later Soviet researchers have tried to avoid this reductionism by pointing out that the child is also actively interacting with objects and surroundings influenced by culture [*Brushlinsky*, 1967, 1979; *Bozhovich*, 1977; *El'konin*, 1966; *Tikhomirov*, 1961; *Zaporozhets* 1966; *Zaporozhets and El'konin*, 1979]. Through this interaction the child acquires knowledge about his or her environment, and this interaction influences the development of psychological processes, which *Vygotsky* considered 'natural'.

### The Kharkov School

Particularly important in this connection is the research of the so-called Kharkov school of developmental psychology. This school consisted of a number of psychologists under the leadership of *Leont'ev*, who tried to develop the sometimes schematic ideas of *Vygotsky* (other well-known members of the group were *Zaporozhets*, *Bozhovich*, *Gal'perin*, and *P.I. Zinchenko*). The researchers of this school emphasized the active character of the lower, unmediated psychological processes. They stressed the concept of action ('*deystvie*'). All psychological processes are considered to be based on external actions ('*predmetnoe deystvie*').

<sup>3</sup> This is our translation of 'rečevoe myšlenie', which literally means 'speech thinking'. The word 'reč', which means 'speech', has also sometimes been translated as 'language'.

Viewed at any given time, the child's mental processes are the result of the history of his or her interactions with the social and nonsocial environment, on the basis of which he or she evolved a large set of specific adaptations that operationalize relations among objects and people that the child encounters [Cole, 1979/1980].

According to Zaporozhets [1966] we have here a new conception of psychology: psychological activity develops on the basis of practical activity, on the basis of the orienting and regulating processes connected with this activity. Asnin, for example, a member of the above-mentioned Kharkov school, tried to demonstrate the importance of activity as follows [Asnin, 1979/1980]. He showed 'that a generalization occurs in the process of the subject's concrete activity as the result of transfer of a procedure acquired in performing one task to the condition of a new and different task'. Subjects were presented with a series of problems of increasing complexity. It was shown that by working actively through the whole series of problems, children are able to solve even the most difficult ones. On the other hand, if the passive child is shown in the initial phase of the experiment how to solve a particular problem, he or she can imitate this problem-solving method, but cannot generalize it to a more difficult problem. Asnin concludes that neither instruction nor accumulated experience alone leads to generalization; experience must be appropriately organized for a generalization to be formed. 'For this, the subject must be active relative to the objective reality present under the particular conditions ... By trying the problem in our series, using similar methods to solve them and then transferring these methods to new problems, making mistakes in the process and correcting them, the

subjects arrived at a generalization that enabled them to solve a problem they previously had been unable to solve.'

#### *Perceptive Acting*

The main feature of this and other experiments carried out by the Kharkov school is the insistence on continuing interaction with the culturally determined environment. Zinchenko, another member of the Kharkov school, demonstrated in a series of experiments that the conception of visual perception as a passive registration of stimuli must also be considered obsolete. Nowadays, Soviet psychologists consider perception to be perceptive acting ['perceptivnye dejstviya']. The reason is that a much more important role for the effector components of perception has been demonstrated. Already in the first months of life the activity of the child, based on orienting reactions, is very large. As Zinchenko demonstrated, the lower processes are of an active nature, and they actually do change in ontogenesis [Zinchenko and Vergiles, 1969; Zinchenko and Ruzskaya, 1959]. Children of different age levels, who are asked to look at a certain object, show different patterns of eye movements. Zaporozhets argues that these patterns are not the result of maturational processes. According to him these findings indicate that in ontogenesis perceptive actions develop. These actions have a specific, unique structure as a result of the mastering ('usvoenie') by the child of society's sensory experience [Zaporozhets, 1966, 1969]. The processes which were considered by Vygotsky 'lower' or 'natural' (e.g., 'direct perception') thus are not of a passive nature. Zaporozhets suggests that Vygotsky proposed his faulty conception of lower psychological processes because he himself did not investigate them. In that way,

he had to rely on the common notion of lower processes 'as natural reactions of the organism' which only change through maturation.

#### *Preverbal Interaction*

We have thus seen how *Vygotzky* erroneously restricted the influence of culture to social interaction, that is, the association of the child with adults. A second objection made by Soviet psychologists is that *Vygotzky* restricted the influence of social interaction to speech. For example, in his study on the development of higher forms of attention in childhood he writes: 'His or her attention is, as it were, in a state of neglect, it is not directed, it is not captivated and regulated by the speech of adults as in the attention of the normal child. In a word, it is not acculturated' [*Vygotzky*, 1979]. This restriction of the role of social interaction to the role of speech has, once again, the consequence that psychological processes, in which no speech factors are involved, are considered 'natural' or 'biological'. Recent research [*Lewis and Freedle*, 1973; *Bruner*, 1975; *Bullowa*, 1979] has, however, demonstrated that mother-infant interactions in the preverbal phase of life are of fundamental importance for the development of verbal communication. Mother and infant appear to communicate quite well without words and to go through different phases of interaction. The infant is an active participator in this interaction process [*Trevarthen*, 1977; *Newson*, 1979; *Brazelton et al.*, 1974]. These patterns of interaction afterwards become associated with words, possibly in the way described by *Bruner* [1975]. In a still later phase, the words can be used as commands. There thus seem to be several important phases of social interaction between the child and adults, before the process

which *Vygotzky* described as internalization starts. By emphasizing the role of speech *Vygotzky* neglected these developmental periods, considering them 'passive' and 'natural'.

#### *Dichotomy*

Although *Vygotzky* in his many works was not always consistent, and although he sometimes demonstrated that he realized some of the difficulties we pointed out, there remain some shortcomings in his work, as we have tried to show. It is understandable that several Soviet psychologists criticize *Vygotzky* for having separated too sharply the lower and higher psychological processes. *Brushlinsky* [1967], in a penetrating study, even concluded that *Vygotzky* is guilty of constructing a dualism. Depicting the lower processes as quite passive and biological in nature, and stressing the verbal (speech) character of the higher psychological processes, *Vygotzky*, the untiring opponent of methodological dualism, remained an ontological dualist himself, according to *Brushlinsky*. We must realize, however, that in a truly *Vygotskian* account of child development some principal distinction between lower and higher processes should be retained. After all, he was trying to develop a dialectical approach, in which development is seen as a series of qualitative transformations. In such an approach the higher psychological processes are not reducible to lower ones, but have a character of their own.

With the introduction of the concept of activity, later Soviet researchers tried to strengthen *Vygotzky's* socio-cultural theory [see *Wertsch*, 1981]. It is interesting to see that, in this way, the attention switches from speech to that other fundamental factor in the phylogenesis of man: labor. As we have seen, Marxist classics consider speech and

labor the two factors that made people really human. *Vygotsky* emphasized the role of speech. His followers emphasize the role of activity, which they consider to be a form of labor. In doing so, they avoid the 'idealism' for which *Vygotsky* was criticized in the 1930's. If culture is transmitted from parent to child through language, without the intervention of an objective reality, the origin of the development of the psyche is then seen as the result of the interaction of subject and subject, rather than as the result of the interaction between subject and object. This would run contrary to the anthropology formulated by *Marx* and *Engels* [see *Rahmani*, 1973]. In Soviet psychology philosophical tenets and empirical research are intimately connected.

### Conclusions

We have seen that *Vygotsky* depicted the lower psychological processes as passive and natural, which has been refuted by later research. As a consequence, the sharp distinction *Vygotsky* drew between lower and higher processes has been criticized. Several Soviet authors [*Brushlinsky*, 1979; *El'konin*, 1966; *Zaporozhets*, 1966] have pointed out that the modern Soviet conception of the nature of the lower and higher processes is, actually, more in agreement with *Vygotsky's* general socio-cultural theory than the above-criticized notions. Whether the theory can indeed assimilate these criticisms without distorting its basic tenets remains to be seen. Meanwhile, the relevance of the debate about the lower and higher psychological processes is clear. If it can be demonstrated that even processes generally thought to be 'natural' or 'hereditary' are influenced by culture, then there

is in principle a possibility to direct the development of these processes. That this is a real possibility has been demonstrated by the work of *Leont'ev* [1969] on the training of auditory ability and, lately, by *Podol'sky* [1978] (a student of *Gal'perin*) in his monograph on the simultaneous identification of simple, geometrical stimuli<sup>4</sup>. We may conclude, therefore, that the (adjusted) socio-cultural theory of *Vygotsky* continues to be a fruitful research program.

### References

- Asnin, V.A.: The development of visual-operational thinking in children. *Soviet Psychol.* 18: 23-36 (1979/80).
- Bozhovich, L.J.: The concept of the cultural-historical development of the mind and its prospects. *Soviet Psychol.* 16: 5-22 (1977).
- Brazelton, T.B.; Koslowski, B.; Main, M.: The origins of reciprocity: the early mother-infant interaction; in Lewis, Rosenblum, The effect of the infant on its caregiver (Wiley, London 1974).
- Bruner, J.S.: The ontogenesis of speech acts. *J. Child Lang.* 2: 1-19 (1975).
- Brushlinsky, A.V.: Die «Kulturhistorische Theorie» des Denkens; in Kossakowski, Untersuchungen des Denkens in der Sowjetischen Psychologie (Volk und Wissen, Berlin 1967).
- Brushlinsky, A.V.: The interrelationship of the natural and the social in human development. *Soviet Psychol.* 17: 35-52 (1979).
- Bullowa, M. (ed.): Before speech. The beginning of interpersonal communication (Cambridge University Press, Cambridge 1979).
- Cole, M.: Introduction. *Soviet Psychol.* 18: 3-8 (1979/80).

<sup>4</sup> *Podol'sky* [1978] was able to show that subjects can be taught, after a suitable training period, to detect simultaneously two objects. By 'simultaneously' he means detection in one fixation. *Podol'sky* demonstrated that the pattern of eye movements is controlled by the type of training.

- El'konin, D.B.: Problema obučeniya i razvitiya v trudach L.S. Vygotskogo. *Vop. Psichol.* 6: 33-41 (1966).
- Leont'ev, A.N.: On the biological and social aspects of human development: the training of auditory ability; in Cole, Maltzman, *Handbook of Soviet psychology* (Basic Books, New York 1969).
- Lewis, M.G.; Freedle, R.: Mother-infant dyad: the cradle of meaning in communication and affect; in Pliner, Kramer, *Language and thought* (Academic Press, New York 1973).
- Luria, A.R.: *Jazyk i Soznanie* (Izd. Mosk. Univ., Moscow 1979).
- Newson, J.: The growth of shared understandings between infant and caregiver; in Bullowa, *Before speech. The beginning of interpersonal communication* (Cambridge University Press, Cambridge 1979).
- Piaget, J.: Comments on Vygotsky's critical remarks (M.I.T. Press, Cambridge 1962).
- Podolsky, A.J.: *Formirovanie simul'tannogo opoznaniya* (Izd. M.G.U., Moscow 1978).
- Rahmani, L.: *Soviet Psychology: Philosophical, theoretical, and experimental issues* (International Universities Press, New York 1973).
- Tikhomirov, O.K.: Obščestvenno-istoričeskij podchod k razvitiyu psichičeskoj dejatel'nosti čeloveka. *Vop. Filos.* 12: 144-147 (1961).
- Trevarthen, C.: Descriptive analyses of infant communicative behavior; in Schaffer, *Studies in mother-infant interaction* (Academic Press, London 1977).
- Van IJzendoorn, M.H.; Van der Veer, R.: Main currents of critical psychology; in Vygotsky, Holzkamp, Riegel (Irvington, New York 1984).
- Vos, J.: *Onderwijswetenschap en marxisme. De methodenstrijd in de sovjetonderwijswetenschap* (Tjeenk Willink, Groningen 1976).
- Vygotsky, L.S.: *Razvitie vyššich psichičeskich funkcij* (Izd. APN RSFSR, Moscow 1960).
- Vygotsky, L.S.: The development of higher psychological functions. *Soviet Psychol.* 15: 60-73 (1977).
- Vygotsky, L.S.: *Mind in society. The development of higher psychological processes* (Harvard University Press, Cambridge 1978).
- Vygotsky, L.S.: The development of higher forms of attention in childhood. *Soviet Psychol.* 18: 67-115 (1979).
- Vygotsky, L.S.: *Sobranie sočinenij. I. Voprosy teorii i istorii psichologii* (Pedagogika, Moscow 1982a).
- Vygotsky, L.S.: *Sobranie sočinenij. II. Problemy obščej psichologii* (Pedagogika, Moscow 1982b).
- Vygotsky, L.S.: *Sobranie sočinenij. V. Osnovy defektologii* (Pedagogika, Moscow 1983).
- Wertsch, J.V.: From social interaction to higher psychological processes. A clarification and application of Vygotsky's theory. *Hum. Dev.* 22: 1-22 (1979).
- Wertsch, J.V. (ed.): *The concept of activity in Soviet psychology* (Sharpe, New York 1981).
- Zaporozhets, A.V.: Rol' L.S. Vygotskogo v razrabotke problem vospriyatija. *Voprosy Psichol.* 6: 13-24 (1966).
- Zaporozhets, A.V.: Some of the psychological problems of sensory training in early childhood and the preschool period; in Cole, Maltzman, *Handbook of Soviet psychology* (Basic Books, New York 1969).
- Zaporozhets, A.V.; El'konin, D.B.: Vklad rannich issledovanij A.N. Leont'eva v razvitie teorii dejatel'nosti. *Vestnik Moskovskogo Universiteta, Ser. 14, Psichologija* 4: 14-24 (1979).
- Zinchenko, V.P.; Ruzskaya, A.G.: Sravnitel'nyj analiz osjaznaniya i zrenija (Doklady APN 1959-1962).
- Zinchenko, V.P.; Vergiles, N.Ju.: *Formirovanie zritel'nogo obraza* (Izd. M.G.U., Moscow 1969).
- Zivin, G. (ed.): *The development of self-regulation through private speech* (Wiley, New York 1979).
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