Vygotsky on the Development of Concepts

Chapters 13 & 14 of *Concepts. A Critical Approach*

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The Soviet psychologist Lev Vygotsky (1896-1934) was convinced from his observations of infants and children that perception begins its development in the new-born or infant from an initial awareness of an undifferentiated whole, the child then gradually becoming aware of a more and more differentiated whole, eventually learning to pick out individual objects. But the psychologists of his time, just like the cognitive psychologists of today and the entire tradition of analytical philosophy since Kant, had a 'bottom-up' notion of perception. They held that perception must begin from a disorganised confusion of individual stimuli, gradually joining the 'pixels' together to build up images of individual objects and thus, the relation between them, with the child able to perceive an entire situation only at the end of the development.

A well-known experiment was used to validate this conception which is widely held in analytical science. W. Stern proposed a four-stage schema (object, quality, relation, action) for the development of perception based on the experiment. A child is shown a painting and asked to tell the researcher what they see. The child is at first able to name separate objects and only much later able to describe what is happening and thus finally the situation depicted in the painting. Vygotsky cited the experiments of H. Volkelt and W. Eliasberg (LSVCW v. 5, p. 86) which demonstrated the opposite. When asked to describe the painting in words, children who could only name separate objects, if asked to *act out* what the painting depicted were able to perform a representation of the entire situation accurately. So what psychologists were testing was not the child's perception, but their ability to bring their perception into conscious awareness and then translate it into words and articulate the words in answer to a question from a stranger – quite a different matter. And most of the works of cognitive psychology on concepts fall down on precisely this ground. Asking people to answer a questionnaire tests their written-language skills perhaps, but tells us only about one possible *realisation* of a concept in the laboratory, not the concept itself.

Nonetheless, the prejudice that perception can only occur by the joining together of arbitrarily small chunks or pixels remains deeply embedded in analytical philosophy. The great German poet and naturalist Johann Wolfgang von Goethe was the first to challenge this prejudice, and his ideas were the inspiration for Gestalt Psychology as well as for Hegel's philosophy and lie at the root of much of the discoveries of the American Pragmatists. It seems that the analytical prejudice is not just a mistaken theory of perception, but a deeply-ingrained conviction about the nature of reality itself, as if a musical note was perceived by mentally tracking air pressure up and down 1,000 times a second and computing the dominant frequency! The decisive break of psychology from this analytical tunnel vision essentially came from outside psychology. Vygotsky was a young student of aesthetics who had been won to Marxism by the Russian Revolution and, moved by the plight of children orphaned by the Wars of Intervention, became a teacher and psychologist. He made his first public intervention in 1924.

Lev Semenovich Vygotsky was raised in Gomel, within the Jewish Pale in Tsarist Russia. He was a brilliant student, reading avidly in history and philosophy, and running a

reading group amongst his school friends around issues of Jewish history (Levitin 2011). His reading evidently also included the writings of the founder of Russian Marxism, Georgi Plekhanov. Being a Jew, even as a 'gold medal' student, he was lucky to be admitted to university in Moscow to study law in 1913.

During his time in Moscow, Vygotsky was involved in ideological struggles within the domain of aesthetics, theatre and literary criticism, in which Symbolists and Formalists did battle with Futurists and Constructivists. Deeply engaged with problems of hermeneutics and semiotics as they were being fought out on the European stage, this was a formative period in his intellectual life, and culminated in the writing of "The Psychology of Art."

Graduating in 1917, and after taking a course in psychology and philosophy at the People's University of Shanyavsky, he returned to Gomel to teach literature and psychology at the school there. He also conducted classes at a drama studio and delivered lectures on literature and science. In the wake of the Revolution, he organised a psychology laboratory at the Gomel Teacher's College where he participated in the preparation of a new generation of teachers. He also wrote a manual for teachers called "Educational Psychology," a somewhat eclectic overview of the main issues and approaches to the subject at the time.

Coming from the highly politicised pre-Revolutionary struggles over aesthetics, and the real problems of education in a country shattered by war and revolution, and inspired by the prospect of creating 'Socialist Man' in the Soviet Union, Vygotsky wanted a psychology which was up to its subject matter: the actual life of human beings, not just laboratory reactions. With early training in hermeneutics, phenomenology, linguistics, drama theory and literary criticism, rather than physiology and dog training, he approached the various currents of psychology he found around him in Russia critically. Vygotsky took an active interest in the whole sweep of science and culture, and appropriated what he needed to build a cultural psychology from wherever he found it. This approach was not well understood in that period in the Soviet Union, in which all the sciences and professions were highly politicised, Marxist orthodoxy was valued, and every theory associated with the bourgeois world was anathema. This made it difficult for people to understand Vygotsky; he could not be pigeon-holed.

The Soviet Union in the early 1920s was a cauldron of creativity, but the physical and intellectual conditions were desperately inadequate. The entire resources of the country which had not been destroyed were mobilised in a highly charged ideological atmosphere. Nothing was impossible or out of bounds. History was being made everywhere.

Early in 1925, Vygotsky set up an Institute for Defectology, i.e., for the treatment and education of children with all kinds of disability, in his home town of Gomel, and along with Alexander Luria became a student of medicine, side-by-side with teaching and research. This was soon interrupted however by a serious bout of tuberculosis, the illness which dogged Vygotsky's life and would ultimately take it from him.

On his return to activity, he began to work his way through all the current theories: Freud, Piaget, Adler, Koffka, James, ... critiquing them and appropriating the insights each had to offer. But political conditions were deteriorating. In 1931, the regime restored the pre-revolutionary curriculum in schools and new ideas were not welcome. Vygotsky worked prodigiously, as if in a hurry, and in the early 1930s gave lectures (transcribed by his students) and wrote the manuscripts in which his scientific legacy,

the foundations of cultural psychology, were set down. The main works are “Thinking and Speech,” “The Historical Meaning of the Crisis in Psychology,” “Lectures on Psychology,” “History of the Development of the Higher Mental Functions,” “Problems of Child Psychology,” “Tool and Sign in the Development of the Child,” and “The Teaching about Emotions.” The Institute for Defectology in Gomel provided a refuge for Vygotsky’s students to continue their work as the political pressure continued to mount.

Vygotsky was overtaken by a final bout of tuberculosis and died in 1934. During the following 12 months, some of Vygotsky’s works were published, but political conditions rapidly darkened as the Moscow Trials got under way. Stalin had almost the entire leadership of the Soviet state, the Army and the Party denounced as saboteurs and shot. Terror penetrated every profession, every workplace, every family. Vygotsky’s works were suppressed and could not even be discussed within professional circles until after Stalin’s death in 1953, and remained unknown in the West until 1962.

The dominant current of psychology at the time in both Russia and the U.S. was not the study of the psyche at all, but rather behaviourism. As J. B. Watson put it:

> Psychology as the behaviorist views it is a purely objective experimental branch of natural science. Its theoretical goal is the prediction and control of behavior. Introspection forms no essential part of its methods, nor is the scientific value of its data dependent upon the readiness with which they lend themselves to interpretation in terms of consciousness. The behaviorist, in his efforts to get a unitary scheme of animal response, recognizes no dividing line between man and brute (1913).

Throughout the twentieth century several varieties of Behaviourism operated in Russia, with founding figures of the status of Pavlov, Bekhterev and Sechenov. At the time Vygotsky entered psychology, the dominant current was Reflexology which took the stimulus-response link, whether conditional or unconditional, as the basic unit of the nervous system: everything was a reflex. Vygotsky demonstrated that Reflexology was able to make only the most banal findings from its research while the actual life of human beings lay beyond its horizons.

On the other side, opposed to Behaviourism, was ‘subjective psychology’, that is, reliance on a subject’s introspection to observe their own consciousness, an insight available only to the subject themself and made available to the researcher through questioning. Subjective psychology, chiefly represented by Wilhelm Wundt’s Experimental Psychology, was rich in content, but scant in scientific credentials. In the atmosphere of post-revolutionary Russia, it was more or less dismissed as idealist and bourgeois. Vygotsky had studied under Gustav Shpet, the Russian proponent of Husserl’s Phenomenology, which took consciousness as apprehended by introspection as its subject matter, with the aim of creating an exact science of the forms of introspective consciousness. The problem is that, as Fichte had demonstrated more than a century earlier in philosophical terms, and Freud had demonstrated clinically, people are not generally aware of their own consciousness, and certainly not reliably so. The Freudian slip is evidence of what Freud called the Unconscious, which is inaccessible to introspection. Anyone who has practised music, acting, driving or other performance skills knows that as soon as we attempt to make our own thinking the object of attention, we lose the very object we wished to study. The fact is, *we cannot know our own mind*. Vygotsky concluded that what is studied in Phenomenology is *appearance*, not reality (LSVCW v. 3, p. 325), and therefore he had to agree with the behaviourists to the

extent that introspection could not be the basis of a science (though this did not prevent Vygotsky from utilising the methods of Phenomenology from time to time).

On the other hand, it was perfectly obvious that consciousness formed an *essential* component of human life and no science of human behaviour was possible without including a concept of consciousness as the proximate cause of behaviour. Vygotsky defined consciousness as that which mediates between physiology and behaviour. "It *does not exist in reality*, but results from two non-coincidences of two really existing processes ... The subjective is appearance and therefore it does *not exist*" (*ibid.*). Science can only base itself on what exists: behaviour and physiology. Vygotsky therefore agreed with the American Pragmatists, that ideas could be imputed from the human actions in which they were implicit. On the other hand, the physiology underlying consciousness could shed further light on the means by which consciousness was realised, but in his lifetime little progress had been made along these lines. Neither physiology nor the study of behaviour could give us unmediated access to consciousness *as such*, but this was after all no different to the task of the historian, the physicist, the geologist, who must *reconstruct the object* of their science from the empirical traces given to the senses and their instruments.

In fact, the behaviourists were already using consciousness in their experiments: "Did you feel that? Tell me when you see two images," etc., etc. Not only were the behaviourists relying on the subjects' speech in reporting their reactions, and also their own speech in directing the subjects' behaviour: "Would you please sit down", but they were *excluding* subjects' speech (as a mode of behaviour) and their own speech (as a mode of social interaction) from being taken as part of the experimental data. The normal human condition, in which all the phenomena of consciousness are manifested, is social. But the behaviourists set out, in the name of science, to exclude social interaction from their experiments, and not only did they generally fail to isolate their subjects from their source of motivation in everyday life, but they excluded the subjects' social interaction with the researcher from the experimental data.

So Vygotsky concluded that it was both necessary and possible to create a science of consciousness, and that the method of studying consciousness would be the observation of behaviour, including interactions with the researcher and with artefacts belonging to the wider culture. Only in this way could the normal interactions with other people and using language and so forth, the normal conditions under which consciousness is manifested, be reproduced in a controlled situation. From these observations, the processes of consciousness could be reconstructed.

Vygotsky concentrated on the development of children on the basis that it was only possible to understand a phenomenon to the extent that you understood it as a process of coming-into-being, rather than being limited to observation of the finished product of development. The evolutionary and historical processes of the formation of human behaviour, were simply not available for observation, but child development and rehabilitation of people suffering from various processes of disintegration of the psyche, provided the opportunity to study the mind as a process of formation. Further, in order to be able to observe the development of psychological processes in children, it was never sufficient to passively observe them. It was necessary to actively intervene in a child's development and assist them in completing tasks that they were as yet unable to accomplish. On the other hand, the study of people suffering from psychological or neurological illness or trauma, and the rehabilitation of such subjects, gave

psychologists the opportunity to study psychological processes, not only in their process of formation, but also in their process of disintegration.

With this introduction to Vygotsky and his method of work, let us move now directly to his investigation of concepts.

Concepts

Vygotsky does tell us what a concept is, but he hardly puts it in bold type. In fact, most people who have read "Thinking and Speech" attentively will still be none the wiser on that score at the end of the book. Since Vygotsky's answer is also somewhat challenging, we should postpone looking at what he says a concept is, and for the moment just follow his thinking, having in mind for 'concept' just what we usually have in mind when we say 'concept'. But with one qualification.

Vygotsky distinguishes between concepts (in general) and 'true' concepts. He also talks about 'everyday concepts' or 'spontaneous concepts' in contrast to 'scientific concepts'. He is adamant that true concepts do not enter a person's thinking at least until adolescence. Before this time, the child uses thought processes which provide the basis for thinking in concepts, but which are *not yet* concepts. "At any stage of its development, the concept is *an act of generalisation*" (LSVCW v.1, p. 70) but it takes a decade or two for a young person to attain the kind of generalisation which adults use. Most of Vygotsky's writing actually concerns concepts which are not yet true concepts. 'Concept' may cover anything from the earliest form of generalisation that a child uses as they interact with their environment up to a true concept; all are referred to as 'concepts'. Thus, as Goethe had remarked, the same word is used for both the process and the final product.

A 'true' concept is a socially fixed and transmitted solution to some problem which has arisen in social practice in the past, not a bundle of attributes or features associated with some object. Such a bundle of attributes Vygotsky calls a 'pseudoconcept' and it is the kind of generalisation children acquire until they begin to go out into the world and become involved in the problems of social life and a profession. Children can use a word as the sign for a pseudoconcept to indicate the same object as an adult indicates using the same word as the sign for a true concept. This means that adults and children can effectively communicate with one another, except that from time to time it comes out that a child does not fully understand some concept or other, but both adult and child know what each other are talking about.

Concepts which are not yet concepts Vygotsky calls 'complexes', and the type of thinking facilitated by use of complexes he calls 'complexive' thinking. There are a number of distinct stages and lines of development of complexive thinking which children must go through before they are able to use true concepts. I will outline these at length below, tracing Vygotsky's analysis of the development of complexive thinking.

The 'Double Stimulation' Experiment

There are two sources of information which Vygotsky draws on in this work. On the one hand, he draws on his own observation of infants and children and the reports of others, and on the other hand, a famous experiment he adapted to this purpose, known as the 'functional method of double stimulation for the study of concept formation'. The 'double stimulation' experiment allowed him to reproduce in a controlled laboratory setting, the kind of thinking and problem-solving which can be observed in the real life behaviour of children. This allowed Vygotsky to verify in a controlled, repeatable

experimental setting the observations he made about the development of the real thinking of human beings in their normal, social environment. This experiment has been reproduced both in 1942 by E. Hanfmann and J. Kasanin and by P. Towsey and C. Macdonald (2009). In both cases, Vygotsky's observations were verified in very different circumstances and times.

Today's Psychology of Concepts has produced a confusing array of contradictory claims and counterclaims as to what a concept is. Is a concept a dictionary definition, a visual image, an ideal type, a link on a network of associations, a list of features, a metaphor or what? By contrast, Vygotsky traced the *development* of a child's ability to grasp the situations she finds in her environment, and as this ability develops, make generalisations which pass through a series of different modes of action from infancy to adulthood. In this way, there is some prospect of making sense of the seemingly contradictory results of the investigations and claims of contemporary psychology.

Vygotsky collaborated in 1927 with a young colleague, Leonid Sakharov, in adapting the double stimulation' experiment from one devised in 1921 by Narziß Kaspar Ach of the Würzburg School. Now Ach, and it seems Sakharov as well, took a 'concept' to be synonymous with a bundle of features, just as today's cognitive psychologists and analytical philosophers do. This has led to some confusion because Sakharov's very well-known description of the experiment and indeed the very nature of Ach's experiment itself, seems to take this for granted. The basic idea of Ach's experiment is that the subject is asked to use a word to pick out a group of blocks sharing common features with each other but not other blocks, and thereby demonstrate that they have formed a concept of a certain type of block, e.g. the large-green blocks or the round-red blocks. The experiment allowed for no other action by the subjects and apart from the mistakes they made, and the verbalisations they uttered in response to their results, no other kind of action connected to concept formation was observable in this set up. As will be seen, Sakharov's modification of the experiment required the child to *freely create* groupings of the blocks to solve a puzzle, rather than, as Ach had required, simply *observing* and memorising a grouping made by the researcher, and this provided a much richer experimental process. But nonetheless, the experiment to some extent has built into it the kind of result which could be expected, namely grouping blocks according to their contingent attributes. In the light of broader experience with children's concept formation, this limitation of the experimental design turns out to have some justification for use with children, but we will have to return to this problem later. For the moment, we will take all such 'concepts' formed in the course of the experiment to be 'artificial concepts' since they are to be found only within the laboratory under artificial conditions and are not to be found in real life situations.

Ach used 48 blocks, each block with a unique combination of geometric shape, size, weight and colour: 4 colours, 3 shapes, 2 sizes and 2 weights. Each of the blocks was labelled with one of 4 nonsense words. The words corresponded to a unique combination of just two of the four possible type of feature.

Ach's aim had been to observe the formation of concepts from scratch under laboratory conditions, using mainly adults, but also some children. The subjects were given a period of training in which they had an opportunity to learn the nonsense word attached to each block (corresponding in fact to a specific combination of the block's features). Then a grouping of blocks was shown to the subject and the subject asked to recall the nonsense word shared by all the blocks in the given grouping. The subject's mistakes

and their explanation were recorded, along with the number of periods of training and searching required to correctly solve the puzzle.

Ach's methodology had been based firstly on recognition that concepts could not be understood by simply observing the finished product, but on the contrary, it was necessary to observe the *formation* of a concept. Consequently, it was necessary to create an experimental set-up in which a concept could be formulated by a subject for the first time, and therefore the concept had to be entirely artificial. Secondly, he wanted to study how a word took on the significance of indicating a specific combination of features or 'concept', so it would be necessary to use nonsense words given an *artificial* meaning, but which would initially have no meaning for the subject. Thirdly, the subject must be motivated to solve some kind of task, rather than relying on the false assumption that a concept could be formed and a word could acquire significance simply by repeated passive exposure and association. Thus the experimental set-up was designed so that it would be possible for the subject, by paying attention to which blocks had which name, to work out the meaning of the nonsense word, and use the newly-acquired word meaning to solve the puzzle and correctly name a group of unlabelled blocks.

Sakharov and Vygotsky found that this methodology did not fully demonstrate the processes that they were interested in, and modified Ach's procedure in favour of the following procedure. (A full description of Ach's experiment and a number of its predecessors, and Sakharov's criticisms are given in Sakharov (1928). Here I am bringing out only the points which are essential for our theme.)

The blocks are laid out in a higgledy-piggledy fashion, and the child told that these are the toys of children of a foreign land. One of the blocks is shown to the child, and the name underneath read out (say *gur*) telling the child that this is the name given to this toy in the foreign land, and would the child like to see if they can pick out which of the other blocks are *gur*. The child then picks out a group of blocks that they think are also *gur*; after each such attempt, the experimenter turns over either one of the selected blocks which is not *gur* or one of the discarded blocks which is *gur*, thus revealing the child's mistake. Thus the words used to name the various categories of block are revealed to the child only gradually. The child's first guess is made without any help from the names whatsoever, and the experimenter is able to see how the child spontaneously groups the blocks in an 'uneducated guess'. As the experiment progresses, the experimenter is able to see how the child makes use of the names given to the blocks to improve her guesses. For use with very small children arbitrary coloured shapes were used instead of words.

This allows the researchers to see how the child's spontaneous grouping of the objects of the adult world is modified by the use of symbols provided from the adult world. The child is confronted with a problem which is actually impossible for them to solve, though they make guesses according to however they make sense of what is presented to them. The word is offered as a means of solving the puzzle with which the child is already engaged. The way the child organises the blocks into categories using the word realises the process of concept formation by means of the word. The method is called 'double stimulation' because it follows a model Vygotsky used to investigate a number of psychological functions. The subject is confronted with a task which they cannot solve (the object stimulus); they are then offered a cue, such as an *aide mémoire* (the sign stimulus), which they can use to help them in solving the task. In learning to use

the sign stimulus, the child forms a 'higher psychological function' in order to solve problems which their existing psychological functions cannot solve. An example would be remembering with an *aide mémoire*, rather than having to rely simply on biological memory. This is a general model of the cultural formation of the mind. A sign from the surrounding culture is incorporated into a child's problem-solving, utilising existing psychological functions in a new combination which is both more powerful and more under the control of the subject themself as well as being adapted to the culture into which they are growing up.

So the 'double stimulation' experiment allows us to observe how a child groups blocks according to the blocks' attributes, and then modifies their categorisation by the use of the new word. I will review the results of this experiment by following the development of concepts in two parallel lines. On the one hand, I will follow observations of the behaviour of children as they grow up in their normal cultural environment, tracing the normal development of concepts in real life. On the other hand, I will follow the successive grades of concept recreated in the double stimulation experiment.

Infancy

At first, the child, an infant, is quite unable to abstract from the visual image of the blocks any of the attributes or features, and nor would they be able to make any use of the signs which have been offered to them as a means of solving the problem.

During the first year of life, a child will be quite unable to use the sign-stimulus, will not understand the directions from the experimenter and can relate to the objects only haphazardly. It is really senseless to talk of concepts at all at this stage of development. The child is in the process of developing their strength and energy and control of their own body, establishing social connections with those around them, and relates to objects in the world only via the mediating action of other people. They do not clearly differentiate the limits of their own body or between engaging an adult for help and direct action on an object itself. But during the crisis of development which the child experiences around one year of age, when the child first begins to try to talk, then we have the first beginnings of the development of concepts. This crisis happens generally around the same time as the child makes its first clumsy efforts to walk, but the significant point is that embryonic concepts appear only at the same time as embryonic words make their appearance. (See LSVCW, v. 5, p. 207-241)

Nonetheless, there will be those people who insist that an infant *does* have concepts, such as a concept of their mother, as evidenced by the infant's response to its mother's presence, reaching for her breast and so on. For that matter, there are some who will insist that the fox has a concept of chicken and the chicken a concept of fox. This raises again the question of what is meant by 'concept'. Is it just a question of having a word for something? Clearly not, for I will show presently that, for Vygotsky, being able to name an object is *not* evidence of having a concept of it, at least not of a true concept. But nor is concept-use just a question of behaving appropriately in response to an object or situation, something machines and lower animals do well. A concept is a specific form of mediated activity in which the person *distances* themself from the situation, as opposed to an immediate relation of an individual to their environment: a concept stands *between* the subject and the object.

A concept is a *mediated* relationship of a person to their environment in which a word, acting as a sign for a problem or solution encountered by the community in the past, is used to organise the individual's actions, but which necessarily also includes immediate

sensorimotor interactions with the environment. It is this relationship to one's own activity which is both culturally mediated *and* immediate, which is essential to concepts. But a simpler form of action which *lies on a line of development leading to true concepts*, may be described as a concept, in that most *general sense*. Infants and animals do not in general use signs to organise their activity, and insofar as animals do use signs, this behaviour cannot be further developed into conceptual thought properly so called.

But the activity of an infant only develops into conceptual thinking in this most general sense after the child has passed through a crisis which puts the child's activity on to an entirely different basis. In not fully differentiating themself from the objective world, in not fully differentiating the objects in the world from the adults who help them with those objects, their psychological relationship to the world and their activity in the world is immediate and not mediated. In so far as their relationship to the world is mediated (for example through sensorimotor activity itself) the mediating element is their own body – grasping, crying, sucking and so on. In such a condition a child is not able to develop concepts at all. Indeed, in their first efforts at using words, they completely fail, but, as the saying goes, in order to swim one must get into the water, and once the child throws themself into speech, they begin to learn and the most embryonic phenomena of conceptual thinking can be said to have come into being.

Syncretic Concepts

When the child begins to vocalise and tries to make words, they are not at first able to form the words of the adult language and instead utter words like *poo-poo* and *ba-ba* and so on. At this very first stage it is not possible for adult carers to make any sense of what the child is trying to say. This is the beginning of what is called 'autonomous speech' (LSVCW v. 5, p. 249). When a very young child attempts to respond to the researcher's urging to find all the *gur*, the result is that the child simply collects blocks at random, just whatever next strikes the child's eye. The following excerpt appears in the context of a presentation of the 'double stimulation' experiment with very young children.

> The first stage in the formation of concepts is most frequently manifested in the behavior of young children. Faced with a task that an adult would generally solve through the formation of a new concept, the child forms an unordered and unformed collection. He isolates an unordered *heap* of objects. The child's isolation of these objects, objects that are unified without sufficient internal foundation and without sufficient internal kinship or relationships, presupposes a diffuse, undirected extension of word meaning (or of the sign that substitutes for the meaning of the word) to a series of elements that are externally connected in the impression they have had on the child but not unified internally among themselves.
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> At this stage of development, word meaning is an incompletely defined, unformed, syncretic coupling of separate objects, objects that are in one way or another combined in a single fused image in the child's representation and perception. A decisive role is played in the formation of this image by the syncretism of the child's perception and action. This image is, therefore, extremely unstable (LSVCW v 1, p. 134).

These are the kinds of concepts which I referred to in the introduction as syncretic concepts, that is, concepts which are not so much formed by the subject themselves, but which simply happen by, one after another, as if watching the countryside from the window of a moving train. This form of concept is also called a 'heap'.

In the second phase of development of syncretic concepts, the spatial relationship between the blocks gathered into a heap comes forward as the determining feature.

> Once again, the purely syncretic laws that govern the perception of the visual field and the organization of the child's perception are critical. The syncretic image or heap of objects may be formed on the basis of the spatial or temporal encounter of isolated elements, the direct contact among these elements, or some more complex relationship arising among them in the direct process of perception. The factor that continues to be basic to this period is the fact that the child is guided not by the objective connections present in the things themselves, but by the subjective connections that are given in his own perception. Objects are brought together in a single series and subordinated to a common meaning not on the basis of general features that are inherent to them and that have been isolated by the child but on the basis of a kind of kinship that has been established between them by the child's impressions (LSVCW v 1, p. 135).

In the third phase of this earliest stage of concept formation, the child's entirely unstable and unconscious behaviour is unified and given some stability by the child bringing all the blocks together in a heap and giving them their name. The category of "these ones here" is at least a step towards some kind of stability, albeit entirely subjective. These syncretic concepts are the first major stage of concept formation, in Vygotsky's classification scheme. The last major stage is true concepts. The majority of Vygotsky's writing on concept development concerns the main stage in between syncretic concepts and true concepts, which Vygotsky calls 'complexes'.

It might be noted as an aside that the concepts formed in the first major stage (Syncretism) correspond well to Hegel's concept of Being, whilst 'true concepts' correspond to the third Book of the Logic, The Concept. The intervening stage, complexes, belongs to what Hegel calls Essence, the genesis of the Concept. Vygotsky makes no reference anywhere in those of his writings which have been translated into English to the structure of the Logic, though he had closely studied Lenin's Annotations on Hegel's Logic. If he was aware of this relationship, he never said so.

Complexes

According to Vygotsky, the first phase of complexive thinking also emerges in this crisis period of the child's development. Complexes go through a process of development, in which Vygotsky identifies five different types, which do not neatly fall into phases because two parallel processes of development are at work: analysis and synthesis, and two unifying factors: function and similarity. The child must both abstract attributes of the blocks from the concrete perceptual field (analysis), and at the same time, the child must group different blocks together in collections (synthesis); and the child may do so on the basis of either functional connections between objects or sensory likeness. Also, at the beginning of the process of development, the complexes are entirely *concrete* groupings. The concept is fixed as a concrete image of just these blocks or something resembling them. By the end of the process, the child has acquired a thought form which is fully abstracted from the perceptual field and is in that sense a preconcept. But I shall outline the phases of development of complexive thinking, with the caveat, that the sequence is not stable because of the possibility of uneven development of analysis and synthesis, function and similarity.

One type of complex is called the Chain complex, and according to Vygotsky, the first to describe this behaviour was Charles Darwin, who observes his own grandson using 'words' for the first time.

> [Charles Darwin] noticed that before going on to the speaking period, the child spoke an original language. The originality consisted of the fact that, *first*, the sound composition of the words used by the child differed sharply from the sound composition of our words. In its motor aspects, that is, from articulation and phonetic aspects, that speech did not coincide with our speech. ... The *second* difference, more essential and more important, to which Darwin called attention, is that the words of autonomous speech *differ from our words in meaning also*. ... Once, on seeing a duck swimming in a pond, his grandson, whether imitating its sounds or what the adults called it, began to call it 'ooah'. These sounds were pronounced by the child when he was at a pond and saw a duck swimming in the water. Then the boy began to use the same sounds for milk spilled on the table, for any liquid, wine in a glass, even milk in a bottle, obviously transferring the name because there was water or a liquid. Once the child was playing with old coins with pictures of birds. He began to call them 'ooah' also. Finally, all small, round, shiny objects that resembled coins (buttons, medals) began to be called 'ooah' (LSVCW v. 5, p. 249).

Altogether, using the 'double stimulation' experiment, Vygotsky identifies four different types before the final type of complex which he calls a pseudoconcept, which crowns the development of this stage of concept development and which we will consider last. "The foundation of the complex lies in empirical connections that emerge in the individual's immediate experience. A complex is first and foremost a concrete unification of a group of objects based on the empirical similarity of separate objects to one another" (LSVCW v. 1, p. 137). These may be sensuous attributes of objects, functional or other contingent associations discovered in immediate experience.

The first of the types of complex is built around the perception of one object which forms the nucleus of the complex, and is referred to as an '*associative complex*':

> because it is based on an associative connection between an object that is included in the complex and any of the features that the child notices in the object that acts as the complex's nucleus. Around this nucleus, the child can build an entire complex composed of the most varied objects. Some objects may be included in the complex because they are the same color as the nucleus. Others may be included on the basis of similarity in form, dimension, or any other distinguishing feature that the child notices (LSVCW v. 1, p. 137).

The second type of complex is based on supplementary grouping of objects, and this is called a '*collection-complex*':

> Here, the various concrete objects are united in accordance with a single feature, namely, on the basis of reciprocal supplementation. These objects form a unified whole consisting of heterogeneous, though supplementary, parts. ...
>
> The most frequent form of generalization of concrete impressions that the child's concrete experience teaches him is a set of mutually supplementary objects that are functionally or practically important and unified. Sets such as the cup, saucer and spoon, or the fork, knife, spoon and plate, or sets of clothing are good examples of the kinds of complex-collections that the child encounters in his daily life (LSVCW v. 1, p. 138-9).

and Vygotsky was able to reproduce this kind of complex in the 'double stimulation' experiment:

> Under experimental conditions, the child selects objects to match the model that *differ* from it in color, form, size of some other feature. However, the child's selection of these objects is neither chaotic nor accidental. Objects are selected in accordance with features that differentiate them from the model (LSVCW v. 1, p. 138).

So the child endeavours to collect together a complete set of all the colours or all the shapes, and so on, like 'mummy bear, daddy bear and little baby bear'.

These two types of complex exhibit in the most basic form, the two fundamental psychological processes entailed in the formation of complexes and presupposed by conceptual thought. These two processes are the ability to abstract a single feature from a complex whole (analysis), and the ability to gather things together into sets of some kind (synthesis). The second type, the collection-complex, does not necessarily entail abstraction of a common feature from the individual components. What unites the individual objects subsumed in the group may be their making up a 'complete set' or their belonging to things used in the same practical task, such as eating a meal or getting dressed. What is important is the *synthesis* of this collective and its isolation. Which is the odd one out?: (hammer, nail, board, drill)? One might answer drill, because hammer and nail are used to drive a nail into the board, and you can't use a drill for that. Or one might answer board, as hammer, nail and drill all have metal in them and the board doesn't. We see two basic ways in which individual objects can be unified into a category: functional and likeness.

The following two types of complex represent the further development and stability of these processes of analysis (or abstraction) and synthesis, in which the original nucleus is left behind in the formation of the representation of a concrete complex of objects.

Firstly, the *chain complex*, described above in Darwin's observation of his grandson, in experimental conditions:

> The child selects an object, or several objects, to match the model on the basis of some type of associative connection they have with it. The child then continues to select concrete objects to form a unified complex. However, his selection is guided by the features of objects selected in previous stages of this action, features that may not be found in the model itself. For example, the child may select several objects having corners or angles when a yellow triangle is presented as model. Then, at some point, a blue object is selected and we find that the child subsequently begins to select other blue objects that may be circles or semicircles. The child then moves on to a new feature and begins to select more circular objects (LSVCW v. 1, p. 139).

Then we have the *diffuse complex*. Here the child unites objects according to empirical connections between objects, but *extended* into domains in which the child has no practical experience. The attempt by the child to unite objects according to a common feature, therefore becomes more and more diffuse, somewhat like the family resemblance between people sharing more or less remote family connections. In the 'double stimulation' experiment:

> Given a yellow triangle as a model, for example, the child selects not only a triangle, but a trapezoid. With its sharp angles, the latter reminds the child of the triangle.
> Subsequently, a square is affiliated with the trapezoid, a hexagon with the square, a polygon with the hexagon and finally a circle with the hexagon (LSVCW v.1, p. 141).

In everyday life, "What is unique to the diffuse complex is that it unifies things that are outside the child's practical knowledge. The result is that the connections which provide its unity depend on false, vague, and undefined features" (LSVCW v. 1, p. 141).

We see here how the child's as yet imperfect ability to abstract common features from perceived objects, hold those features stable and recognise them in other objects, and synthesise collections accordingly, leads to the child forming complexes which are not yet sufficiently stable and precise to form a reliable basis for action and communication. The crowning achievement of this line of development is the pseudoconcept, the

distinguishing feature of which is that the abstraction and synthesis of objects or situations is *directed by a word in the adult language*. Here the abstraction of common features, whether from the field of practical action or from the field of sense perception, reaches a sufficient degree of precision and stability that the child is able to form groups of objects or situations which, within the bounds of their own experience, match those that adults indicate with the same word.

> The pseudoconcept is the most common form of complex in the preschooler's real life thinking. It is a form of complexive thinking that prevails over all others. It is sometimes the exclusive form of complexive thinking. Its wide distribution has a profound functional basis and significance. This form of complexive thinking gains its prevalence and dominance from the fact that the child's complexes (which correspond to word meanings) do not develop freely or spontaneously along lines demarcated by the child himself. Rather, they develop along lines that are preordained by the word meanings that have been established in adult speech.
>
> It is only in the experiment that we free the child from the directing influence of the words of the adult language with their developed and stable meanings (LSVCW v. 1, p. 142-3).

The crucial point here is that because the child and an adult indicate the same things with the same word, not only is communication between adult and child now maximally effective, but the adult may be unaware that the child actually means something quite different:

> The child formed a complex with all the typical structural, functional, and genetic characteristics of complexive thinking. For all practical purposes, however, the product of this complexive thinking corresponded with the generalization that would have been constructed on the basis of thinking in concepts.
>
> This correspondence in the result or product of thinking makes it extremely difficult for the researcher to differentiate between cases where he is dealing with thinking in complexes and those where he is dealing with thinking in concepts (LSVCW v.1, p. 143-4).

So difficult in fact that no cognitive psychologist or analytical philosopher before Robert Brandom has ever even noticed the difference. This point cannot be fully clarified however, until we have dealt with true concepts. For the moment, we just need to note some distinguishing features of this mode of thinking, which reaches its high point in pseudoconcepts, in which a complex has been associated with a word from the adult language, accurately reflecting the concrete features of the objects and situations indicated by the word, within the bounds of the child's limited experience.

Firstly, the complex is composed exclusively from the empirical features abstracted from concrete practical or sensuous experience with the objects. In this sense it is like the 'concept' defined by cognitive psychology as a mirror image of a category of objects, representing the concept's 'extension', united by a bundle of contingent attributes.

Secondly, perhaps *unlike* the concept of cognitive psychology or analytical philosophy, the complex is a *concrete* mode of thinking. That is, the child who has formed a group of objects according to some common feature (for example their trapezoidal shape) does not thereby necessarily have a concept corresponding to that common feature (for example, the concept of a trapezoid). All we know is that the child is capable of picking out shapes according to their trapezoidal shape whenever new objects are present to her. That is, the abstraction process involved in singling out this feature is still merely

implicit in the performance of grouping objects according to a complex. But an adult observer can see that the selection process is based on this or that feature. We must all have had the experience of meeting a person for the first time, and recognising them immediately as the sister of someone we already know, but without being able to say exactly what it is about the person which makes them so recognisable. Being able to make an association does not necessarily mean being consciously aware of the basis of that association.

In this precise sense, complexes up to and including pseudoconcepts are *concrete* thought-forms. Such thought-forms exist as forms only by implication, thanks to someone else observing a child's behaviour perhaps, and not as a look-up table of features or as a series of ideals or exemplars, as supposed by cognitive psychology. Nonetheless, it can be seen that in the context of an experimental set-up, a subject who is thinking in terms of complexes, may exhibit behaviour *as if* they held such look-up tables or exemplars in their mind. In this sense, for children at this stage of cognitive development, the most rigorous cognitive psychology, which does not claim the actual existence of such formations in the mind, but merely that people act *as if* they existed, is validated by Vygotsky's analysis up to this point.

Even less does use of a pseudoconcept suggest the existence of a dictionary definition, specifying in words, the necessary features of an object. This was demonstrated in the example concerning interpretation of a painting, given at the beginning of this chapter. Being able to define a concept is a high level cognitive and linguistic task.

One final note before moving on from consideration of complexes and pseudoconcepts in particular. Although we have presented this idea chiefly in the context of child development, it is by no means the case that pseudoconcepts are solely a feature of ontogeny, that is to say, of the development of an individual person's psychological functioning during childhood. Vygotsky makes it clear that as adults, many of the words we use in everyday life are signs for pseudoconcepts, and often we do not have true concepts of the entity or situation indicated by the word in its most fully developed form. Further, in day-to-day life adults frequently make a transition *back* from true concepts to concrete concepts, in dealing with concrete instances of a concept (LSVCW v. 1, p. 155), when the concept under which an object or situation was first understood, recedes into the background.

Also, Vygotsky points out that the development of word meaning in history, its etymology, also exhibits the processes discussed under the heading of complexes. For example, the word for raven [*voron*] is at the root of the word for black [*voronoi*], so the word for black carries traces in its etymology of a complex in which things resembling the raven by just one of its features, its black colour, took on a meaning at the centre of which was the raven. In English we are familiar with this phenomenon. Parliament, for example, is a place for talking, as suggested by the French root *parler* to talk, while the Legislature refers to the same body, but this time by the feature of being a proposer of laws, as indicated in the Latin root, *legis*. Thus the development of concepts, as indicated by the traces left in the etymology of the words acting as signs for the concept, exhibit the same features of complexive thinking. This by no means implies that the individuals who first formulated the concept thought in complexes. Not at all! The invention of concepts which enter the language and are sustained as words in the language for centuries, is the paradigm of true conceptual activity. But the traces fixed

in etymology demonstrate homologous activity in the process of embedding the word in the language.

This brings to a close all that will be said here about complexes and pseudoconcepts, other than to point out that there is no road forward from the perfectly formed pseudoconcept directly to the true concept. A true concept is simply nothing to do with combinations of features abstracted form the perceptual field, even though, to recognise something, we rely on the perception of certain combinations of features and the association of the concept with those features. As Dewey put it: "Recognition is perception arrested before it has a chance to develop freely ..." (Dewey 1934 , p. 570). Or we may be obliged to resort to criteria to determine a concept for the purpose of making bureaucratic decisions of various kinds. At such points we relapse from a true concept to the masquerade of pseudoconcepts and the minefield of misrecognition entailed in the use of pseudoconcepts. No amount of tweaking of contingent attributes can lead us to a definitive definition of a true concept. The move to the concept is a *leap*.

Potential Concepts and Preconcepts

Vygotsky identified two more phases in the development of thinking towards concepts which facilitate the transition to thinking in concepts. These were *potential concepts* and *pre-concepts*. These forms of action fall short of true concepts because, unlike true concepts, they are not utilised with conscious awareness. However, in other respects these forms may exhibit a sharp break from pseudoconcepts, and mark a transition from thinking in complexes to thinking in concepts. It seems that Vygotsky takes preconcepts as representing a distinct stage in the genesis of concepts, while potential concepts he sees as 'pre-intellectual'.

Potential concepts are, according to Vygotsky, pre-intellectual forms of activity which people share in common with most animals. It is like a pseudoconcept (though in animals it may not be formed under the direction of the adult human language) but it is not formed as a combination of features abstracted from the field of perception. On the contrary, the potential concept is the significance of the object, situation or event for practical action, as a sign or signal for some action which has become a *habitual* response to the *whole given situation*. That is, it has a *functional* meaning (LSVCW v. 1, p. 158).

> If we consider the child's first words, it becomes apparent that they are similar in meaning to these potential concepts. They are potential, first, because of their *practical relatedness to a certain circle of objects*, and, second, because of the *isolating abstractions* that underlie them. They have the potential for being concepts, but this potential has not been realized. ...
>
> Earlier, we introduced examples indicating that a new word arises through the isolation of some single feature that strikes the observer and serves as the basis for the construction of a generalization of a series of objects that are named or designated by a single word. Potential concepts often remain at this stage of development, not making the transition to true concepts. Nonetheless, they play an extremely important role in the development of a child's concepts. It is in the potential concept, in the associated abstraction of distinct features, that the child first destroys the concrete situation and the concrete connections among the object's features. In this process, he creates the prerequisites for the unification of these features on a new foundation. Only the mastery of the processes of abstracting, combined with the development of complexive thinking, can lead the child to the formation of true concepts, that is, to the fourth and final phase in the development of the child's thinking (LSVCW v.1, p. 158-9).

So we can see here that Vygotsky intends the potential concept as a mode of action which arises from the child's practical activity (which is how these forms may be shared with animals, who are capable of developing habitual responses to regular stimuli). In that sense, the potential concept has its partner in the collection-complex, where objects are grouped according to complementary functional significance. Because of the practical and functional significance which the child attaches to an object or situation, the potential concept can form the starting point for the formation of a true concept. The child can use the ability to abstract, fostered in the development of complexes, and the ability to be guided by the words of adults, utilised in the pseudoconcept, to fix what is to all intents and purposes a true concept. It falls short of a true concept because it is limited in its formation and use to practical interactions within the child's environment. Consequently, the child is not aware of the potential concept as a concept. It just functions as the stimulus for a conditioned reflex. Nonetheless, the potential concept bears many of the features of a true concept and may form the foundation for true concepts if freed from the immediacy of the concrete situation.

Pre-concepts form only in older children, typically those who are already attending school and being confronted with school-like tasks, or engaged in social activities including processes such as measuring, buying and selling, calculating time, and so on. Such activities oblige the child to use culturally transmitted symbols of some kind (not necessarily numbers, for example coins or measuring sticks) to carry out processes requiring the abstraction of features from a concrete situation. These will be quantities in the Hegelian sense, i.e., qualities that which may change without changing what the thing itself is. These are the type of processes Vygotsky mentions, but I think it is likely that preconcepts are involved in learning the rules of games. This kind of activity requires the child to abstract features from a situation and treat them as an object within the bounds of a finite circle of activities or setting. In the 'double stimulation' experiment, it has been suggested that the artificial concepts created in the laboratory setting may make the transition to pre-concepts when they are used in a different context. For example, the nonsense word for round-short may be applied to candles or glasses of that shape. Towsey and Macdonald found that the success in transferring the artificial pseudoconcepts to candles or glasses increased sharply among subjects of 11- to 13-years-old. Note that by "pre-concepts" Vygotsky does not mean all those thought forms used prior to the formation of true concepts. Rather he meant just certain types of the immediate predecessors of true concepts.

Preconcepts differ from true concepts in as much as those using them are not aware of them as concepts. Initially a child learns to handle numbers without having a concept of number. But out of their earliest concept of number, as a preconcept, a true concept may be constructed, by the child becoming aware of their own mental operations using the pre-concept. And there is nothing of the shared attribute or functional relation in preconcepts like number. Children may arrive at the use of preconcepts via the use of pseudoconcepts and potential concepts, but a preconcept is already a leap from complexive thinking.

Nonetheless, it is worth pointing out that machines, as well as very young children who lack any life experience outside the family home, are capable of *logical operations* by means of preconcepts. It may be very tough, when you are playing chess with a child master, for example, a precocious 10-year-old, to say that the child has not yet mastered true conceptual thought. Or watching youngsters solving Sudoku puzzles, evidently using advanced reasoning skills, or stepping in to solve their parents' computer

problems. The fact is that preconceptual thought may reach a very high level of logical sophistication without ever forming a true concept.

Logical thinking necessarily takes place within a framework of judgments which are constituted by a concept, but a preconcept is ideally suited for the display of logical thinking. By 'logical thinking' I do not mean dialectical thought, but the kind of formal logical reasoning normally intended by this term. This kind of reasoning only works within a finite world of yes/no relations, the kind of universe taken for granted by cognitive psychology and analytical philosophy, and ridiculed by Stephen Toulmin in his "Philosophy of Science" (1953). Once the domain of reasoning is the infinite domain of human culture and history, this kind of finite, formal logical reasoning is inadequate. For that one needs true concepts.

Conclusion

What we have seen is that Vygotsky traces the development of a number of distinct psychological functions which are presupposed in achieving the ability to use true concepts.

(1) Manifested in the child's syncretic actions, is the simple ability to isolate objects from their background, name them and use this name in future interactions with their environment.

(2) The ability to isolate (or abstract) from a concrete object or situation one perceptual feature which can be used to recognise the object or situation and/or relate it to others.

(3) The ability to synthesise diverse objects and situations into collections or diffuse groupings sharing something in common, and operate with such concrete groupings by recognising members and adding new members in subsequent experience.

(4) The ability represent functional sets of objects, and isolate individual objects according to their functional significance, rather than their appearance, in some system of practical activity within the child's experience. This was reflected in the 'double stimulation' set-up by the formation of 'complete sets' of objects.

(5) The ability to use words used by adults to guide the isolation of objects or situations and their composition into pseudoconcepts – collectivities with the same reference as adult concepts.

(6) The ability to develop an habitual response to objects or situations connected to their practical significance for the child, which, should the child become consciously aware of this potential concept, may develop into a true concept.

(7) The ability to carry out reasoning operations within a finite system of relations, in which preconcepts, implicit in operations such as counting and calculating, are formed. However, the preconcept is an abstract thought-form and differs from all the earlier acts of thinking which are concrete.

As each of these psychological functions mature, we are able to engage in the various types of action to which Vygotsky has given names, as types, stages and phases in the genesis of concept formation, and reproduced in the laboratory using the functional method of double stimulation. Each ability evidently entails distinct neural substrates and modes of activity, and all are presupposed in the formation of concepts. Probably the first six of these abilities are accessible to animals other than humans. Many research projects are suggested by these observations of the genesis of concepts in children by Vygotsky.

But up to this point, I have not been able to explain what a true concept is, so the reader might justifiably feel that a degree of unclarity remains with what I have said about complexes, pseudo-, potential and pre-concepts. All that can be said at this point is that Vygotsky was quite insistent that true concepts are inaccessible to the child prior to adolescence. I must now turn to the question of true concepts.

Vygotsky on 'True Concepts'

While Chapter 5 of "Thinking and Speech," Vygotsky's most famous work, focuses on research into the genesis of concepts in children prior to the formation of true concepts, Chapter 6 centres on the research of one of his students, Josephina Shif, into the formation of true concepts in school-age children. This chapter is a rich and complex study of concepts which covers almost the entire range of problems of concepts and their acquisition.

In line with his approach to other problems, Vygotsky did not set out to study all kinds of concept, with all the interminable problems which would arise in differentiating types of concept across such a vast and diverse domain. Rather, Vygotsky focussed on one type of concept, confident that clear results from the study of just one, well-chosen category of concept would resolve the main problems affecting the study of concepts in general.

Scientific Concepts

Cognitive Psychology took the concept of the "common object" (Murphy 2004) as its prototypical concept, but isn't it obvious that the concept of "cat" or "pencil" fails to manifest the whole range of problems of concept formation as indicated for example in the Introduction: concepts such as "mammal," "atom," "the Virgin Mary," "ambush," "differential" and so on.

By taking concepts of common objects as their prototype, cognitive psychology inevitably arrived at the pseudoconcept (described in the previous chapter) as the typical concept, and was incapable of even formulating the problem of the formation of a true concept.

Vygotsky took as his prototype of the true concept the *scientific concept*, such as acquired by an adolescent at school – the "*purest* type of nonspontaneous concept" (LSVCW v.1, p. 177). The scientific concept is a pure example of a true concept because, in the first place, it cannot be formed by the subject through immediate personal experience of the object. Vygotsky frequently quotes the passage from Marx's *Capital*: "If the form in which a thing is manifested and its essence were in direct correspondence, science would be unnecessary" (MECW, v.37, p. 804). Scientific concepts can only be acquired by instruction in science, or in the case of those already aficionados of science, from acquaintance with the scientific literature (postponing for the moment, consideration of those rare moments when a new scientific concept is created).

But this is true also of the concepts of the Christian Church or professional magicians, or other institutions. Why are scientific concepts regarded by Vygotsky as the *purest* type of nonspontaneous concept? The scientific concept has developed over history so as to distance itself more and more from all traces of appearance and immediate perception, and integrated all its concepts more and more into a single system. Science has increasingly purged itself of cultural prejudice and sectional interests, imperfectly perhaps, but in its essence, in its tendency, science is universal. A certain *style* of science may be characteristic of a certain culture, but in essence science is universal. A scientific concept is the pure product of an institution, namely the scientific establishment. But science is unlike any other institution. Science is based on no faith, admits of no axioms, no revelations, no "clear ideas" or given datum, other than the

ontological principle of the independent existence of a material world and the epistemological principle of the knowability of that material world.

This is not to say that scientific concepts are in some universal sense objectively true. Of course not. Rather, they are the product of a real institution at some particular historical juncture and are always subject to revision. But even though science remains subject to cultural prejudice and conditions, science is not conditional upon adherence to any particular faith or disposition. The point is that *more than any other type of concept* they are not only products of an institution and *independent of immediate personal experience* of a relevant object, but exist only within an entire system of interconnected concepts, outside of which they are meaningless, and presuppose no appeal to moral values or any other kind of intuition or authority. So the scientific concept, more than any other, is a "nonspontaneous" concept. For the novice it is simply book learning. For these reasons, Vygotsky regarded the scientific concept as the paradigm of the true or nonspontaneous concept.

The Concepts of Social Science

Further to this, Vygotsky selected social science concepts alone for research, rather than natural scientific concepts, which, if you were looking for "pure" scientific concepts, would have appeared to be the obvious choice. Vygotsky chose social science concepts because these were most easily made the subject of psychological investigation and facilitated comparison and interaction with spontaneous (or everyday) concepts. But these are not the only reasons.

Piaget had chosen the concepts of elementary physics and the spontaneous or "naïve" concepts which are supplanted by a knowledge of scientific physics. But there is no hard line between naïve physics and scientific physics, as was discussed earlier when we considered the work of conceptual change research. Simple concepts of momentum, conservation of matter and so on, can be confirmed in immediate experience, without reliance on book learning. But it is "book learning" which is *essential* to the scientific concept and which is most distinct from everyday knowledge. Likewise with mathematics. The elementary concepts of counting and measurement can be acquired by instruction in practical tasks, through the development of the child's spontaneous preconcepts.

The social sciences are not like this. They are connected with everyday experience only with the greatest difficulty and after considerable learning, as part of a whole system of concepts, which is exactly what characterises scientific concepts. In the Soviet Union of the 1920s/1930s, the concepts of social science were "class struggle, exploitation, the Paris Commune, bourgeois, capitalist, landowner, or kulak" (LSVCW v.1, p. 215 & 228). Living today, in times when the concepts of orthodox Marxism are no longer self-evidently concepts of social science, it is abundantly clear that such concepts can only be acquired by means of instruction, that they presuppose a certain level of psychological development and that they are meaningful only within an entire system of concepts. No suspicion can linger that absolute objective truth is being claimed for scientific concepts. In addition to this, children have everyday concepts of all the topics covered in the social sciences, even though the basis for a 'true' concept is outside the range of their personal experience, and a child's naïve understanding of "capitalist" may be observed even while they have learnt the scientific definition of "capitalist" perfectly well at school. So, such concepts lend themselves particularly well to psychological research.

By scientific concept I mean a concept which can only be acquired by instruction, beginning with a verbal definition, and that such concepts are essentially not given in individual experience. So it must be clear that such concepts cannot be acquired along the path blazed by the child's complexes, pseudoconcepts and potential concepts, all of which are concrete concepts which arise from the child's everyday personal experience without any conscious effort or awareness.

The Method for Investigating Concepts

The method used by Shif for the study of the development of both scientific concepts and everyday concepts in school-age children was to present the child with sentences to complete using causal (... because ...) and adversative (... although ...) clauses. In each case, the sentences were chosen from the child's own speech in everyday life or from classroom lessons. In this way, researchers could be sure that the child was both familiar with the concepts and with the relevant causal or adversative relations. Even at a time when a child is perfectly well able to use causal and adversative clauses in their own spontaneous speech and understand such sentences when used by others, they may be stumped when asked to complete a sentence like: "Kolya fell off his bicycle because ... ." They cannot consciously identify the need to find a prior cause of the event in question. Instead the child will tend to continue the narrative flow of speech with "... he hurt himself" or "... he was taken to hospital." According to Vygotsky, it is about two years after a child learns to freely use causal clauses in action that fluency with spontaneous use of adversative clauses is achieved. But completing a sentence like "Katya ate her dinner although ..." will still prove impossible for another couple of years.

By observing whether a child was able to correctly use a concept in a causal or adversative statement, provided that the child was already using the relevant relation in conversation, Shif was able to determine whether a child had *mastered the concept* and was able to use it voluntarily, with conscious awareness, in their speech. Such a determination is meaningful only to the extent that the child was already able to understand and use causal or adversative relation in spontaneous conversation.

I will return to this research presently, but for the moment it is worth noting how this contrasts with the methods used by Cognitive Psychology which invariably focused on instant responses. The sentence completion tasks oblige the child to reflect on the concept and bring out the extent to which they are consciously aware of and understand the meaning of the concept in question, rather than seeking a superficial response. Further, this research begins where categorisation tasks leave off, by investigating concepts as loci of material inference.

True Concepts and Spontaneous Concepts

In their fullest development, there is no significant difference between the concepts of everyday life and true concepts. The distinction lies only in the origin and course of development of a concept. The kinds of concept we are dealing with here are concepts at one or another point in their development towards the mature concepts of an educated and worldly adult. The complex character of mature concepts is best revealed by understanding the various forms of concept which arise in the course of their development. At the same time, it should be emphasised that any of these forms of concept will figure in the activity of an adult citizen; our thinking is never completely purged of potential concepts, preconcepts and pseudoconcepts.

As mentioned above, the scientific concept offers the purest example of a true concept. But all other concepts which are consciously acquired through deliberate instruction in some institution where the concept is part of a whole system of concepts, reflecting the social practices of the institution in question, must be regarded as true concepts. Nonetheless, I will continue Vygotsky's practice of taking the concepts of Marxist social science as the paradigm of a true concept, and refer to them as 'scientific concepts'. This has the added advantage of relieving us of having to deal with logical positivist or analytical definitions of concepts which are to be found in natural science. Vygotsky was a Marxist, and he brought the same understanding of the concepts of social science as he brought to psychology. In a strong sense, the pseudoconcept belongs to formal logic, analytical philosophy and Set Theory, whilst the true concept and its development belongs to dialectical logic.

Vygotsky made very clear his commitment to dialectical logic both by his frequent citing of philosophical works by Engels and Lenin, in particular Lenin's Annotations on Hegel's *Logic*, and explicitly, for example when he says:

> When applied in the domain of life experience, even the concepts of the adult and adolescent frequently fail to rise higher than the level of the pseudoconcept. They may possess all the features of the concept from the perspective of formal logic, but from the perspective of dialectical logic they are nothing more than general representations, nothing more than complexes (LSVCW, v. 1, p. 160**)**.

Part II of this book, dealing with Hegel, may function as an introduction to dialectical logic. Dialectical logic is in fact nothing more than the art of dealing with concepts, that is, *true* concepts, rather than simplified, impoverished pseudoconcepts. This author conducted a 3-day workshop in May 2011 with research staff, in which Socratic dialogue was used to explore concepts such as Poverty, Justice, Absolute and Relative, Cause and Effect, Dependence and Independence and so on. With an educated, philosophically sophisticated group like this it was possible to bring out the complex structure of mature concepts without any appeal to "laws of dialectics" or references to Hegel, but simply by immanent critique of the concepts taken one at a time. From the study of concrete concepts like these, one could abstract the principles known as dialectical logic. By contrast, as a school teacher, I have had occasion to teach elementary Set Theory, a surrogate for formal logic. This is an altogether different matter, with concepts such as round-black or large-square, like those used in the 'double stimulation' experiment described in the previous chapter, functioning as subject matter. Dialectical logic is the art of handling *real* concepts, as opposed to formal logic, which is the rules governing the categorisation of common objects according to yes/no attributes. Because dialectical logic was a well-known idea in the Soviet Union of 1920s and 30s, Vygotsky was able to illustrate the contrast between pseudoconcepts and true concepts.

The Concept and its Definition

One of the most difficult questions in the study of concepts is that of the relation of a concept to its definition, and it is this relation which marks perhaps the clearest distinction between spontaneous concepts and scientific concepts. In the case of everyday concepts, the definition lies only at the end of a protracted process of development. In the case of scientific concepts, development begins with learning the verbal definition. For example,

> The child formulates Archimedes' law better than he formulates his definition of what a brother is. This obviously reflects the different developmental paths that have led to the formation of these concepts. The child has learned the concept of 'Archimedes law' differently than he has learned the concept of 'brother'. The child knew what a brother was, and passed through many stages in the development of this knowledge, before he learned to define the word 'brother' (if he ever had the occasion to learn this). The development of the concept, 'brother', did not begin with a teacher's explanation or with a scientific formulation. This concept is saturated with the child's own rich personal experience. It had already passed through a significant part of its developmental course and had exhausted much of the purely empirical content it contains before the child encountered it in definition. Of course, this was not the case with the concept that underlies Archimedes' law (LSVCW, v. 1, p. 178).

It is a well-established fact that people are generally unable to define words which they use with ease in everyday conversation. This is characteristic of spontaneous concepts. On the one hand, to produce a verbal definition of a concept that a child is quite fluent in using requires a capacity for intellectual introspection not normally attained until adolescence. On the other hand, a child's first acquaintance with a scientific concept will be learning a verbal definition of the concept in school. After learning the definition and successfully committing it to memory, and being able to reproduce it on demand, the child will generally still be quite unable to apply the concept in any concrete situation.[*] Vygotsky illustrates the naïve nature of the child's understanding of scientific concepts in the following observation:

> Student: "Serfs were peasants who were the property of the landowners."
>
> Adult: "What was the life of the landowners like under serfdom?"
>
> Student: "Very good. They were all rich. They had ten story houses, many rooms, and were all well-dressed. They had electricity" (LSVCW v. 1, p. 218).

It will take a long time for the student to develop a realistic and concrete understanding of the relation between the classes in pre-Revolutionary Russia, if they ever do so, but they learn the definition of serfdom in a single afternoon at school. And indeed, an understanding of life in pre-Revolutionary Russia would be impossible without such concepts, and given that personal experience of that world is ruled out, it is only through concepts that such an understanding may be attained.

From this it should be clear that a concept differs from its definition, the definition constituting just *one possible realisation* of the concept. In the case of the scientific concept, the definition lies at the beginning of development; in the case of the spontaneous concept, the definition arises only towards the end. In both cases, the concept does not stay as it was when it is first learnt, but develops.

Concepts and word meaning

It is not possible to *know* a concept without the use of words, so it is important to clarify the relation between concepts and that most famous of Vygotsky's ideas, word meaning – the unit of analysis for the study of verbal thinking. A word is a sign for a concept

[*] Doubtless a teacher would make use of any opportunity to build on any relevant experience that the child already has, but in the case of the pure scientific concept this is no such experience. What is described here is an ideal type of development.

(LSVCW v.1, p. 26, v.4, p. 172, v. 5, p. 48, 132). (In saying this, Vygotsky also makes it clear enough precisely what he meant by 'word'). Meaning is an act of both speech and thinking. Word meaning is an act of indicating a concept to another person or oneself. The sense in which a concept is evoked is accomplished through all the expressive capabilities of language, gesture and context.

Vygotsky said that the concept is represented psychologically as word meaning (LSVCW v. 1, p. 169-170). But the important thing is that just as word meanings develop, concepts develop, both ontogenetically in the development of a child and historically in the etymology of a word. Note that Vygotsky is *not* saying that a child's understanding of the meaning of a word develops, or that the word has a meaning which the child gradually comes to know. Rather, he is saying that word meaning is a "*complex and true act of thinking*" (LSVCW, v.1, p. 169) *which develops*, and the psychological form of the concept which is indicated by the word meaning is itself also developing. A word does not itself have any meaning. People make meaning and use the word for the action of meaning-making. So that is why Vygotsky says that the concept is represented *psychologically* by word meaning. The concept is in the first place something that exists objectively, albeit implicitly. It exists in the activities of human beings and the social properties of the artefacts they use. These artefacts include of course words, and words are more or less suitable for expressing one or another meaning, according to the practice of a given language community. But word meaning is not simply objective, but as an action, word meaning is both subjective *and* objective. It is through word meaning that concepts are manifested for the person psychologically. A child's concepts, which differ from the concepts of the adult community, are more idiosyncratic and still imperfectly socialised. The concepts of the adult community, which are true concepts, are truly functions of the entire language community. The child's concepts on the other hand are more personal and underdeveloped. The child's concepts appear coincidentally with the child's first use of words, as described in the previous chapter. Adult concepts begin to emerge to the degree that the adolescent begins to participate in the affairs of the world at large.

This is how Vygotsky resolved the problem of whether concepts should be regarded as mental images, or some other kind of internal representation, on the one hand, or on the other hand, should be regarded as something "out there" in the world, something objective. A concept is evoked by an individual action, which is a more or less developed form of generalisation, manifested in word meaning, which more or less corresponds to the word meanings of adult speech, which through the actions of many individuals, sustain all the various institutions of the community.

Concepts and Problem-Situations

Concepts arise within some specific social practice in the form of a problem, and a solution (Vygotsky *CW*, v.1 123-4, 127; 1994, p. 257-8). In some social situations it would be more true to say that the discovery of a *solution* gives rise to the identification of the *problem*. But a concept always, in one way or another, names a problem-solution relation, a situation, and only arises in the course of an effort to solve a problem. Such problems can only arise within some definite *system* of social practices. In the case of true concepts, a new word (or new usage of an old word) enters into the discourse of the relevant social practice or institution and may subsequently make its way into the language and participate in restructuring the social practices of the larger community and everyday life.

A child's concepts also arise only in the context of the child's efforts to solve some problem, and it was this understanding which was behind the design of the 'double stimulation' experiment. Ach had also designed his version of the experiment on the understanding that the formation of a concept depends on the child's effort to solve some problem, rather than by passive association. Sakharov and Vygotsky modified the experiment so that the child could express their efforts at solving the problem practically, in the selection and arrangement of blocks and could *use* the word as part of the problem-solving exercise.

> There is no experimental support here for the old idea that the concept arises through associative processes, through the reinforcement of the associative connections that correspond to the features common to several objects and through the weakening of the connections that correspond to the features with respect to which these objects differ.
>
> Ach's experiments show that concept formation always has a productive rather than reproductive character. They show that the concept arises and is formed in a complex operation that is directed toward the resolution of some task (LSVCW v. 1, p. 123-124).

In the case of the child's concept, the problem is always one arising within the social situation in which the child's needs are being met in immediate collaboration with their parents or carers, that is, more or less within the self-enclosed circle of the child's system of protection and support. If such a system of care is lacking then this is a pathological situation and concept formation will be distorted.

The true concept, however, has arisen in some situation quite remote from the individual in time and space and is brought into the present situation by cultural means, through the social fabric of the larger society. Only to the extent that the individual is engaged in the problems of the community and the various projects making up that community, does the opportunity to acquire a true concept arise. This includes practices functionally created for the induction of people into an institution or institutionalised social practice, such as formal schooling or apprenticeship in some profession.

> The tasks that are posed for the maturing adolescent by the social environment – tasks that are associated with his entry into the cultural, professional, and social life of the adult world – are an essential functional factor in the formation of concepts. Repeatedly, this factor points to the mutually conditioned nature, the organic integration, and the internal unity of content and form in the development of thinking (LSVCW v. 1, p. 132).

The difference is that the solution to the problem which has been posed for the adolescent is not to be discovered by the adolescent himself, but has to be transmitted to him from those who have confronted the situation previously and created the concept which encapsulates the problem and its solution. I will deal with the question of the cultural creation of true concepts in the next chapter, but a fine illustration of the origin of concepts in problems confronted earlier within a definite social practice was given in Chapter 3 when I reviewed the various distinctions in the understanding of word meaning known to linguistics. Each of the seven distinctions listed originated in a dispute within the linguistics community. In each case the dispute was settled at the conclusion of a protracted academic debate amongst linguists by the formation of two opposite, mutually constituting concepts. The conditions for the creation of these concepts simply do not exist for the person who comes across the relevant problem at some point in their professional life. They have to be introduced to the concepts by means of instruction of some kind in which the word acts as an indispensable carrier of the wisdom of the past, around which an understanding of the concept can be organised,

connecting up the concept with the whole array of concepts entailed in the relevant discipline or activity.

A child forms a pseudoconcept in order to solve some problem, solved by identifying a category of objects being referred to by adults. An adolescent who is being inducted into some profession, learns to identify a certain class of problem and the appropriate approach to resolving the problem. In both cases, it is the stimulus to solve the problem which opens the way to the formation of the concept. It should be noted however that while the problem situation constitutes a pre-condition for concept formation, it should not be seen as the *basic mechanism* of concept formation (LSVCW v. 1, p. 132) which is to be found in instruction. True concepts cannot arise spontaneously in response to some class of problem-situation. At the same time, *direct instruction* in a concept is impossible, and can only lead to the memorisation of a form of words.

> The teacher who attempts to use [direct instruction] achieves nothing but a mindless learning of words, an empty verbalism that simulates or imitates the presence of concepts in the child. Under these conditions, the child learns not the concept but the word, and this word is taken over by the child through memory rather than thought (LSVCW v. 1, p. 170).

Scientific concepts have a different relation to their object than do complexes.

> the birth of the scientific concept begins not with an immediate encounter with things but with a mediated relationship to the object. With the spontaneous concept, the child moves from the thing to the concept. With the scientific concept, he is forced to follow the opposite path – from the concept to the thing (LSVCW v. 1, p. 219).

The person who knows a scientific concept must make an effort to discover the object represented by the concept, which is not given immediately. Despite being familiar with the definition of the concept and its relation to other concepts, we may still be quite at sea in understanding the object being referred to, like a young medical graduate entering their first internship at a hospital. The child's complex, on the other hand, is abstracted immediately from their perception of the object, with the aid of the word.

Every stage in the development of concepts corresponds to different kinds of generalisation. We have seen this in the development of the child's concepts in the previous chapter. The true concept introduces entirely different kinds of generalisation which in general do not depend on the perceptual or other attributes of objects or events whatsoever. Concepts indicate objects according to their significance in various human projects, which may not be connected with any attribute of objects indicated by the concept. Lakoff's discussion of the meaning of the word "fake" discussed in the first chapter is a good illustration of this fact. True concepts are first and foremost units of social life manifested in the actions of individuals. They reflect objects only in a mediated way, through how the object figures in social life. Understanding of the object in accordance with a true concept is mediated by the person's participation in society.

The Development of Concepts

A concept begins with a word, but "when a child first learns a new word, the development of its meaning is not completed but has only begun" (LSVCW v. 1, p. 170). This applies both to the spontaneous concepts of the child and to the scientific concept of the adolescent. But the development of the spontaneous concept and the development of the scientific concept take place in opposite directions:

> The development of scientific concepts *begins with the verbal definition.* As part of an organized system, this verbal definition descends to the concrete; it descends to the

> phenomena which the concept represents. In contrast, the everyday concept tends to develop outside any definite system; it tends to move upwards toward abstraction and generalization (LSVCW, v.1, p. 168).

The experiments of Josephina Shif demonstrated that even though a child may be perfectly familiar with the concept of 'brother', they are unable to provide a satisfactory verbal definition of the word, complete causal or adversative sentences, solve problems like the 'brother's brother', and, in general, are unable to use the concept in an abstract context, for a long time. By the time a child is able to solve the 'brother's brother' the concept they have of brother is no longer a spontaneous concept, but has been modified under the influence of structural changes in their thinking, such as schooling.

Conversely, an adolescent who has learnt perfectly well the concept of dative case in German may be quite unable to apply the concept in German conversation, just as the medical student makes elementary mistakes in diagnosis despite their familiarity with the diagnostic manual, which they manifested in their examinations. The scientific concept is acquired in the form of a verbal definition, that is to say, as an abstract definition. But a person needs to work correctly with the concept in concrete situations, recognise when it is appropriate and when it is out of place, and know how far to take a relation when confronted with a real situation – this takes time. A scientific concept may be altogether out of place in an everyday situation, as when a psychology student diagnoses their friends and family with all sorts of psychiatric disorders or a chemistry student tries to utilise their scientific knowledge in the kitchen.

This is the most striking difference between the scientific concept and the spontaneous concept: one begins with an abstract verbalism and only over time becomes realistic and concrete; the other begins in real interaction with its object and only later can the concept be applied correctly in other contexts or in the solution of abstract problems.

Shif's experiment showed that the scientific concept develops *faster* than the spontaneous concept in that a school-age child who freely uses a concept like 'brother' or 'bourgeois' but could not complete a sentence with a causal or adversative clause, acquired this ability more quickly and easily in the case of the scientific concept. This may seem surprising, as the child is far more at ease with the spontaneous concept which they have used in concrete situations from a young age, whilst the scientific concept they learnt only last week. But the point is that the child is *consciously aware* of the scientific concept (such as 'ideal type' or 'surplus value'), *as a thought form* distinct from the object it represents and which they have acquired with great effort. On the other hand, in the case of the spontaneous concept, the child is not really aware of the difference between the thought form and the object, having acquired the concept without any conscious effort, and the intellectual introspection required to operate consciously with the concept (for example completing a causal sentence) is still beyond his or her reach. This ability will appear only over time, if at all, and does not arise spontaneously but has to be acquired through some kind of instruction.

A spontaneous concept can develop towards greater degrees of generalisation, more precise abstraction of attributes and grouping of objects in accordance with more objective attributes matching with ever greater precision the categories of objects indicated in adult speech. The child learns eventually to apply concepts in situations more and more remote from the situation in which the concept originated, gradually freeing themself from the concrete context. The final stage in Towsey and Macdonald's replication of Sakharov's experiment was the subject's ability to use a word learnt in the

experiment with blocks to categorise candles. This freedom from concrete context, is as far as the child can go with the development of concepts.

The child's concept can match but cannot spontaneously transcend the kind of categorisation procedure represented mathematically by Set Theory. Nor can spontaneous concepts form themselves into a system. For the child, concepts of different levels of generality exist side by side, with the concept of 'flower' standing side by side with the concept of 'rose'. The child can correctly use the concept of flower, inclusive of rose as well as other types of flower, but cannot solve logical problems depending on the fact that a rose is a flower.

In fact, spontaneous concepts develop beyond the bounds of pseudoconcepts only by structural interaction with the development of true concepts acquired through instruction of some kind.

From what has been said, it might appear that spontaneous and true concepts are two entirely different kinds of formation, but this is not the case.

> These two types of concepts are not encapsulated or isolated in the child's consciousness. They are not separated from one another by an impenetrable wall nor do they flow in two isolated channels. They interact continually. This will inevitably lead to a situation where generalizations with a comparatively complex structure – such as scientific concepts – elicit changes in the structure of spontaneous concepts. Whether we refer to the development of spontaneous concepts or scientific ones, we are dealing with the development of a unified process of concept formation (LSVCW v. 1, p. 177).

Although spontaneous and nonspontaneous concepts are different in their relation to the object, and constitute two different kinds of concept, both function within a unified formation of consciousness (i.e., mind). There is mutual interdependence between spontaneous and nonspontaneous concepts, in the determination of a person's actions.

Both types of concept develop within a unified structure, and consequently, gains made in the acquisition of one type of concept cannot but influence the development of all other concepts. Qualitative developments in the use of concepts are transferred from one kind of concept to another through structural changes in consciousness.

It is self-evident that scientific concepts cannot be acquired without the support of a child's spontaneous concepts. Everyday concepts and word meanings provide the only foundation upon which the verbal explanation of a scientific concept can be grasped. But in any case, scientific concepts cannot be grasped until spontaneous concepts have developed within the child's sphere of activity to the point where pseudoconcepts are fully developed and the child has developed preconcepts and potential concepts across a range of relevant subject matter. Scientific concepts are built on this foundation. Otherwise, nonspontaneous concepts will be nothing more than a kind of naïve dogma and verbalism.

But the interaction between spontaneous and nonspontaneous concepts also takes place in the other direction, with book learning accelerating growth in understanding of everyday concepts. This was graphically demonstrated by Shif's experiments. When young school-age children were given the test with "because" sentences, they were able to correctly complete sentences based on lesson material with scientific concepts earlier than they were able to do so with concepts taken from everyday life, but two years later, their ability with spontaneous concepts had caught up to their ability with scientific concepts. At the same age-levels, their ability with "although" sentences with scientific concepts lagged behind their ability with "because" statements. At the older age-level,

however, ability with “although’ lagged only slightly behind their ability with causal relations in the case of scientific concepts, whilst in the case of spontaneous concepts, it was greatly improved, but still lagged substantially behind that with causal relations.

The implication of this is that instruction in scientific concepts, which the child meets in the form of abstract, verbal definitions, as part of a system of related concepts, makes the solution of abstract problems such as the sentence-completion relatively easy. Little more than regurgitation of classroom speech is required. But this ability to move from concept to concept according to an understanding of causal and adversative relationships, acquired with relative ease in the context of book learning, is then *transferred* to spontaneous concepts. A couple of years after answering that prices rose ... because of a shortage in supply, they are able to answer that Kolya fell off his bicycle ... because he was careless.

As was mentioned earlier, the development of scientific concepts depends on the adolescent’s concept moving from the pages of a book or a verbal definition, to the activity of the adolescent in a concrete situation. This means that the highest development of a scientific concept is dependent on the level of development of everyday concepts. How often do we hear that X is a very learned fellow, but lacks practical common sense, but while Y did not do well at school she has good common sense. The lack of ‘common sense’ is generally a symptom of insufficiently concrete thinking. A person who already has a good, practical capacity to handle complex situations intelligently, if they are able to integrate scientific knowledge into their activity, will attain the highest level of application of scientific concepts. This kind of concrete thinking cannot be attained via book learning alone.

Vygotsky calls ‘*actual concepts*’ the concepts which arise in the course of the person’s real life development in contrast to the concepts identified in experimental work such as Sakharov’s. The concepts of the mature adult are ‘actual’, in contrast to the abstract idealised of newly learnt scientific concepts, which have not left the classroom and are untouched by experience, and in contrast to the child’s spontaneous concepts, which have not left the home and are unaffected by contact with the wider world. The knowledge of the worldly and educated adult is reflective of *actual* concepts in another sense. In general, all our concepts owe their origin both to education and everyday life, and in reference to the real activity of mature adults (not their opinions about matters which are in fact outside of their experience), all concepts are of this nature and we cannot talk of two kinds of concept. That is, all our *actual* concepts owe their origin to *both* instruction *and* life experience, and in their structure demonstrate traces of both origins. ‘Actual’ means concepts which reflect a concrete understanding.

Conscious Awareness

The most marked difference between the true concept, including the social science concepts acquired via book-learning at school, and spontaneous concepts – pseudoconcepts and potential concepts – acquired effortlessly by the child in the course of everyday life, is that the true concept is marked by *conscious awareness* [Russian: *osoznanie*]. Vygotsky offers the following simple explanation of the meaning of ‘conscious awareness’:

> I tie a knot. I do it consciously. I cannot, however, say precisely how I have done it. My action, which is conscious, turns out to be lacking in conscious awareness because my attention is directed toward the act of tying, not on *how* I carry out that act.
> Consciousness always represents some piece of reality. The object of my consciousness

> in this example is the tying of the knot, that is, the knot and what I do with it. However, the actions that I carry out in tying the knot – what I am doing – is not the object of my consciousness. However, it can become the object of consciousness when there is conscious awareness. Conscious awareness is an act of consciousness whose object is the activity of consciousness itself (LSVCW, v.1, p. 190).

Conscious awareness is a feature not just of concepts, but of all psychological functions. In general, conscious awareness of a psychological function is attained only with a high level of development of the function. It stands to reason, that you must first be able to ride a bicycle before you can be aware of your pedalling, and the same is true of attention, memory and perception. Conscious awareness of a function is a precondition to voluntary control and thus mastery of the function.

On the other hand, true concepts are only acquired with *conscious effort*, so they are characterised by conscious awareness from the beginning. In this aspect true concepts differ sharply from spontaneous concepts, including the pre-concepts which are acquired in pre-school or early school years. Spontaneous concepts are acquired without conscious effort, and therefore without conscious awareness or the possibility of voluntary control.

It should be noted that lack of conscious awareness is quite different from Freud's concept of the Unconscious. In the example cited above, I am perfectly aware that I am tying a knot, but my attention is on the tying of the knot, not the separate operations which make up this action. Likewise with memory, at first the child is not aware of the *act* of memory required to recall something, they just know it or don't know it. But at a certain point, the child learns to remember things by applying conscious effort to recalling where he was yesterday or remembering where he might have left his socks, or committing a telephone message to memory.

In this context, we should observe that what someone thinks they are doing with a concept or how they might define it, is not at all the same thing as how they actually use the concept. Complete mastery of a concept, and conscious awareness of its application in this or that context or mode of activity, is something which is attained only after considerable time and effort. In general, an educated adult will have only a vague notion of how they use a concept that is not within their area of professional expertise. But this is not to say that they use a concept 'unconsciously'. The verbal introspection which is required to make an object of their own intellectual activity is an acquired skill, which is built on conscious awareness, but is not exhausted by conscious awareness.

Conscious awareness is therefore not a factor characterising a child's entire psychological functioning, but is an advanced step towards volitional use and mastery of a *given psychological function*. According to Vygotsky, "when the child reaches school age, they have comparatively mature forms of attention and memory at their disposal. He has what he must now gain conscious awareness of and master" (LSVCW v.1, p. 189). Conscious awareness of concepts may follow on after a child has gained mastery of attention and memory.

Of course a child can remember and knows whether they remember or not, but *knowing how* to memorise is a skill which arises only later, with effort and the use of *technique*. A child can attend to something ... until they are distracted, but attending to something beyond the time in which it holds their interest is an achievement of the school-age child, and the discipline of formal schooling. Conscious awareness in respect to

concepts means a capacity for verbal introspection, or *meaningful perception* of one's own thinking. Vygotsky explained it this way:

> It is well known that the most important change in external perception during [the transition from infancy to early childhood] is that the child makes the transition from nonverbal and therefore nonmeaningful perception to meaningful and verbal object perception. The same can be said of introspection at the beginning of the school age. The child makes the transition from nonverbal to verbal introspection. He develops internal meaningful perception of his own mental processes (LSVCW v.1, p. 190).

This much is surely clear: that the school child who learns a scientific concept in class and then does exercises with it, has conscious awareness of the concept, and the young child who as yet does not clearly distinguish between an object and its name cannot have conscious awareness of their concepts. Since an 8-year-old does know that carelessness could cause Kolya to fall off his bicycle, why is he quite unable to complete the sentence: "Kolya fell off his bicycle because ..." and suggests instead "... he broke his arm"? He is not consciously aware of using the formal or the material inferences (see p. 64 above) entailed in the concept of carelessness, when he says in spontaneous conversation that "Kolya fell off his bicycle because he was careless," even though he knows this as a fact. If asked about it, he cannot analyse his comments down to the component concepts, just as he could not describe the actions by means of which he ties his shoelaces without turning his attention to these operations.

It is commonly held that conscious awareness marks the *beginner* stage of a psychological function, not mastery of it. Consider the case of a child speaking their native language and a child who is learning the language at school. The native speaker uses perfect grammar and is immediately aware of the foreigner's mistakes, but may be unable to distinguish (to use an example from English) between "we're" and "where" or realise that "go" and "went" have the same meaning. The child learning the language at school passes through three stages in the learning of each function. For example, in using the verb "to go" they have to make a conscious effort to remember the different forms of the word used in each tense and consciously choose each word as they speak, but they will be unaware of any mistake or idiosyncrasy in their speech. Next, the child attains "epilinguistic awareness." Now, the learner has become conscious, without being told, of having used a wrong word, and is able to correct their own mistakes, but still with conscious effort. Finally, typically about 18 months later in children learning a new language, the child reaches "metaconsciousness" of the function in question when the correct form of the verb is chosen with ease and without reflection. The sense in which Vygotsky is using "conscious awareness" applies to both "epilinguistic awareness" and "metaconsciousness," since metaconsciousness can be transformed instantly into epilinguistic awareness if, for example, something makes the speaker aware of having made a mistake. The earlier stages, including the effortful stage from which conscious awareness arises is *also* conscious awareness, since it is a necessary part of the process of development of metaconsciousness, or conscious awareness and mastery. The native speaker, on the other hand, might *never* be aware of the norms they are using.

Vygotsky criticised the claim of the Swiss child psychologist Édouard Claparède (1873-1940), who developed the view that lack of conscious awareness was characteristic only of imperfect use of a given psychological function. Claparède claimed that the more we use a given relationship, the lower the level of our conscious awareness of it. We are consciously aware only to the extent that we are unable to accommodate or adapt, as when we trip over the kerb while walking along the footpath. The more extensively a

relationship is used in our spontaneous behaviour, the more difficult it is for us to be consciously aware of it. Claparède further claimed that to become consciously aware of an operation, it must be transferred from the plane of action to the plane of language; it must be recreated in the imagination such that it can be expressed in words. The problem, according to Vygotsky, was how one could become consciously aware of a psychological function at all. Only if conscious awareness has been prepared earlier by the *meaningful perception* of the function in question, could conscious awareness and attention be triggered by some problem. Meaningful perception can only be built on functions already acquired.

> Children respond to actions earlier than to differentiated objects, but they give meaning to or comprehend the object earlier than the action. The action develops in the child earlier than autonomous perception. However, *meaningful* perception leads the development of meaningful action by an entire age grade (LSVCW v.1, p. 184).

By meaningful perception Vygotsky refers to the child's use of words to guide their perception of the perceptual field, and in the same way, children use words as commands to themselves, to guide their actions in solving problems and overcoming difficulties. But even the pre-linguistic infant perceives. The infant perceives holistically, and this is called autonomous perception, just as its bodily functions are called 'autonomous', in that they are regulated without conscious control. The child learns to use words to isolate various objects and analyse the situation, and in this way develops meaningful perception. This explains how it is that a small child can understand the situation depicted a painting, but cannot enumerate the objects depicted. What applies to perception of external images also applies to perception of their own mental activity.

Learning written speech is an important route to conscious awareness of concepts. Writing is an extremely abstract task, lacking an interlocutor and lacking the stimulus to speech which is provided by a dialogical situation, the writer must formulate the situation in their imagination, formulate the thought in words, also without speaking, and then identify the silent words one at a time and spell them out. By attending to words and word meanings in this way, a child learns to develop conscious awareness of concepts. Learning a foreign language, under conditions when the person already has a developed system of meanings in their native language, but is obliged to make these meanings conscious for the purpose of learning how to express them in another language, is also a route to the acquisition of conscious awareness of concepts. A child raised in a multilingual home where there is an opportunity to learn two or more languages spontaneously, without effort, does not automatically receive this benefit. They are in a particularly good position to study language and develop conscious awareness of their concepts, but this does not flow automatically from being raised as a polyglot.

Instruction in a foreign language, learning to write and the study of one's own language all work together, interacting to foster conscious awareness (LSVCW v.1, p. 179). The development of conscious awareness of the concepts of everyday life in this way, interacts with instruction in true concepts, fostering the development of a more concrete understanding of scientific concepts.

Definitions

Vygotsky discussed the child's ability to give definitions of words signifying concepts with which the child was already familiar. As mentioned at the beginning of the previous chapter, the method of investigating concepts by means of asking the subject to

give a definition of a concept sheds a problematic light on the subject's thinking. It tests the level of the subject's *verbal* development and/or their formal education. Giving definitions is an abstract task in which the concept is torn from its natural connections, a task which hinges entirely on the use of words. Particularly for the child, however, the concept is linked with practical-sensuous material, and children generally take as the definition of something what it does or what can be done with it. Such functional meanings are the foundation of potential concepts.

For true concepts, on the other hand, the concept is essentially divorced from sensuous material. But an adolescent who uses a word as a true concept, when asked to define it, is apt (like cognitive psychologists) to define it as a complex (LSVCW v.1, p. 161). In general, when asked to define a concept which they use correctly, a person sinks to a more primitive level than they exhibit in the practical use of a concept in its natural setting. At *any* stage of development, a definition is always narrower in scope than the concept itself. Vygotsky saw the definition of a concept as a demonstration of what he called the 'law of concept equivalence'. That is, that a concept (as opposed to a complex) can be expressed in an infinite number of ways in terms of other concepts connected with it (LSVCW v.1, p. 158). For example, the number 1 is also the difference between consecutive numbers or the ratio of a number with itself, as well as the first natural number, and so on (LSVCW v.1, p. 227).[*] To give a definition is to give verbal expression to the connection of a concept with other concepts, as part of a whole system of concepts. Any single definition therefore simultaneously narrows the concept, whilst at the same time, expressing its connection with a larger system of concepts.

> *Only within a system can the concept acquire conscious awareness and a voluntary nature. Conscious awareness and the presence of a system are synonyms when we are speaking of concepts, just as spontaneity, lack of conscious awareness, and the absence of a system are three different words for designating the nature of the child's concept* (italics in original, LSVCW v.1, p. 191).

Concepts are Part of a System

Another important characteristic of true concepts of all kinds is that they are part of a *system of concepts*. The only systematicity found in spontaneous concepts, is that which is inherent in the child's immediate system of support and practical actions. But this systematicity is merely implicit in the culturally and historically determined form of life, and is *external* to the concept.

> The development of scientific concepts *begins with the verbal definition.* As part of an organized system, this verbal definition descends to the concrete; it descends to the phenomena which the concept represents. In contrast, the everyday concept tends to develop outside any definite system; it tends to move upwards toward abstraction and generalization (LSVCW, v.1, p. 168).

The primary means of connection of a concept into a system of concepts is relations of *generality*. For example, the true concept of 'rose' is connected to the true concept of 'flower' by the fact that a rose is a flower, and to 'camellia' by the fact that a camellia is also a flower. This relation is made possible by the fact that 'flower' is a generalisation of the various kinds of flower, and the concept of 'rose' includes within it this relation to its genera. To be clear, there is no suggestion here that a category such as 'flower'

[*] The concepts of a system of scientific concepts have a hierarchy, so that not every relation between concepts may function as a definition in the narrow sense. Definition is a special case of the connection between concepts.

denotes the presence of any kind of common attribute of the members of the category. Carburettor and fan belt are both automotive components, but have no particular attribute in common. Bicycle and toboggan are both vehicles, but also have little in common. Moriarty and the butler are both suspects, but have nothing in common.

This systematicity of true concepts follows from the fact that true concepts arise from problem/solution relations, which can only arise within some definite system of social practice and can only arise in the course of deliberate problem-solving activity. *There can be no contradictions without a system* and no problem other than within some system of practice or institution. Therefore, since true concepts arise and are sustained within some given project, institution or system of social practice, they constitute a system with some kind of logic.

Consequently, thinking in true concepts implies sensitivity to contradiction. Although it is not the case that logical thinking is only possible with true concepts, complexive thinking is tolerant of contradiction. Certain limited kinds of logical thinking are perfectly possible with pseudoconcepts, and pre-concepts are certainly amenable to rational problem-solving. But in general, pseudo-conceptual thought does not recognise contradiction, because every concept is a concrete thought form which is related to *its object*, not to other concepts. Conversely, true concepts are in the first place related to *other concepts*, and only mediately to the concrete object, event or situation which is their object.

For thinking in complexes, ‘rose’ sits side by side with ‘flower’, and the statement that “A rose is a flower” is like “$x = 7$” for someone who does not know algebra. Each is a pseudoconcept and is determined by a concrete image of the objects it designates in adult speech. There is no relation between ‘rose’ and ‘flower’ other than the logic of practical intelligence. Once concepts take on the significance of points or orders in a constellation of organisms either in a Linnaean or a Darwinian taxonomy, then the relation of the person to the concept and the object is changed. Now the person confronts a whole system of concepts of natural objects, and he or she must learn how to place an organism’s concept within this constellation. The concept-system has intervened between the subject and object, and with it, it has brought meaning, system and the potential for reasoning and therefore contradiction.

A scientific system of nature arises for the child only thanks to instruction, be that at home or at school. More limited systemic concepts can arise where the child’s own field of activity presents an element of systematicity. For example, if a child is raised in a home where he has the opportunity to disassemble and reassemble automobiles, or build model aeroplanes, it follows that potential concepts can be formed which contain already the rudiments of system. Even a spoon contains implicitly the entire culture of eating at an appointed time, at a table with cutlery. One good reason that Vygotsky chose scientific concepts as the paradigm of the true concept, is that scientific concepts, especially the concepts of social science, cannot arise spontaneously from the normal conditions of a child’s life, and are thus truly nonspontaneous.

Conscious awareness presupposes being able to define a concept in terms of other concepts, and therefore the existence of a *system of concepts*. The ability to reason logically with concepts arises from the fact that all systems of concepts have arisen from traditions of practice concerned with the solution of some class of real problem. The relation between a carburettor and a fan belt is, in the first place, the logic of the interaction between the various components in an automobile. Behind that ‘embodied

logic', the relation between the various concepts representing automotive parts, is the problem-solving work of automotive engineers down the decades, how overheating was solved, how air was blended with fuel, and so on. In learning, not only to identify these objects by their sensuous attributes, but in learning about them, as parts of a system, the child enters into the whole world of automotive engineering. *Mutatis mutandi*, the same would go for a child raised within a hunter-gatherer community. Likewise, it is one thing to identify organisms by their sensuously given features, but *science is quite another thing*. A scientific classification presupposes entering into the problems which have confronted naturalists down the years, and how this or that feature came to be used to differentiate a species or order of organism in order to overcome some definite problem. So again, by acquiring true concepts, an adolescent does not enter into Set Theory but rather learns the logic of practice, at least insofar as it is reflected in the profession or school subjects that he or she is instructed in.

> the motive force that determines the beginning of this process and sets in action the maturational mechanism of behavior impelling it forward along the path of further development is located not inside but outside the adolescent. The tasks that are posed for the maturing adolescent by the social environment – tasks that are associated with his entry into the cultural, professional, and social life of the adult world – are an essential functional factor in the formation of concepts. Repeatedly, this factor points to the mutually conditioned nature, the organic integration, and the internal unity of content and form in the development of thinking (LSVCW v.1, p. 132).

Generalisation

> At any stage of its development, the concept is an *act of generalization.* The most important finding of all research in this field is that the concept – represented psychologically as word meaning – develops. The essence of the development of the concept lies in the transition from one structure of generalization to another. Any word meaning, at any age, is a generalization. However, word meaning develops. When the child first learns a new word, the development of its meaning is not completed but has only begun. From the outset, the word is a generalization of the most elementary type. In accordance with the degree of his development, the child moves from elementary generalizations to higher forms of generalization. This process is completed with the formation of true concepts (LSVCW v.1, p. 169-70).

This paragraph sums up much of what Vygotsky has to tell us about concepts: concepts are activities, not the passive result of exposure to sensuous stimuli. Words are indispensable tools of generalisation and the psychological form of generalisation is word meaning, which is itself an action, not simply a property of the word. Concepts, and therefore word meaning, are always developing, moving through various forms of generalisation.

In childhood, development primarily takes the form of mastering more and more developed forms of generalisation, as outlined in the previous chapter. However, the conventional generality of a concept does not necessarily correspond to the level of generality at which it is being used. This is exhibited in the way a child uses 'rose' and 'flower' at the same level of generality, even though the properties of the individual objects named would demonstrate that 'rose' is a subset of 'flower', this is not reflected in an appropriate relation between the concepts.

During childhood, a number of factors guide the direction of acts of generalisation. First and foremost among these is the use of words by adults in collaboration with the child, so that the child uses words to pick out objects so as to match the adults' word-use. But,

nonetheless, the child only develops their word meaning in the course of solving problems which arise within their social situation, not by simply memorising what they are told. This line of development culminates in pseudoconcepts, which resemble in structure the abstract general concepts known to cognitive psychology, in that they indicate a collection of concrete objects. Complexes, as they first appear in the child's actions, do not necessarily represent the abstraction of attributes common to the objects indicated, since the ability to isolate attributes and generalise according to these attributes, develops only gradually. By the time a child has perfected their ability to abstract and isolate the attributes of objects, they are ready to form pre-concepts, by transforming these abstractions into simple concepts. But this comes after, not before, the formation of pseudoconcepts.

The other source of concepts is the child's practical intelligence which predates the child's first words but is developed through the use of words, which create the possibility of meaningful perception and meaningful actions. The child's interaction with the material world around them allows them to form potential concepts, which are spontaneous concepts reflecting their own practical activity and interaction with the world around them. Potential concepts are a limited source of generalisation according to the richness of the experience open to the child.

The kind of generalisation which is afforded by true concepts is of a different order, in that it is not possible for the child to make this kind of generalisation from their own sensuous or practical interaction with objects. Instruction and collaboration with a teacher or other aficionado is essential. Here generalisation does not arise as a result of development of the concept, but is there *from the beginning*: generalisation precedes concrete perception. The true concept represents the distilled wisdom of the past and comes to the learner via the word, as a form of generalisation, which the child is able only later to connect to the concrete objects and situations it has as its object.

Instruction must take different forms according to the type of generalisation and word meaning the child needs to acquire. A child cannot be taught about a pharaoh or Avogadro's Number by the same methods as they are taught to recognise a rose or a camellia. The kind of generalisation required has always to be kept in mind.

But the most important thing to remember about generalisation, a point which Vygotsky makes time and again, is that every generalisation makes a concept richer, not poorer.

> In contrast to what is taught by formal logic, the essence of the concept or generalization lies not in the impoverishment but in the enrichment of the reality that it represents, in the enrichment of what is given in immediate sensual perception and contemplation. However, this enrichment of the immediate perception of reality by generalization can only occur if complex connections, dependencies, and relationships are established between the objects that are represented in concepts and the rest of reality. By its very nature, each concept presupposes the presence of a certain system of concepts. Outside such a system, it cannot exist (LSVCW v.1, p. 224).

Conclusion

Vygotsky has approached an understanding of concepts by tracing their development, mainly in ontogeny. What makes his finding complex, is that there are several intertwining lines of development and several ideal types of concept, and every real, mature concept realises traces of each of these lines of development and the ideal types corresponding to them. Through his observation of children and his experimental work, Vygotsky has given us the processes of development of each component of conceptual

activity. What we have as a result is not just a range of different theories about the nature of concepts, or conflicting hypotheses, or an empirical mixture of various kinds of behaviour: we have an understanding of the complex structure of a concept, whose separate roots can be traced and understood.

Although the pseudoconcept is the characteristic product of childhood, more generally it is the kind of concept we have of something when we have neither practical experience with something nor any knowledge of it as part of a system of concepts. So pseudoconcepts are with us for life. Further, so long as we have only an abstract concept of an object, acquired through instruction, and defined in terms of its connection with other concepts, we remain in a position where we would not recognise the object if we bumped into it in the street. Only thanks to merging with our spontaneously developed, pseudoconceptual thinking can we learn to recognise the object and begin to merge our abstract ideological knowledge of an object with concrete experience of it.

Likewise, our first experience with system is through our practical interaction with the objects we meet in our everyday life, in which systematic relations are *built into* the objects themselves, and these objects are grasped with what Vygotsky calls potential concepts. They are 'potential' because like true concepts they are part of a system, but rather than the system of social life and institutions of the wider human society, it is the system of their own immediate practical activity. And potential concepts are spontaneous, and not used with conscious awareness.

Both pseudoconcepts and potential concepts are forms of activity which not only the higher animals but even machines can attain. Pseudoconcepts and potential concepts are acquired by habit, spontaneously and without conscious awareness, but true concepts can only be acquired with conscious effort and awareness. This is true because true concepts are part of a system of concepts, which stands between the subject and object, and in principle are independent of the sensuously given properties of the object which is given to the subject.

One of the greatest barriers to a scientific understanding of concepts in psychology is the fixed belief that a true concept is something like a Set and that formal logic specifies exhaustively the only rules for handling concepts. In Vygotsky's words:

> [T]raditional psychology acted like a slave in following the description of the process of concept formation assumed by formal logic, ... In the traditional view, the concept is the aggregate of these common features, features isolated from a series of similar objects.
>
> It is difficult to imagine a more distorted representation of the actual course of concept development. Psychologists have long noted that *the formation of the adolescent's concepts never takes the logical path depicted by this traditional scheme* and our experiments clearly support this position (LSVCW v.1, p. 162).

Dialectical logic is nothing more or less than the art of handling concepts, real concepts as opposed to impoverished, pseudo-concepts. This prejudice which also makes analytical science the slave to formal logic acts as a barrier to the development of all science, which is after all about nothing other than concepts. If the nature of concepts can be clarified by studying their nature directly, in the psychology of concepts, then maybe something can be done for the development of science as a whole?

One final step to understanding Vygotsky's theory of concept remains. The whole process of development of concepts hinges around words and word meanings and the use of words in the general community, and true to his commitment to the genetic

method, Vygotsky has traced this whole process of development through word meaning. But:

> As the relationships of generality change with each new structure of generalization in the process of development, they elicit changes in all the operations of thinking accessible to the child. In particular, the long established independence of the word from the remembered thought increases with the development of relationships of generality and concept equivalence.
>
> The young child is completely reliant on the literal expression of the meaning that he learns. To a great extent, the school child already reproduces complex meaningful content independently of the particular verbal expression where he learned it. As relationships of generality develop, there is an increase in the concept's independence from the word. Meaning becomes increasingly independent of the form in which it is expressed. In general terms, there is an increasing freedom of the operations of meaning from their verbal expression (LSVCW v.1, p. 228).

In the next and final chapter of "Thinking and Speech" Vygotsky makes clear that verbal thinking is not the terminus of the intellect, but:

> Thought is not only mediated externally by signs. It is mediated internally by meanings. The crux of the matter is that the immediate communication of consciousness is impossible not only physically but psychologically. The communication of consciousness can be accomplished only indirectly, through a mediated path. This path consists in the internal mediation of thought first by meanings and then by words. Therefore, thought is never the direct equivalent of word meanings. Meaning mediates thought in its path to verbal expression. The path from thought to word is indirect and internally mediated.
>
> We must now take the final step in the analysis of the internal plane of verbal thinking. Thought is not the last of these planes. It is not born of other thoughts. Thought has its origins in the motivating sphere of consciousness, a sphere that includes our inclinations and needs, our interests and impulses, and our affect and emotion. The affective and volitional tendency stands behind thought (LSVCW v.1, p. 282).

Vygotsky traced external speech on its journey inwards through egocentric speech to inner speech to thought, to reveal the structure of verbal thinking. At the same time, he found the source of concepts *outside* the child, in its collaboration with adults and in the community at large. Actual thought then is on an even deeper plane, but his analysis also points to the source of concepts in the wider domain of social life, which also provides the person's motivations.

In the next chapter I will very briefly present what we have learnt from Vygotsky about this question. In part the importance of this is the widely held view that Vygotsky never tackled this question at all, that this problem was addressed for the first time only by AN Leontyev and his Activity Theory.