

The Concept of Development and the Development of Concepts. Education and Development in Vygotsky's Thinking

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A major theme of Vygotsky's research in the latter part of his life was the theme of concept formation or conceptual development in child development. He argued that the acquisition of mature scientific (academic) concepts forms the crowning achievement of adolescence. Mature conceptual thinking positively influences the cognitive domain but also the aesthetic reactions and emotions. Conversely, the breakdown of conceptual thinking in pathology will lead to severe intellectual impairment but also to emotional dullness etc. In this paper it is claimed that this view is highly interesting but a number of criticisms are raised. Specifically, it is argued that (1) the resulting view is overly rationalistic; (2) the notion of scientific concepts seems to imply a somewhat static view of science; and (3) Vygotsky was perhaps too optimistic about the possibility of transfer of scientific (conceptual) thinking to other domains.

In the last two years of his life Vygotsky lectured and published on many and diverse subjects and at first sight the collection of these subjects does not seem to make a coherent whole but rather resembles a disorderly set of topics, as if someone took them at haphazard from his well-stocked files or bookshelves. Vygotsky dealt with, among other things, schizophrenia and Pick's disease, mental retardation, the peculiarities of written language, the concept of age period or stage, the connection between education and development, the role of play in mental development, the concept of consciousness, theories of emotions, scientific and everyday concepts, development and loss, the problem of the localisation of mental functions in the brain, and the diagnostics of cognitive development. Apart from that he published overviews of the main contemporary currents and concepts of psychology and paedology and prefaces to books by Koffka, Gesell, and Piaget. This impressive list testifies of Vygotsky's versatile mind and few modern researchers would venture to publish on so many and diverse topics.

However, on further inspection, it turns out that these topics are much more connected than it would seem at first sight and that Vygotsky actually applied his thinking concerning certain key concepts of psychology to various areas. The most central concept of Vygotsky's

thinking in this period was, indisputably, the concept of development. While analyzing schizophrenia and Pick's disease he was, in fact, analyzing the impairment of conceptual thinking in pathological development. When he spoke of written language and play, he was primarily interested in the way these activities restructure mental functions in development. Likewise, his conception of localisation was a genetic, developmental one and the topic of emotions interested him only in so far as it dealt with the ontogenetic development of emotions from primitive emotions as rage and fear to refined emotions as sadness and aesthetic pleasure. Finally, his prefaces to Gesell, Koffka, and Piaget were in reality long and penetrating critiques of how these investigators conceived of child development. So, without altering for one bit our assessment of Vygotsky as a most many-sided and prolific thinker, we may conclude that Vygotsky was actually dealing with a limited set of questions applied to many and diverse fields. These questions all concerned the concept of development.

Development and structure

So, what were the questions central to Vygotsky's thinking and how did he attempt to answer them? Among other things, Vygotsky wished to know whether it makes sense to distinguish age periods (or stages) in child development and – if so – which age periods one might distinguish. He was also concerned with the question of *what* it actually is that is developing (the problem of structures), and what it is that *propels* development. In developing his own views on these central questions Vygotsky relied heavily on the major developmental thinkers of his time such as Kurt Koffka, Jean Piaget, and William Stern. But the view of development at which he arrived – that of the major role of the acquisition and development of conceptual thinking – was a typically Vygotskian one and made use of notions that he had been consistently dealing with throughout his career.

We can get a first insight into Vygotsky's (1934a) view of development by taking a look at his extensive critique of Koffka's reasoning in the latter's famous "Grundlagen der psychischen Entwicklung". As is well-known, Koffka (1925) followed Köhler in defining insightful or intelligent behavior as behavior that is in accord with the structure of the visual field. Animals do not act on a trial-and-error basis as Thorndike had claimed, but adjust their actions to the structure of the field. Unfortunately, this definition of insightful or intelligent behavior as behavior that is in correspondence with the field structure proved much too general. Other researchers were happy to point out that by that definition many lower animals and even insects have to be called intelligent or insightful. By extending the concept of *Gestalt*, or structure, and the idea of insight or intelligence as structural correspondence (between the act and the perceived situation) to a great number of heterogeneous situations these concepts lost all their force. The fact that Köhler (1920) had found *Gestalten* in physics as well made things even worse. As a result "the Gestalt, withered to a logical formula, appeared at the basis of the world; in creating the world god said: let there be Gestalt – and there was Gestalt everywhere" (Vygotsky, 1926/1982). For Vygotsky this only proved that the concept of *Gestalt* or structural correspondence had lost its force as a criterion of intelligence and that we should seek another principle to distinguish between genuine intellect and the mental levels ontogenetically or phylogenetically preceding it. No single principle can cover both pre-intellectual and intellectual behavior and the fact that the Gestalt psychologists extended their principle to early stages of ontogenesis and phylogenesis in fact proves that the Gestalt principle is *not really developmental*¹. Being present in each and every stage of development the Gestalt principle cannot explain the differences between the various stages and it is, consequently, incomplete exactly because of its broad applicability. In other words, the Gestalt principle, gives some account of *what* develops in child development, but does not explain the *dynamics* of development nor does it specify the particularities of the different stages in phylogenetic and ontogenetic development².

Meanwhile, for Vygotsky it was quite clear that such different stages in cognitive

development exist and he increasingly paid attention to the role of speech in this context. In his critique of Koffka (1925) he pointed out that human children do not only live in a physical environment (*Umwelt*), but in a world filled with meaning (*Welt*). The structural, optical field which makes up the environment of animals and human infants gradually gives way to the semantic field of human adults, which is heavily dependent on verbal concepts. Whereas animals are locked in the *hic et nunc* of the situation they perceive, humans can transcend these boundaries of time and space and plan future actions in imaginary situations. In itself this viewpoint is rather general and not really original with Vygotsky and its value is heavily dependent upon the way it is elaborated (see Van der Veer & Valsiner, 1991). In order to get a proper impression of Vygotsky's thinking we will take a look at two additional claims he made that are of much importance for both the problem concerned – that of development – and the assessment of his whole theory. These claims are (1) that speech is a conceptual tool and that the acquisition of speech consists first and foremost in the acquisition of concepts and (2) that the acquisition of concepts restructures the structure of our mental processes taken as a whole or, in other words, that it re-structures our consciousness.

Conceptual development

In claiming that speech is a tool and that speech development consists in the acquisition of concepts Vygotsky was following various and diverse traditions in psychology. At first he was much impressed by Köhler's (1921) seminal chimpanzee research and endorsed Bühler's (1919) and Koffka's (1925) view that the stick used by chimpanzees to reach a desired piece of fruit was somehow comparable to the words children use to reconceptualize the problems they face. He gradually realized, however, that the inclusion of a stick into a situation leads to much less fundamental changes than the inclusion of speech. A chimpanzee may suddenly see how a properly placed stick can be used to solve a problem and in this sense the optical situation may be said to have been transformed by this sudden insight. But such transformations remain optical like in the case of the well-known Gestalt figures that can be seen in one of two ways and if the stick is not placed near the goal to be reached the insight may not follow. The influence of words seemed more dramatic to Vygotsky: they fundamentally re-structure our thinking and perception and it is very difficult for normal persons to *undo their working*. A chess master looking at a chessboard with pieces literally views a meaningful situation with the various moves and replies that should be made and can no more see the meaningless array of white and black pieces that the beginner sees. His whole conceptual apparatus determines his way of thinking and perception. The same is true for the connoisseur of art or music. But accepting the profound role of conceptual notions we are faced with other questions such as how these notions are acquired and how they change over time. In regarding this problem Vygotsky was at first inspired by the tradition of research into conceptual development begun by Narziss Ach and later by the work of Piaget.

Ach (1921) was the originator of a tradition of concept formation research that is alive until the present day. He presented children with an array of artificial objects that differed in form, color, size, and weight and essentially asked them to discover a concept (e.g. "big red cones") he had in mind and which he indicated by a nonsense word (e.g. "Gazun"). During the experimental session the children gradually detected what concept was behind the nonsense word and in this sense it may be said that the nonsense words acquired *meaning* for them (e.g. "Gazun" means "big red cone") and that Ach had discovered a means to lay bare the development of word meaning. Many variations in the experimental procedure are possible and Vygotsky and his co-workers experimented extensively with children to discover the developmental stages of concept formation or word meaning in such a laboratory environment (see Sakharov, 1928, 1930; Zankov, 1935; and chapter 11 of Van der Veer & Valsiner, 1991). It was discovered that before children reach a mature concept of, say, "triangle" they go through a whole series of pre-conceptual stages during which they may use the word "trian-

gle", but have in mind something that is quite different from the adult concept. Thus, the meaning of the word "triangle" changes over time, much like chess pieces acquire different meaning as the player becomes more experienced. For Vygotsky these facts were of fundamental importance as they seemed to prove that children – living in the same physical environment (Umwelt) as we do – are at the same time living in a different semantic world (Welt) that only gradually becomes equal to the adult one.

Piaget's (1923, 1924, 1933) investigations of the child's language and reasoning formed another major source of inspiration for Vygotsky's concept formation research. Relying on Piaget's distinction of spontaneous and nonspontaneous concepts he developed his notion of scientific and everyday concepts of which the former are taught in the school setting, whereas the latter are acquired in everyday life. Ideally, scientific concepts reveal the essence of a certain subject matter more thoroughly than do everyday concepts as they form the product of a long scientific development and form part of a system of interconnected notions that cover a certain area of thinking. Vygotsky's collaborator Shif (1935) managed to show in a cross-sectional study that the use and understanding of scientific concepts was quite different for children of different age groups. This again seems to prove that children's understanding and use of concepts undergoes a gradual development or, in other words, that ontogenetically speaking "a rose is not a rose is not a rose".

But what then causes these conceptual changes? What propels conceptual development? And do the effects of these changes carry over to other domains of cognitive and emotional development? These questions had still not been sufficiently answered and Vygotsky devoted the final years of his life to argue that (1) instruction in school is a major factor in causing the general development of conceptual thinking; and (2) the effects of conceptual change carry over to all other mental processes as these form an interconnected whole.

The problem of transfer

The question as to whether school instruction in specific subject matters leads to a general development of the child's conceptual thinking had been hotly debated in the nineteenth century. Some had claimed that the study of certain highly valued subjects such as mathematics and Latin – the so-called formal disciplines (*formale Bildung*) – will allow the child to grasp other subjects more profoundly and more rapidly, while the opponents had contested this claim following Herbart who boldly stated that "Der Verstand der Grammatik bleibt in der Grammatik; der Verstand der Mathematik bleibt in der Mathematik" (see Geissler, 1979, p. 241). In later years Thorndike had defended a version of Herbart's point of view while Koffka (1925) vehemently argued that learning cannot be specific to certain subject matters and carries over to other areas.

Vygotsky agreed with Koffka in claiming that the study of school subjects has a generalizing effect and Shif's (1935) study was designed to prove his point. Shif claimed that she found that the scientific concepts that the children mastered influenced their everyday reasoning as displayed in her study. This would prove the phenomenon of transfer, that is, that scientific thinking spreads over other areas of thinking as well. Unfortunately, both Shif's reasoning and her methodological design suffered from a number of shortcomings and her major conclusions remain contentious (see Van der Veer & Valsiner, 1991, pp. 274-277). Modern research has not fully resolved these issues, although it does seem quite hard to prove the general effects of mastering specific knowledge and skills (cf. Ong, 1982; Scinto, 1986; Scribner & Cole, 1981).

The more general question as to whether the conceptual development of the child carries over to his or her other mental processes, such as perception and emotion, is even less settled. Like the more narrow statement about the relation between scientific concepts and everyday concepts it is plausible and Vygotsky was very skilled in arguing its plausibility by referring to possible pathological evidence and to various analogies. Naturally, he was most interested

in cases of aphasia as these seemed to indicate a break-down of conceptual thinking. The finding of Gelb and Goldstein (1925) that some aphasics lost the ability to categorize colors seemed to indicate that the disintegration of conceptual thinking indeed leads to impaired perception. This would prove, then, that perception is to an extent language-based and forms part of the larger systemic whole of consciousness. Likewise, Vygotsky (1934b) argued that the symptoms of schizophrenia (e.g. incomprehensible speech, loss of understanding of metaphorical expressions) are due to a break-down of conceptual thinking and a regression to the level of associations. The schizophrenic patient would go through the different stages in conceptual development in reverse order and Vygotsky even surmised that the emotional dullness of schizophrenic patients is due to the fact that emotional expressions are separated from the concepts with which they are closely associated. In sum, it could be argued that the disintegration of conceptual thinking leads to a number of problems in other areas of mental functioning as well.

Implications

Let us now try to summarize several of the findings and arguments pertaining to the problem of development. Vygotsky argued that human cognitive development is different from animal development in that it is largely based on language. The most important function of language for cognitive development is that it enables us to master the (scientific) concepts that developed in our culture and that allow us to understand and manipulate the environment around us. Scientific concepts are first and foremost acquired in the setting of school instruction and the ability to utilize genuine concepts marks the completion of early adolescence (Vygotsky, 1931). The influence of mature conceptual thinking, however, is not confined to the cognitive domain but will at the same time lead to more mature aesthetic reactions and a more refined emotional life (Vygotsky, 1925/1987; 1933/1984). In case of serious pathology, such as in schizophrenia (Vygotsky, 1934b) or Pick's disease (Samukhin, Birenbaum, and Vygotsky, 1934), the thinking in concepts will be influenced adversely and several of the symptoms of these diseases – emotional dullness, loss of abstract word use – can be understood as the result of the break-down of conceptual thinking.

The resulting view is fascinating and highly controversial. Vygotsky comes out as a modern Spinoza (cf. Van der Veer & Valsiner, 1991) who considers the development of rational understanding based on scientific concepts as the key to a fruitful conception of cognitive and emotional development. In this view the analysis of the concept of development is indeed not adequate and complete without the analysis of the development of (scientific) concepts. The fundamental role of school instruction and education at large is to provide these scientific concepts and in this sense education really is a constituent of development.

What can we say of this view? Firstly, it can be said to be overly rational or rationalistic. Some would argue that school does more than to provide scientific thinking in the form of scientific concepts: it transmits social norms, values, and should promote such desirable things as mutual cooperation between pupils etc. I think here both Vygotsky's personal preferences and the pervasive spirit of the time played their role. It was widely believed in the Soviet Union of the 1920s and 1930s that scientific understanding would bring about a new and happy society and Vygotsky himself stressed the importance of "cold", rational insight into one's own actions as well as other phenomena more than once. The notion of the liberating, emancipating influence of rational, scientific insight cannot be separated from Vygotsky's thinking and a fruitful critique should contrast this notion with other views of the role of education in society.

Another point that one might want to criticize is the notion of the scientific concept itself. It might seem to imply a somewhat static view of scientific thinking in which scientific views crystallize into scientific concepts that subsequently have to be transmitted to the new generation. In this view the scientific concept – e.g. the concepts of "mammal" or "atom" – is

seen as a deposit of the results of years of scientific thinking and in this sense the concept seems static, finished, or "dead". They transmit the state of the art as it was when the writers of textbooks sat down to try and write their version of scientific research in some area of thought. Rather than arguing such a view – which is doubtlessly correct in some respects – one might suggest a more dynamic one in which the pupils are taught the tools to think more or less *scientifically themselves*. The ability to think "critically" might be promoted by teaching pupils to utilize certain heuristics and skills that may be used flexibly in broad contexts. I have no doubt that Vygotsky would have agreed to such a view and that his concentration on scientific concepts was due to historical circumstances and the level of scientific thought at the time. Modern attempts to teach children to think critically or to "philosophize" might well be harmonized with a Vygotskian approach.

Finally, there is the question of transfer that has been raised earlier. From his own systemic view of consciousness Vygotsky was convinced that the acquisition of knowledge and skills in one domain will lead to changes in other domains as well and he listed many research findings of both himself and other researchers to argue this view. The more fundamental views about the role of language and tools in the construction of human personality and the spreading of their influence to other domains of mental functioning are still very much alive and form the subject of much discussion (Greenfield, 1991a, 1991b; Greenwood, 1992). The least one can say is that there is still a good case for the claim that language development profoundly influences such mental processes as perception and emotion. On the other hand, it has been shown that within the cognitive domain people can be surprisingly inconsistent – as if the mind is indeed built according to the principle of modularity – and it has proved notoriously difficult to prove that the mastering of some skills influences the subsequent mastering of other skills. The problem of the "formale Bildung", in other words, has still not been solved to everyone's satisfaction, although new candidates for such formal disciplines – e.g. playing chess at school – are advanced with surprising regularity³.

Summarizing, we may say that Vygotsky's view of the role of education in development is highly interesting and well-argued, but in need of further development, criticism, and amendments. But this is only as it should be and the best tribute we can pay to Vygotsky's legacy is to criticize it on both theoretical and empirical grounds. Being a skilled dialectician Vygotsky would have been most happy with any valid criticisms, extensions, and amendments.

Notes

- 1 Piaget, too, criticized the Gestalt notion for its non-developmental character. See Flavell (1963, p. 73).
- 2 Piaget dealt with both aspects by positing both structures (schemata) and the dynamic principles of adaptation, equilibration, and maturation.
- 3 In this context it is significant that proponents of the independent gymnasium in the Netherlands claim that the study of Latin and Greek, apart from being intrinsically valuable, promotes the general cognitive development of children, while their opponents deny this, but basically make the same claim for such topics as computer science.

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Current theme of research:

Sociocultural theories of child development.

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