

On the Definition of Learning

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How we learn

A critical-constructive discussion of Piaget's and Vygotsky's theories of teaching and learning and their reactions to each other

Steen Beck

Introduction

The concept of learning plays an important role in contemporary considerations about education. Almost all leading learning theories today are based on the view that learning in school demands students with the ability to relate actively to the academic subject and through dialogue, experiment, reflection etc. thereby creating a personal academic identity. This point of view is called *constructivist* and the Swiss biologist and epistemologist Jean Piaget (1886-1980) is an important figure in the classical constructive idea of learning as a subjective and cognitive construction. According to Piaget learning is closely connected to possibilities and limits of the individual cognitive capacity and development. While Piaget emphasized the mechanism of individual auto-regulation without leaving social factors out of account in the formation of rationality, other psychologists have paid much more close attention to social situated learning and the mechanisms involved in learner's appropriation of cultural knowledge which in fact is what academic subjects can be said to be. This point of view can be called socio-cultural and Lev Vygotsky (1896-1934) is a central figure in this approach. While Piaget studied the individual construction of knowledge 'from within' through assimilation and accommodation, Vygotsky showed how instruction 'from without' creates a *zone of proximate development* whereby an important link between individual learning and cultural appropriation is created.

From my point of view the difference between Piaget's and Vygotsky's approach should not be exaggerated (for a more detailed unfolding of my analysis in this chapter, see Beck 2015). They both stressed interaction as fundamental to development and learning, and there are many similarities in their approach to changes in cognitive

structures and their ideas of how concepts are created in the individual's developmental process. But also the two theorists conceptualized the relation between the individual and its social environment with different foci and ideas of the importance of 'the social'. The difference does not only concern the difference between Piaget's biological and Vygotsky's socio-cultural approach (although this difference – as we shall see – should not be exaggerated), but also the relation between (teacher) control and (student) freedom: Piaget stressed with his foundation in protestant individualism the autonomy of the individual towards the societal authorities, while Vygotsky with his foundation in Marxism and revolutionary ideas of 'the new socialist man' stressed the importance of social technologies in the transformation of human cognition.

In this chapter my thesis is that Piaget's and Vygotsky's cultural contexts and philosophical and scientific orientations for sure created some important differences in their approach. At the same time I argue that they both contributed with important perspectives on the relation between teaching and learning. Therefore the differences between their approaches should not be discussed in a manner where *the winner takes it all*, but with respect to the complexity of development as a process where biological, psychological and cultural levels are all involved.

It is in the light of such efforts to reopen the debate on the relation between teaching and learning that I want to revisit the two great theorists of learning with a deconstructive as well as a constructive purpose in mind. My *deconstructive purpose* is to show that neither Piaget's idea of psycho-genesis nor Vygotsky's idea of socio-genesis is sufficient to explain what learning is while my *constructive purpose* is to show that both of their contributions to learning theory are necessary even though what they add up together does not suffice. The chapter is structured as follows: In the first two sections, Vygotsky's and Piaget's respective theories of concept formation and the relation between learning and teaching are introduced in a historical context which seems important if the meaning of their theories are to be fully understood. Also their critique of one another is introduced: My intention is here to locate what Vygotsky and Piaget pay attention to regarding each other's position and what they ignore. In section three, I discuss some strengths and weaknesses of their positions and of their reactions to each other. In section four, some fundamental differences

between the two theoretical giants' approaches to teaching and learning are discussed, and, in section five, I attempt to integrate the viable parts of Piaget and Vygotsky's theories, thereby revitalizing and actualizing central insights from both.

Vygotsky's theory of instruction – and his critique of Piaget

Vygotsky's theory of learning

Vygotsky created his world famous theory about children's cognitive development and the importance of instruction-based learning only a few years after the Russian Revolution in 1917. He wanted to contribute to Lenin's and the Bolsheviks' ideas about the new socialist man and from the beginning of the 1920s he considered education a vital part of this project (Au 2007). An educated population was necessary in order to modernize Russia – but how should teaching and learning be understood and practiced from a Marxist point of view? With Marx, Hegel, Spinoza, the Russian behaviorists and linguistics such as Potebnya and Shpet as his starting point, Vygotsky developed a view of man as an individual who learns to master his own nature. This theory was founded on extreme rationalism and adopted the utopian point of view that the individual within the realized communist society becomes transparent to himself (Vygotsky 1997/1927; 1994/1930).

Vygotsky was a child of the *historicism* of Dialectical and Historical Materialism in which “laws” of history are revealed and higher as well as lower forms of civilization and consciousness are analyzed (Popper 1962; Gielen and Jeshmaridian 1999). Man had developed his thinking historically and in the future it would be possible to develop it even further, thereby creating a humanity of social individuals whose levels of cognitive and emotional self-mastery were so high that they would in reality constitute a new kind of human beings. To Vygotsky, education was crucial for this development to take place (Vygotsky 1926/1997; 1934/1987). With his sense of dialectic thinking and his interest in the interplay between different factors that come together as a totality or, as Vygotsky termed it, a “unit of analysis” or a “cell”, he definitively transgressed a more primitive form of materialism by showing that phenomena cannot be understood simply by reducing them to “the material”, e.g. the brain, but that it is the interplay and the productive contrasts between phenomena, e.g. between thought

and language, between lower and higher mental processes etc., that generates development and thereby renders possible the emergence of qualitatively new aspects.

From Vygotsky's point of view, higher mental functions include language, which at first exists *outside* the individual as an inter-mental phenomenon, but it soon becomes an intra-mental tool for reflection and self-reflection, thereby becoming the base for the production of meaning. This is in brief terms the developing line of the individual, moving from the imitation of words heard from others, to the expression of scientific concepts used in problem solving. In this way, the individual is closely linked to the development of society and of the species, but in a dialectical manner wherein the relation produces affirmation and negation, a process which explains the emergence of new cognitive abilities.

According to Vygotsky, the function of language changes during a child's development. In early childhood, language is used for emotional expression and social interaction. Later, it is used for communication and intellectual purposes. Although biological considerations are not at the forefront of Vygotsky's thinking, he is aware that biological maturation is involved in concept-development. He talks about neo-formations and 'crises' in the development of the child (Vygotsky 1932), and he defines the child's first efforts to create concepts or concept-like words as *syncretism*. During this phase, the child tries to create abstractions in a chaotic and unsystematic way. In the next phase, the child creates *complexes*; now concepts are established, but they are closely related to everyday experiences and without any system. After a period wherein the child creates what Vygotsky calls *pseudo-concepts* and *potential concepts*, which hold traceable elements of systematic thinking, but still no ability to reflect on his own use of concepts, the child is ready to form real or *scientific concepts*. Unlike everyday concepts, scientific concepts are formed as part of the instructional process and do not belong to the child's own "empirical" register, but to the collective thinking of mankind.

From here, the route to Vygotsky's famous concept of *the Zone of Proximal Development* ran very straight: To learn is to acquire skills that were at first outside of the learner, held by more able learners and were then internalized. In this way, rudimentary functions are used to develop proper skills. What the child is able to do in collaboration today he will

be able to do independently tomorrow (Vygotsky 1984/1934, p. 211). Children with the same biological age have different mental ages and accordingly different potentials. According to Vygotsky, it is not possible to say anything of significance about an individual's intelligence from a given test, because you have to consider that individual's potential for learning as part of the IQ: The child who profits the most from the help of another has the greater intellectual potential.

Vygotsky's critique of Piaget

In Vygotsky's *Thinking and Speech*, Piaget takes a prominent place as both a celebrated and a criticized figure. Vygotsky agrees with Piaget that a child's ability to use scientific concepts is dependent on development and must be interpreted as an emergent phenomenon. Concepts cannot, in Vygotsky's own words, be compared to hot cakes being served to the child (ibid. p. 179), but become possible in a developmental perspective where the active child "does" something and thereby changes himself. At the same time, however, Vygotsky is not satisfied with Piaget's understanding of the dialectical relation between the child's contribution to concept development and the importance of the cultural context. Piaget promotes the idea that the only authentic thinking performed by the child is spontaneous and self-constructed, while instruction-based thinking is more superficial and, in fact, alien to the child because it is not in accordance with the child's own logic. In Vygotsky's interpretation, Piaget's point of view is that scientific concepts are forced upon the child from the outside; they are alien to the child itself (ibid. p. 175). Vygotsky's conclusion is that, to Piaget, the child's characteristic way of thinking has no constructive, positive and formative function in the child's mental development and growth (ibid. p. 175). Vygotsky holds the opposite to be true: There is no antagonism between spontaneous and non-spontaneous concepts. As the child develops, its use of language is re-structured, hence making it possible to develop a capacity for higher mental functions through the appropriation of the cultural tools, which in turn become the foundations of conscious attention, verbal memory, systematic thinking etc.:

"Finally (in opposition to Piaget's mistaken and contradictory third position), we would argue that – in the process of concept formation – the

relationship between the processes of instruction and development must be immeasurably more complex and positive in nature than the simple antagonism proposed by Piaget” (ibid. p. 177).

It is Piaget’s psychoanalytically influenced interpretation of egocentric mentality that prevents him from obtaining a genuine understanding of the child’s concept-formation. Vygotsky notices that, from Piaget’s point of view, the egocentric thought must be destroyed before anything new can enter and Piaget’s point of view seems to be that the destruction of egocentrism is realized through an intervention from without. Scientific concepts, however, are not created from without, but rather by an extraordinary effort of the child and his readiness for comprehending them as a result of his development of conceptual capacity. This is the reason why non-spontaneous concepts are in no way contrary to spontaneous concepts or, as Vygotsky terms them, everyday concepts. He speaks of a fluid limit or a complex process wherein the two concepts influence one another. The development of non-spontaneous concepts influences everyday concepts – and the two kinds interact in a continuous process (ibid. p. 178).

Vygotsky’s analysis of the child’s emerging realism and its development towards conscious self-mastering as well as his critique of Piaget’s theory of the egocentric nature of the child’s mentality are important premises for his approach to the learning of school subjects. Children learn to use scientific concepts when they are introduced to these in a systematic and well-defined form, and by using and discussing them in ways that accord with their actual cognitive abilities and in respect of concepts containing challenges realized in the zone of proximal development where the less able learn from the more able.

Vygotsky’s critique of Piaget is absolute and leaves no room for compromise. However, the question is whether he actually interpreted Piaget’s position correctly. I will return to this question after introducing Piaget and his response to Vygotsky.

Piaget’s theory of learning – and his response to Vygotsky

Piaget’s theory of learning

A good starting point for an understanding of Piaget’s approach to development and learning is the spiritual crisis he experienced in his

early years (Ducret 1984; Vidal 1994). This crisis was taking place in the Protestant environment of his childhood, in the wake of the successes obtained by the natural sciences, but also on a personal level in the form of a young man's effort to reconcile science with faith, knowledge and ethics. By taking up ideas from Henri Bergson and Auguste Sabatier, he developed a set of ideas about the relationship between consciousness and evolution. These considerations can be found in his early works *Le mission de l'idée* (Piaget 1916) and *Recherche* (Piaget 1918) wherein he took the first steps towards a biological theory of life as a process of becoming and of equilibrium processes. Although Bergson was replaced by other sources of inspiration and discourses, the ideas about *duration (la durée)* and *the vital impulse* became lasting platform to Piaget (Bennour & Vonèche 2009).

Piaget viewed the particular mode of thought held by the child as qualitatively distinct from that of the adult. His point which was – as Vygotsky rightly emphasizes – clearly inspired by psychoanalysis (Piaget 1920 a+b) was that the child develops from having a non-socialized, autistic and ego-centric mentality towards a more socialized and decentralized mode of thought, which is logical and rational. Here we find important brick stones for his famous theory about the four developmental stages caused by assimilatory and accommodative processes involving both internal regulation and experiences of the exterior world, such as objects and people (Piaget 1936/1948; 1937; 1945/1994; 1970/1979).

Piaget's view of Protestantism and his defense of immanence, which values the human desire for balance as well as the unification of the particular and the general, were decisive to his understanding of human development and moral judgment. This allowed him to defend the individual right to develop an autonomous morality founded on reason rather than a heteronomous morality founded on tradition and superstition (Piaget 1928; 1930/1998; 1932; Piaget & Inhelder 1955/1970). In extension of this idea about the formation of an autonomous morality and mode of thought, he argued for a new kind of school based on a new pedagogy: *l'école active*. Here, the learning processes made it possible for a child to develop an autonomous morality by means of interacting and collaborating with other children.

Piaget's theory of learning was founded on the close connection between biological and cognitive processes (Piaget 1970). Starting out from the theory of the human being as a living organism, he formed

a theory about its basic mental processes. He emphasized the self-regulative character of the psychological system (Piaget 1968) while regarding cognitive development as the result of interaction between the individual and its surroundings. Although Piaget stressed the individual character of learning, he did not – as is often postulated by social-constructivists – ignore the importance of interaction with the exterior environment. We develop and learn by acting upon objects and we learn to correct our “egocentric” thoughts through cooperation with others: Operations and co-operations refer to the same fundamental cognitive processes (Piaget 1965/1977). Also he was aware that different cultural environments create different possibilities for cognitive development and learning (he even mentioned “lazy” cultures as a threat to individual development) although he at the same time stated that we have to consider universal aspects of development and learning; he talked about possible delays in cognitive development due to under-stimulation from the environment and also he discussed if abstract thinking is developed in ‘primitive’ societies in the same degree as in modern societies (Piaget 1966).

According to Piaget, humans have the ability to maintain knowledge and experiences in relatively stable ways, which he calls “schemes”. Learners improve their schemes because they need to adapt to the environment with its tasks to be solved and skills to be learned. In functional terms, the adaptation process is identical with a continuous effort to attain equilibrium by assimilation (whereby we translate new experiences to already existing meanings) and accommodation (whereby we adjust our schemes according to new experiences). Piaget’s basic idea is that human beings are problem-solving creatures trying to re-establish an interrupted balance between part and totality and between the interior self-regulations and the exterior environment. This is Piaget’s theory of learning in a nutshell: Learning takes place when the individual knows that there is something he wants to know or do, which he or she is currently not capable of knowing or doing. The recognition that one is not able to solve the problem, but has to learn something new sets in motion a learning process whereby the individual changes his capacity for learning while also learning something specific. In other words, Piaget’s epistemic subject is driven towards “the new” by its need for a new balance, which in turn catalyzes the emergence of new cognitive capacities.

The neo-Piagetian scientist Juan Pascual-Leone (2012) refers to Piaget as a “dialectic constructivist” and emphasises the fact that, in terms of an actual understanding of Piaget’s theories of the processual nature of thinking, the issue is not one of structures, but rather of *structurations* and *de-structurations*: Piaget operates with affirming and negating cognitive processes; the affirming processes, relating to assimilative thinking, are linked to the schemes and enable the individual to act in accordance with intentions and understandings. Accommodative processes, however, create negations in relation to the existing schemes of understanding; they are incongruent, dialectically anti-polar and create the basis for new forms of *practice* (for a comparison of the dialectical thinking of Piaget and Hegel, see Kesselring 1981).

Piaget was first and foremost interested in the cognitive development of human beings and in kinds of thinking made possible through spontaneous practice and not through cultural forming, such as via school education. On the other hand, this does not mean that his research was without pedagogical implications. According to Piaget, traditional teaching created overly passive learners left without the possibility of making the necessary operations, such as analysis, experiment, suggestions, communication etc. The exterior world certainly is influential, but not in any direct way. Its importance consists mainly in stimulating operations and actions.

Piaget’s answer to Vygotsky

In 1962, Vygotsky’s main text, which included his critique of Piaget, was translated into English with the title *Thought and Language*. Piaget was asked to respond to Vygotsky in an afterword and, although he had heard of Vygotsky from Russian colleagues such as Luria and Leontjev, this English translation was his first opportunity to become acquainted with Vygotsky’s critique, by then almost thirty years old. Piaget’s task was not easy; in 1962, he was to give a response to a long-dead colleague, who in 1934 had reacted to Piaget’s first texts from 1923-24.

In his commentary, Piaget does not find the difference between his own and Vygotsky’s approaches to children’s concept development as fundamental as Vygotsky does. Moreover, he finds Vygotsky’s criticism of the fact that he ignores the importance of scientific concepts in cognitive development misunderstood. Piaget’s point of view is that this is exactly what his genetic theory is about:

"Vygotsky concluded from his reflections on my earliest books no doubt without suspecting that this was exactly my research-program [...], namely that the essential task of child psychology was to study the psychological formation of scientific concepts by following in sequence the process 'before our eyes'" (Piaget 1962, p. 250).

In the same paragraph, he says that he later – which Vygotsky could not know – published studies of children's understanding of basic scientific concepts, namely the development of children's understanding of numbers, quantity, movement, time, space, etc. Vygotsky accuses him of ignoring scientific thinking, which is nothing less than the hard core of his research program on how scientific thinking is possible for human beings. From his point of view, the development of spontaneous concepts leads to fundamental logical-mathematical structures, which are the preconditions for scientific thinking and the "taking in" of school subjects.

Piaget also finds Vygotsky's critique of his approach to teaching and learning unsatisfactory. Once again, it is the question of how to understand the development of concepts that puts Vygotsky on the wrong track. Piaget emphasizes that he actually links spontaneous concepts to learning in school and he also emphasizes that there ought to be some connection between teaching and learning. Teachers should stimulate children's thinking by giving them exercises and discussing the subjects with the children. School education is, he thought, very important to children's cognitive development and can to a certain degree even accelerate cognitive processes (although Piaget was in other comments rather critical towards what he called "the American question" as he thought that cognitive development takes time and should not be pushed which is the problem with traditional 'adult-centered' school teaching). According to Piaget, it is important to stress the phrase 'to a certain degree' and by investigating other causal mechanisms than Vygotsky did, he wanted to understand the coupling mechanisms that influence the relationship between teaching and learning.

Piaget's position towards the existing teaching in contemporary schools can best be summed up as a critique of an ideology founded on authoritarian beliefs and "heterogeneous" morals, forced upon the individual from without. In the existing school, teachers generally lack an understanding of the psychological preconditions of learning. This

is the reason why teachers are not able to use children's spontaneous thinking and can at best enhance reproductive and figurative thinking. Piaget's main point of view is that children from about the age of seven are cognitively able to learn in an experimental and analytical way; therefore the teacher's understanding of age-relevant adaptation strategies is highly important if he is to relate didactical aims to real learning. In some respects, this sounds very much like Vygotsky's theory of learning in the Zone of Proximal Development; the teacher has to know the actual level of a student in order to come up with exercises that match the student and thereby enhance learning. This proximity of Piaget's and Vygotsky's positions towards pedagogy is probably the reason why Piaget finds it a little odd that Vygotsky is so eager to emphasize the differences between their approaches to the relation between learning and teaching. It also explains why Piaget finds that Vygotsky misunderstands him in a very fundamental way, namely in taking his opinion to be that teachers should teach the students spontaneous concepts in order to be able to fight against them. In fact, Piaget's point is the exact opposite, namely that teachers should use children's spontaneous intellectual development much better than they often do and in order to create much better connections between scientific concepts (school subjects) and the child's actual abilities to perform rational mental operations (the student's cognitive development).

Piaget's point is not that students are not able to learn non-spontaneous concepts, but rather that the relation between spontaneous and non-spontaneous concepts is far more complex than Vygotsky with his somewhat rough understanding of the student's actual level of learning (one of the two poles in his concept of the zone of proximal development) postulates (Piaget 1962, p. 252).

Piaget agrees with Vygotsky that two lines of thinking meet in effective learning at school, namely non-spontaneous concepts being introduced by the teacher and spontaneous concepts founded in the operational capacity of the child. Spontaneous concepts are quite different from what Vygotsky calls every day concepts. It is not possible to learn anything that is not grounded in assimilation processes and, likewise, accommodation without an assimilative platform is not possible. This is what teachers in the existing school often forget. In other words, the school should recognize the assimilation structures

of students and not push forward knowledge that is not the result of experimental learning. From Piaget's point of view, the discrepancy between himself and Vygotsky does not concern "development before learning" or "learning before development" in any simple way because he also thinks that learning enhances development by simulating new cognitive structures. More accurately, he is not satisfied with teaching that does not stimulate curiosity and problem-based learning. His conclusion, however, is not that the teacher is without importance:

"Indeed, even from the perspective of the general coordination of actions (either as overt behavior or interiorized as operations), the adult, being more advanced than the child, can help him speed up his development during educational processes in the family or school." (ibid. p. 257).

As we can see, Piaget explicitly agrees with Vygotsky's statement that learning is important to development, a statement which corresponds to Piaget's cultural thesis about the environment's importance to especially the abstract-formal phase and his general remarks on "lazy" and "engaged" milieus (Piaget 1966). One explanation of why Piaget stresses the importance of the psycho-genetic factors, somewhat at the expense of socio-genetic factors, is that he is dissatisfied with sociological and socio-cultural explanations (Piaget's critique of Foucault is significant for his position, see *Structuralism* from 1968) that ignore the active and biological nature of learning and also confuse real learning with the fact that teaching and learning often take place in a school context. This confusion results in a rather naïve optimism, which to his mind exists in Vygotsky's idea of learning as appropriation of the existing culture (Glassman 1994, p. 205).

Discussion

There seems to be a great deal of misunderstanding in Vygotsky's critique of Piaget and even though some unclear points can be detected in Piaget's early theories. Vygotsky misunderstood him at very fundamental levels, making too much of an Hegelian antithesis out of his Swiss colleague, an attitude which unfortunately was passed on to many of his followers later in the twentieth century. Piaget never thought that society and the adult in a mono-causal way change the mentality of the child, although

both play important roles. Ironically, Vygotsky seems to criticize Piaget from a child-centered position, which is very similar to the position that gave Piaget his international fame (Miller 2011, p. 81). The main point in Piaget's genetic epistemology is that, thanks to the child's mental self-regulation in the equilibrium process, the child contributes very actively to the formation of rationality as a precondition for scientific thinking. Neither does Piaget posit that new stages destroy earlier ones. Rather, his point of view is that new stages emerge from potentialities and conflicts within earlier stages and sub-stages. This is exactly what his theory of assimilation and accommodation is about. What Piaget points to when he talks about scientific concepts being forced upon the child is not a universal antagonism between the child's way of thinking and the adult's way of thinking, but rather a certain kind of socialization and teaching whereby a particularly adult logic of scientific concepts is taught and "forced upon" the child without sensitivity towards the psychological and developmental aspects of the relation. In Piaget's (later) terminology, Vygotsky only sees his critique of a specific method of teaching, but not his promotion of the necessity for operational learning matching the child's cognitive capacity.

Another problem in Vygotsky's critique is his identification of Piaget's spontaneous thinking with non-scientific concepts, which he further identifies with everyday concepts (Vygotsky 1994/1934, p. 177). But the validity of this parallel is highly problematic. When Piaget defines spontaneous thinking, he is not referring to concepts, but to types of thinking or mental operations developed through the transformation of cognitive structures that leads to more mature conceptions of time and space such as reversibility, conservation etc. Spontaneous concepts are not, as Vygotsky seems to think, empirical concepts related to everyday life, but rather to the kind of thinking closely connected to the child's cognitive capacity. His spontaneous concepts are logical-mathematical concepts constructed by the child itself, such as conservation, classification, time, space, causality etc. These are very similar to Kantian categories of understanding (Miller 2011, p. 138) constructed through processes of self-regulation specific to the dynamic intelligence of the individual child. And, contrary to what Vygotsky thinks, Piaget talks about types of thinking wherein separate elements are integrated into a system, which becomes clear when we study Piaget's structural understanding of the mechanisms

realized in human self-regulation. From Piaget's point of view, scientific concepts understood as academically transmitted knowledge can only be approached as far as the child is able to assimilate and accommodate properly the concepts and systematic ways of understanding with which it is presented. His point is not, as Vygotsky believes, that there is a clear difference between spontaneous and scientific thinking, but rather that there is a possible and historically constituted contradiction between the ways in which science is taught by teachers and the ways in which cognition operates.

However, Piaget misunderstands Vygotsky as much as Vygotsky misunderstands him. Piaget's definition of scientific concepts is not identical to Vygotsky's definition, even though he seems to believe so (Feldman & Fowler 1997). When Vygotsky speaks of scientific concepts, he is not referring to concepts that become possible as a consequence of the child's cognitive and spontaneous development, but to concepts belonging to school subjects such as social science, physics and history.

Piaget misses Vygotsky's point about cultural knowledge as something the adults introduce to the child because he does not find "adult thinking" interesting, as it is contingent and irrelevant to the development of the child's capacity to think. As Ronald Miller has stated:

"... Piaget's spontaneous operations are not part of the cultural repertoire that is handed down across the generations but constitute part of the universal human condition that renders culture possible. In drawing the distinction between spontaneous and non-spontaneous concepts, in an important sense Piaget was limiting the scope of this theory in much the same way that he preferred to describe his work as 'genetic epistemology' rather than 'cognitive psychology'" (Miller 2011, p. 40).

It is clear that Vygotsky could not see the point in limiting the scope like this. From his point of view, cultural knowledge, including science, is not a contingent phenomenon, but rather a mediating resource, which makes it possible to understand and enhance cognitive development by teaching us to generalize, make abstractions etc. Piaget refers to a fundamental level of universal, spontaneous adaption and understanding or knowledge; his interest is rather formalistic, while Vygotsky refers to non-universal, non-spontaneous appropriation of

knowledge and understanding, which is appreciated within a specific cultural context and within specific domains.

An important difference

A major difference between Piaget and Vygotsky, which is not brought to the surface in their debate, but which can be regarded as a decisive subtext if the aim is to understand the differences between their arguments, concerns their views on the student's process of formation, i.e. the question of what sort of person and citizen is to be encouraged by the school's academic and social processes. It is evident that Piaget and Vygotsky represent two separate approaches to the school's educational and cultural aims and this difference plays a latent role in their debate, albeit without either of them apparently aware of the significance of this. As was mentioned above, Piaget combines a radical Protestant individualism with the vision of a democratic school, which turns societal differentiation into a strength and which praises the individual's autonomy as the very kernel of modern society. As I have also shown, Vygotsky combines the theory of an intellectual elite's education of the people into socialism with the vision of a polytechnic school wherein the foundations are laid for scientifically enlightened and self-transparent persons who are able to independently contribute to the development of a rational society. The contrast between Piaget's Protestant individualism and Vygotsky's Marxist historicism surfaces in their dissimilar views on which mechanism of development and learning is the most important. Piaget argues in favour of the student's immanent cognitive resources, thus locating the potential for rationality within the individual human being, while Vygotsky argues in favour of the teacher's systematic instruction, thus emphasizing the structural conditions for the emancipation of people's 'freedom'. In that sense, the distinction between Piaget's "inside-out" approach and Vygotsky's "outside-in" approach, which is commonly employed as a key to explaining the differences between them, has a certain amount of explanatory power. Piaget highlights the potential for conflict and transgression in the relation between student and teacher, while Vygotsky highlights the potential for harmonious cooperation and for shaping the student's consciousness. According to Lourenço, one can go as far as to say that the major difference between Piaget and Vygotsky

is that the former takes as his starting point the individual's autonomy, while the latter understands the individual as a heteronomous being and as such dependent on its social surroundings (Lourenço 2012).

Piaget's views on the school's task are, as mentioned, linked to a critique of the authoritarian school and the unilateral respect associated with the moral and religious notions of traditional society. His argument in relation to the child's possibilities for establishing a rationality that emerges from within is ultimately linked to his notion of a rational individual who, given the right conditions, is able to think authoritatively and voluntarily contribute to society. A good society is, in other words, a society wherein differentiation creates the conditions for development and wherein the individual stands out as a resource for the development of knowledge. There is a clear coherence between Piaget's emphasis on the learning outcome as an individual phenomenon (although learning takes place in cooperation with others) and his notion of democratic education; people learn from one another, but it is up to the autonomous subject to decide the extent to which he or she wants to subscribe to the values that others, including the teacher, promote via their communication. In the relation between student and teacher, values are exchanged and the teacher is forced to employ his own values in guiding the student. But in a modern, democratic society the teacher also has to accept that it is up to the student to evaluate the teacher's values in order to come to his own understanding and that this is an individual issue. In the words of Leslie Smith: "... it is for me to make my mind up, whether rightly or wrongly, even when you are assisting me. This is Piaget's individualism, and it is the best tradition of 'education for intellectual freedom'" (Smith 2009, p. 330). In this sense, Piaget's contribution to the discussion of the relationship between learning and teaching is not about learning of one's own accord, but about learning as part of one's interaction with others and through the intellectual and moral culture that emerges, developing one's skills and moral constitution, thereby becoming not only a culture-appropriating, but also a culture-creating individual. One might thus say that the Protestant educational ethics, elevating the individual to a moral and responsible subject with all that this entails in terms of an authority-critical potential that ultimately denies any transcendence, including its views of the 'teacher-deity', is never so far away in Piaget's argumentation that it cannot be detected – just as

it remains discernible in his debate with Vygotsky whom he criticizes for emphasizing too heavily the teacher's control techniques and too lightly the student's internal development and autonomy.

Vygotsky's position does, indeed, contain certain characteristics that point in the direction of determinism because, although he has a dynamic understanding of the developmental stages of cognition through childhood and youth, these dynamics concerns predominantly increasing degrees of appropriation and internalisation – i.e. an increasing ability to receive cultural “learning”. When Vygotsky ascribes to the teacher the function of the person who by diagnosing the students' zone of proximal development can predetermine the direction of their learning process, and when he ascribes to the scientific concepts to which the teacher introduces the students a significance that is decisive to their higher mental processes, he is really saying that the teacher is speaking from a position, which the students must attain during the course of their development. In that sense, Vygotsky's theory concerns the ways in which a society and its educators can develop control techniques, not least in continuation of the double-stimulation techniques that shape the individual.

It seems to me that exactly the issue of Piaget and Vygotsky's backgrounds within, respectively, Protestant individualism and Marxist historicism constitutes the reason why Vygotsky lets teaching and learning ‘merge’ within the instruction category in order to show how culture is internalised, while Piaget maintains the importance of distinguishing between teaching and learning so as to maintain the autonomous individual's ability to act.

Towards a synthesis

The great debates on what learning is have often focused on whether a biological or a cultural view of the phenomenon is the correct one. Cognitivists usually subscribe to the former stance while social-constructivists subscribe to the latter (Wiben Jensen 2011). Most, however, will probably agree that it is hard to imagine learning that does not link to some evolutionally developed abilities particular to the given species just like most will probably also agree that in reality it is hard to isolate theories of learning from the cultural contexts within which they exist. The processes of adaptation are mainly of a biological nature (in the

sense that what is to be understood is humankind's species-particular ability to perform specific actions), while the use of tools, including language, is primarily culturally shaped. Instead of partaking in endless and dichotomous discussions of an either-or between humans as biological or cultural beings, one could make the salomonic suggestion that learning encompasses both bio-genetic and socio-genetic aspects, which during the course of an individual's development merge in the processes of consciousness and changes of capacity that we connect to learning, and which may, as far as the individual's learning course goes, be both reproductive and transformative in relation to the cultural and social input that necessarily surround learning.

Feldman and Fowler have made a very fruitful contribution to an understanding and critique of both Piaget and Vygotsky and their misunderstandings of each other (Feldman & Fowler 1997). The two researchers present the thesis that Piaget and Vygotsky refer, in fact, to separate areas of development when they speak of cognitive development and learning (Feldman & Fowler 1997, p. 199), but neither Piaget nor Vygotsky is sufficiently aware of this, which is why to some extent they talk at cross-purposes. Piaget is interested in mechanisms of development within the field of universal development. Piaget's ambition was to get behind the relation as it unfolds between student and teacher during education in order to find the hidden mechanism within the individual, which sparks its interest in learning through cooperation with others. He found his explanation in a biological regularity, namely the process of adaptation with its assimilation and accommodation that in a sort of twin-like interplay creates equilibrium processes. According to Piaget, then, the central learning mechanism is the *mentally regulated equilibrium process*. Feldman and Fowler's point here is that Piaget pinpoints cognitive abilities that are quite essential within the universal area of development, but that Piaget also misses something. He is interested in certain universal cognitive development characteristics, but not in why people develop different skills – a factor that relates to the learning of specific skills and which must be regarded as a major issue in understanding of the learning process. Because how can it be that children in different cultures acquire such different skills if they are fundamentally guided by the same need to establish equilibrium? It must, of course, have something to do with the culturally determined contents that they learn. In other words, it is no

use to separate the person who learns from the subject that the person learns if one is to understand how human beings learn.

As we have seen, Vygotsky, too, harboured the ambition to understand a number of relations on a universal level, e.g. certain universal aspects of mental development, which he termed 'crises' and 'neo-formations' and went on to analyse in relation to the first stages of concept development as well as the development from outer to inner speech. Nonetheless, his primary research field was *the cultural development* area and the individual's ability to absorb culture-historically knowledge accumulated. Vygotsky's fundamental thesis is that the development towards higher mental functions is embedded within processes of cultural history – processes that follow the laws of historical materialism and reduce the sort of biological and universal mechanisms that Piaget focuses on to secondary phenomena. Vygotsky, then, was more interested in *differences* than in similarities between human beings cross-culturally. According to Vygotsky, the central learning mechanism within the cultural development area is the relation between the person who is learning and a more experienced person. For example, the teacher or a more skilled student who has understood and is able to employ an aspect of a subject discourse can help the student who is still wavering between everyday concepts and scientific concepts to comprehend new connections. One could call this the *theory of cultural learning through a mechanism of subject-related transfer*.

Vygotsky, however, experiences problems when it comes to explaining what it is inside of the individual that motivates him to acquire different forms of knowledge. He makes a suggestion for what happens when you learn, but *not* for what happens inside the individual who focuses her attention on another individual in order to enable herself to do something she has not hitherto been able to do. Vygotsky's approach is simply *not* precise enough to explain learning as an activity that emanates from a subject in possession of motives and interests and that cannot be reduced to internalisation or acquisition.

Two important points can be deduced from this attempt to deconstruct Piaget and Vygotsky's debate with a view to putting it together in new ways. *Firstly*, there is no reason to choose between Piaget's and Vygotsky's respective positions on development and learning; universal as well as cultural mechanisms are in play when we learn and

reducing the phenomenon to one extreme or the other is an expression of reductionism that evades the fact that both biological and cultural processes are at work when we learn (Glassman 2001; Lourenço 2012). Psychogenetic (and biogenetic) as well as socio-genetic knowledge is required in order to pinpoint what learning and development are. *Secondly*, Piaget's equilibrium mechanism may be interpreted as less universal than he thought. The equilibrium mechanism that is related to the specifically human form of adaptation to the surroundings always occurs within a specific cultural environment and is thus closely linked to the forms of leaning particular to it. This is why a 10-year old boy living in a tribal society where learning to use bow and arrow is essential learns something different from a 10-year old boy in Denmark who must learn how to read and write. This also makes it clear that the equilibrium process is in fact more area-specific and culturally shaped to a greater degree than Piaget seemed to think. On the other hand, the equilibrium process, when it is related to the development mechanism within cultural and subject-specific learning, explains something that Vygotsky finds hard to account for by means of his theory of learning within the field between current and future skills in the zone of proximal development – because Piaget's theory explains what happens to us on our inner mental stage when we learn from and with one another.

Conclusion

As shown in the above analyses, the historically a-synchronic discussion between Vygotsky and Piaget was in many respects highly problematic and filled with misunderstandings and efforts to assimilate the other's terminology to their own position instead of searching for their common dialectical point of departure. However, although neither Piaget nor Vygotsky can be seen as the winner of the debate, both contribute interesting points to the understanding of teaching and learning, and some interesting conclusions may be drawn from their difficulties in defining the relation between learning and development in the formal learning situation. Piaget and Vygotsky's respective approaches to the formation of concepts should be seen more as a question of nuances, research interests and different degrees of "optimism" on the part of teaching rather than a question of entirely different theories.

As I have shown, both Piaget and Vygotsky can be interpreted as dialectical theorists, contributing different but equally important fundamental insights into the highly complex relation between intra- and inter-mental as well as between psychogenetic and socio-genetic aspects of the learning process. Piaget's dialectic is concerned with the twin processes of assimilation and accommodation as a combined process of oppositions, dynamics and emergency resulting in constantly new transformative totalities. Also his dialectical approach to the relation between individual cognition and the reality outside of the individual (being of a social, physical and human nature) is important, although his approach to instruction and socialization is somewhat under-theorized. Vygotsky's dialectics can be found in his approach to semantic word meanings which he called "units of meaning"; he showed how the relation between word and meaning changes during the ontogenetic development of the child because of the transformation from egocentric language as a tool of communication with others to inner language as a tool of communication with oneself. Also Vygotsky's idea of learning and instruction as a unit of analysis or a totality, where everything should be understood as relational, is dialectical. Moving from model-learning to self-mastering during the course of the learning process is something that takes place within the individual (here Vygotsky seems to agree with Piaget, but he does not elaborate as much as Piaget on the self-regulative nature of the process), but it also happens when other people, for instance the teacher or more cognitively able students in the classroom, facilitate the learning of the individual by making it perform with others what it cannot yet perform alone.

I will not hesitate to express my agreement with Piaget when he suggests a radical distinction between learning and teaching, although Vygotsky's point regarding the importance of the teacher as the person, who brings the discourses of school subjects into the classroom, thereby creating possibilities for learning within the zone of proximal learning, is also valid. Still, what happens within that zone is always a question of the learner's operations, which means that the results of teaching are in fact unpredictable and the communication between teachers and students vulnerable at a very fundamental level.

The dialectics between spontaneous thinking and the appropriation of scientific thinking is not a matter of shifting from one way of thinking to another, thereby repeating the quite un-dialectical discussion about

what “came first”: development or learning. It is, rather, a matter of understanding the complex relation between the individual’s emerging inner capacities and his or her assimilation and accommodation of cultural resources in co-operation with others. When it comes to learning, this points to the conclusion that the equilibrium process (as explained by Piaget, only more closely related to a given practice and learning of a specific skill than Piaget seemed to believe) is best understood as taking place within a zone of proximal development (as explained by Vygotsky, only less influenced by the teacher than Vygotsky thought). We learn with and from others – yet we learn in individual ways; this is the precondition not only for our search for models to learn from, but also for our – hopefully well-deserved – position as models to others.

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