Piaget and Vygotsky on the child becoming sign-minded

Lenninger, Sara

Published in:
Heterogénesis: Revista de Artes Visuales

2006

Piaget and Vygotsky on the child becoming sign-minded

Sara Lenninger,
Department of semiotics,
Lund University

As the child grows up it becomes more and more a part of the adult world of communication and understanding. Semiotic studies of the development of signs in children are remarkably few, as if the mere existence of signs were taken for granted. For example, the "paths of signification" according to Greimas, illustrated by the semiotic square, do not take in to account the development of the mind. Neither is the evolutionary aspect of the sign elaborated by Groupe _ although they take perceptual and cognitive aspects into account in the construction of the sign. Nevertheless there are some very important exceptions in the literature, and in this article I will keep my focus on two of them: Piaget and Vygotsky. Their studies have had great influence in disciplines relevant to the study of semiotics such as sociology, cognitive psychology and pedagogy. The studies in the child's cognitive development conducted by Piaget and Vygotsky in the last century still have the capacity to influence theoretical claims and the designs of concrete studies (as for instance, in the work of Sonesson, Callaghan, DeLoache, Tomasello, Golomb, and von Hofsten). Krampen, in particular, discusses Piaget in connection to Peirce suggesting "developmental semiotics" as a specific approach to the study of semiotics. Other significant contributions to the enquiry into the evolution of signs have been presented by for example Sebeok (1972, 1994), Deacon (1997), Donald (1991, 1998), and Gibson (1979, 1966), but they will not be dealt with in this article.

When the theories of Piaget and Vygotsky are discussed the disunity of their theoretical implications is often in focus, such as the regression or the emergence of egocentrism and inner speech. Although Vygotsky is critical of the early works of Piaget, he is also highly influenced by it, and there are essential similarities between them. This is particularly obvious in their views on the stage-related developmental process of cognitive abilities in which thought undergoes not only quantitative but, more importantly, qualitative, changes. In this

article, I will point out some similarities and dissimilarities that elucidate interesting questions about the development of cognition and of what Piaget refers to as the semiotic function. Eventually, I will also discuss some implications of Piaget's and Vygotsky's cognitive developmental theories on clinical studies of picture comprehension in the child.

In broad outline, Piaget may be said to explore the underlying mechanisms in the individual constructing its thoughts, while Vygotsky deals with socially driven mechanisms for constructing language meaning and learning. But both of them relate mental processes to the generative constructions of systems that sustain development, i.e. in culture or in the individual interacting with its environment (cf. Wozniak 1996). To understand mental processes cognition (language and thought), Vygotsky stresses, must be studied in terms of dialectic relations between entities that form emerging wholes in mutual progressions. The structures in this process are understood when relating interfunctions of mind and the development of manifested signs in ontogeny (the development of the child) and in culture. In the framework of Piaget the system underlying cognitive progressions evolves through the relative roles of perception and actions, as well as by means of later operations, as the individual adapts to the environment. To Vygotsky as well as to Piaget the capability to share a collective system of signification provides the conclusive step towards mindfulness and directed consciousness.

Thought and language

In *Thought and language* from 1934, Vygotsky (1999) offers his crucial critique of Piaget; more importantly, however, he outlines a theory of cognitive development that includes a shift from biological to cultural development. Cognitive development in terms of a bio-cultural duality has been shown to be fruitful to research in the more recent works of for example Donald, Tomasello and Dawkins. When Vygotsky died in 1934, at the age of 38, Piaget had almost five decades more to go in the field of science. Therefore I will not restrict my discussion of Piaget to the time of Vygotsky's critique.[1]

Vygotsky stresses that studies of language are inseparable from studies of thought, but still they are not the same. The structure of language does not mirror the structure of thought (cf. Vygotsky 1999, ch.7, 406). Language and thought have different roots and originate from separate but related streams of cognitive development, streams that recurrently intervene and come apart in the emergence of mature or true concepts. Verbal thinking that comes into

[1] Piaget died in 1980

existence in words has historical and cultural sources, distinguishes itself from natural behaviour and has specific qualities and laws not detectable in natural forms of thought (cf. Vygotsky 1999, ch.4, 165). In the child, Vygotsky argues, the development of thought and of speech also moves in reverse directions. Thoughts emerge from a dimly demarcated whole and are successively made differentiated and explicit thanks to the mastering of language. Language develops from single-word-use to the constructions of composite wholes. By comparison with Piaget, Vygotsky is more occupied in examining the mechanism behind word meaning and learning but has less to say about what he refers to as natural forms of thought.

Language is to Vygotsky what made the human species humanized and made human thought into part of a cultural line, but to Piaget language is only one of at least five behaviour patterns that manifest representational intelligence in the child.[2] Cognitive faculties, as language, are related to the level of intelligent adaptation, and language is one aspect of a general cognitive function, the semiotic function.

According to Piaget, the semiotic function is a representational ability that emerges when the child is about 18 months old. It is a unified capacity that enables the child to represent an object or an event that is not present (a signified) by means of another object that is present (a signifier). The progression of the sign function from constructing private (egocentric) symbols to mastering socially shared signs is an intellectual development in an active sense. But even if language is not the exclusive means of representation that emerges from the semiotic function there is every reason to affirm that also to Piaget language holds a prominent position in the cognitive development of the child (cf. Piaget 1970, p45; Piaget & Inhelder 1966, pp67-68; Piaget 1951, p273; Piaget 1947b, pp72,194; Piaget 1930, p63). The reason for this is the extraordinary disposition of language to resolve the confusion of the individual viewpoint with that of others.

Theories of signification

Piaget suggests a theory of signification that closely relates to his theories of the development of intelligence.[3] Intelligence is adapted behaviour and develops in the individual through epigenetic constructions that come about through interactions between mental structures and the environment (cf. Piaget 1947a, ch.1; Furth 1969, foreword by Piaget). Piaget's theory of

[2] The other manifestations of the symbolic (or semiotic) function are; deferred imitation, symbolic play, drawing, mental image and memory. Piaget & Inhelder 1966 42-43

[3] Intelligence to Piaget is adopted behaviour, by which he means the ability in the individual to constitute an equilibration between assimilation and accommodation. See for ex. Piaget& Inhelder 1966 46.

intelligence is based on biological stands, but as such it also implies social dimensions. Moreover he claims functional continuity in the development of intelligence from the sensory-motor level to the level of formal operations.[4] Sensory-motor intelligence concerns meaning constrained by praxis, present perception, and movements. Representational thought develops as the child turns from inhabiting an egocentric scheme-building world closely related to practice to live in a gradually expanding world of detached objects and schemes shared with other agents.

The cognitive development of the Vygotskian child is not described in terms of extended adaptations, as could be said about the Piagetian child, but in terms of a process of becoming a differentiated member of culture. But also to Vygotsky adaptation of the individual is part of cognitive development, and functional continuity constitutes its core. In relation to signification, as described by Vygotsky, the child has two different tasks to master, to understand and to communicate. To understand is to solve problems and is close to individual adaptation, while communication has social roots. But thought without speech will remain limited to immediate contextual perception, and "speech" without thought will stay at a rudimentary level, as for example in alarm calls, and it never can function as means for directing our mental operations (cf. Vygotsky 1999, ch.5, 185). The goal direction present in Piaget's theory is not enough to explain the process as a whole in Vygotsky's view: you also have to consider the means as crucial for the cultural line of cognitive development. Whereas Piaget outlines different behaviour patterns as manifestations of a unified cognitive capacity, Vygotsky includes the means as structural resources of thought. Words are not mere bearers of thought or packets of thought; thoughts come to existence *through* words. This could have opened up for a theory that draws up implications for development of different streams of thought grounded on different resources for meaning, that is, different systems of signs affording different structures for streams of thought – a truly semiotic theory. But to Vygotsky verbal thought is the only one that is elaborate. One restriction in his theory, as I see it, is that he regards generalisation as a verbal act and not as a more general capacity of mind.

Despite the differences between Vygotsky and Piaget, one stressing cultural affiliation and language, the other individual activity and a broader aspect of representation, there are similarities in their description of signification as a developmental process of the mind. To Vygotsky, culture provides the growing child with words as "tools" for communication, and

[4] The stages in cognitive development according to Piaget (in years of old) are: 0-2 The Sensory-motor period, 2-6/7 Preoperational thought (including development of symbolic and prelogic thinking between 2-4) 6/7- 11/12 Concrete operations and at last from 12 to adult Formal operations.

the child will use them before really understanding them. The development of concepts is a stage-like process from 1) using socially applied "words" as means for subjective creation of syncretic non-organized "heaps", via 2) complex thinking (with a higher degree of objective relations) and 3) pseudo-concepts (psychologically immature concepts in the chid) to 4) real concepts. This process is a dialectical process in the child relating the inner psychological aspects of word meaning (by generalisations) and the exterior structure of language. A tendency of categorization in the child is implied by the construction of "heaps", and gradually the child correlates its "heaps" with the ones of other persons in relation to its experiences in the real world. But it is not only a correlation of fitness in world/word meaning: it is also a psychological insight into the referential capacities of words.

Also to Piaget, as noted above, representation undergoes development. Meaning on the level of sensory-motor intelligence antedates the semiotic function that emerges in the preoperative stage and eventually develops into socialized and formalized operative stages. Piaget suggests a process of "actions" turning into "operations" in which a progressive regulation of the self (self-regulation) interacts with the increasing mastering of mental reversibility and mobility. The semiotic function gives rise to two different cognitive instruments according to Piaget; *symbols* and *signs.* In his terminology Piaget is closer to the Saussurean tradition than that of Peirce, in describing *symbols* as motivated and personal and *signs* as arbitrary and understood by convention (cf. Piaget 1951, p169; Piaget & Inhelder 1966, p45).

"Symbolism", as used by Piaget, is a concept hard to grasp even though it is an aspect of signification that is essential to him. It is essential because it maintains a functional continuity between stages. Symbolism constitutes the most dominating characteristic of representational meaning in the intermediate stage between sensory-motor activities (practical actions) and mature sign function. And partly it refers to aspects of representational meaning that have other implications and a reversed direction in development according to Vygotsky.

Symbolism and egocentrism

Symbolism is to Piaget the personal aspect of symbols; it begins with individual behaviour and serves the needs of representation of reality to the egocentric mind.[5] But symbolism is not restricted to pure symbols. It also intervenes in symbolic schemas and ludic symbols (both are

[5] Using the terminology of Piaget, symbolism has its origin in distorted assimilation serving the pleasure of the ego.

intermediate stages towards symbols according to Piaget) as well as in signs.[6] Symbolic play, for example, is satisfaction of the ego and has it own kind of belief, which is a subjective reality (cf. Piaget 1951, 168). *Representation* by symbolism (symbols) which is acquired in the pre-operative stages (2-7 years old) implies the characteristic differentiation of signifier and signified in the semiotic function, i.e. the ability to make an absent object present to the senses. But it is not yet freed as an instrument of thought, according to Piaget. Symbols in pre-operative stages do not imply the independence of the personal point of view, since the thought as a whole in is not yet differentiated from the ego in the child (cf. Piaget 1951, p168). Thus, according to Piaget, the differentiation of a fully-fledged sign involves two different (but related) types of differentiation; the differentiation of the signifier from the signified, and the differentiation of the self from the others.

The preoperative symbols of Piaget[7] and the "heaps" of Vygotsky correspond in several aspects, but the perspective in which they are presented is diverse. To the two of them these pre-concepts are based on concrete perception and fragmentary couplings (juxtapositions) of unrelated objects in the mind of the subject. To both these pre-concepts are transitory and unstable, as they lack the collective correlations of signs. Furthermore, to both the scarcity of objectivity marks the limit to the next stage. But whereas Piaget suggests that the symbols comprise meaning individually, since they are imitative images for the pleasure of ego or in service of the ego, Vygotsky emphasises the motivation stemming from social interaction between adult and child. From the start the child is born into a sign-using culture, and the child will be encouraged to take part in it. Vygotsky does not really explore the *origin* of language, as the signs are already there. The signs, the words, are delivered but not understood in the same way by children as by adults. In the beginning of the development of concepts in the child, the words perform the function of "heaps" for unstructured subjective impressions.[8]

---

[6] Note the difference between schem*e*s and schem*a*s. In symbolic schemas as above, *schema* "is a word used to indicate an elementary structure, particularly in the beginning of psychological life." Piaget 1951, p.vi. Especially Furth discusses the difference of schemes and schemas in Piaget's theory. Schemes are the result of the function of adaptive actions in mental structures, while schemas are less accommodative and occur in the "now and here dimension" (Furth 1969, p157). Furth gives an example in which he separates figurative schemas from figurative schemes: the spatial image (the picture) is a true schema or schematic outline, while the intelligent structure from which this schema derives can be called a figurative scheme (Furth 1969, p102).

[7] As for example ludic play or ludic language; Piaget 1951.

[8] To both Piaget and Vygotsky emotions constitute distinguishing qualities in thought and language. To Vygotsky they form a separate, but dialectically related, part of mind, and to Piaget they have a special connection to symbolism. In this article I do not elaborate on the emotional aspects in the theories of Piaget and Vygotsky. I will save this important aspect to be considered in another article.

According to Vygotsky, Piaget has erroneously reversed the development of thought and language when presuming the direction of development from near autism in the newborn infant via egocentrism to a socialized mind. The development of thought and language is the opposite, Vygotsky suggests, from the social to the individual. Egocentric speech does not, as Piaget claims, decline as the child grows up, quite the contrary, it undergoes development according to its specific functions, to differentiate the individual from culture (cf. Vygotsky 1999, 434). As we can see, self-regulation has a central role in cognitive development to both Vygotsky and Piaget, but they differ in their description of how to become aware of oneself. Perhaps this is a divergence partly due to different interpretations of egocentrism. Egocentrism to Piaget is not the same as being occupied by oneself; it is the lack of consciousness of the self. The egocentric child is an immature self. By means of emerging self-regulation the child will be able to embrace the perspective of others and become aware of itself (cf. Piaget 1973 (1968) chap2 §4; Piaget 1930, 6, 22, 63-69). To Vygotsky the individual must find its demarcation from culture, and to support this process it will foster egocentric speech.

The semiotic function in the picture sign

Neither Vygotsky nor Piaget explicitly explores picture comprehension or the development of the picture sign, but even so their work on the development of representational abilities in the child are relevant to consider when you study children's understanding of pictures. When Piaget observes drawing as one of five manifestations of the semiotic function, his focus is on the act of drawing as a representational competence that implies symbolic play and mental images. But from a Vygotskian perspective, picture comprehension and drawing are related without being identical. The prerequisites for drawing differ from picture comprehension, and the act of drawing is quite different from the act of understanding pictures. However, if the semiotic function to Piaget is the capacity to represent an absent signified with a present signifier, this also must be the case in the acquisition of the picture sign. The act of drawing in the child in the preoperative phase is symbolic, in his sense, since it satisfies an egocentric need of pleasure and a personal need to understand one's reality. Also to Piaget an emergent picture comprehension must be understood within this activity-based theoretical framework that implies a development of meaning construction from individual activity to socially shared systems. And theoretically the ecological foundations for the substructures of schemes in perception and action offer a possibility for early picture comprehension. Conditions based on ecological aspects of pictorality have been emphasized by Sonesson, referring to the

ecological physics of Gibson and to the development of the semiotic function according to Piaget. The mere recognition of known objects in pictures does not seem to be the problematical part of picture comprehension to the child. This was shown in a famous test by Hochberg and Brooks on their 19 months old child's first experience of pictures and also more recently by Judy DeLoache who observes picture recognition in children as young as five months old.[9] Also to animals that share some qualities of human vision, some of the information supplied by a picture of an object seems to be available. Pigeons, chickens and non-human primates are shown to be capable of recognizing some correspondence between pictures and the depicted scenes (cf. Fagot J, ed, 2000). But the spontaneous ability to recognize familiar objects in pictures should not be interpreted as equivalent to the comprehension of the nature of pictures, within a relation between a picture and its referent. Two important aspects regarding the picture sign must be noted, and the first is what has been called *the paradox of pictures* by Gibson and *dual representation* by DeLoache (cf. Gibson 1966; 1979; DeLoache 2003; 2002; 1994). The picture surface is simultaneously conceived as a surface in itself and as something referring to something not present. If only the object depicted is present to the senses, then it would not be a representation by a sign, but just another example of the object depicted, though perhaps a divergent one. Secondly, a picture is at least twofold, related to what Sonesson calls "Lifeworld hierarchies".[10] Like all signs, the picture sign is asymmetric i.e. the picture stands for the world (referent), not the reverse. Furthermore, experiences of real life are transferred into the picture by the interpreter. The asymmetry condition gives rise to what Sonesson calls *primary* and *secondary iconic* signs. In primary iconic signs the sign relation is clear because the practice of the asymmetry is obvious for the subject, but in secondary iconic signs the asymmetry and the sign relation have to be pointed out to the subject or be part of a cultural habit. The second condition has by Sonesson been subdivided into four dimensions of pictorial rhetoric. It would take me too far to present them here, but I will mention that the four dimensions are related to the "Lifeworld" by expectation of integration, similarity (or dissimilarity), fiction and the dimension concerning the deviation from social norms of picture use.

[9] J S DeLoache 1994. Hochberg J & Brooks V, the experiment published 1962 in *American Journal of Psychology*, 75, 624-628.

[10] For the concept of "Lifeworld" Sonesson refers to the phenomenology of Husserl, and the "lifeworld hierarchies" are grades in the prominent layers of reality that we take for granted. Sonesson 2004, 1996/97

In her studies of the child's development of picture comprehension, Tara Callaghan argues for symbolic understanding as having social precursors (cf. Callaghan 2004; 2000; 1999).[11] Her theoretical framework is close to that of Vygotsky, further extended in the social dimensions by for example Tomasello and Woodward. In social interaction the child successively constructs its understanding of pictures. Pictures surround the child from the start, delivered as tools for communication, but not conceptually understood as such by the child. Callaghan stresses two social mechanisms, the inference of communicative intentions from the actions of others (cf. Tomasello 1999; Woodward 2003; 1999) and the imitative learning mechanisms of the child.[12] These mechanisms enable the child to respond to support in constructing symbolic understanding. Callaghan also suggests, consistent with Vygotsky, that the development of the understanding of the semiotic function (which she calls the symbolic function) is scaffolded by language.

Perhaps closer to Piaget, DeLoache argues that pictures serving as guides for action in the child indicate some level of pictorial understanding. In a series of retrieval tests she has documented a rapid change in the ability of children at the age of two and a half to three years to use symbols as guides for action (cf. DeLoache 2004; 1999; 1987). This finding confirms the idea of a cognitive change as a semiotic function but, as argued by Callaghan (2004), it does not demonstrate a psychological insight into a concept in the sense of Vygotsky. In her retrieval tests DeLoache also shows that the dual nature of symbols is harder to attain from some objects than from others, and this might indicate the confusion of asymmetry in sign relations noted by Sonesson.

The development of "symbol-mindedness of young children" as expressed by DeLoache (2002) or the semiotic function according to Piaget is crucial to the studies of signs and other meanings. The sign is always a sign to someone and its meaning emerges, is preserved and changes with its users. This is true of verbal signs as well as of pictorial signs. Picture comprehension in the child should be studied as a developmental process in accordance with cognitive development in the child and the cultural use of tools mediating (and constructing) meaning. This we can learn from Vygotsky and Piaget. Socially shared meaning has its roots in socially shared experiences, but this is not inconsistent with the importance of individual constructive processes.[13] Generative structures, which evolve out of adapted action in the individual and in culture, sustain cognitive development according to both Piaget and

[11] "Symbolic" is here not meant as a personal signifier as in the sense of Piaget, but in a more general sense of being sign-related and this also accounts for terminology in the discussion of DeLoache below.
[12] In this respect Callaghan does not refer to Piaget 1951(1945) but to for ex. Meltzoff A & Moore J, 1977
[13] See also Liben 2004 38

Vygotsky. To Piaget these structures descend from schemes that emanate from individual interaction with the environment and later from shared representations. Vygotsky, on the other hand, emphases reorganisation in the systemic structure of consciousness as due to internalisation of cultural and social activity.

According to Vygotsky, the development of concepts is a life-long process in which the streams of language and thought intervene in the mind of an individual, but to Piaget the development serves an end. Schemes are instruments of adaptation, and normally schemes have an end, according to Piaget, and that end is the concept.[14] True concepts are stable, and to become stable they must be implemented in a broader schematization than in that of the experiences of an individual. Therefore they have to be interpersonal.

Bibliography

Callaghan T. C., Rochat P., MacGillivray T. & MacLellan C., 2004 – "Modeling referential actions in 6- to 18-month-old infants: A precursor to symbolic understanding", *Child Development*, 75, p. 1733-1744.

Callaghan T. C., 2000 – "Factors affecting children's graphic symbol use in the third year. Language, similarity, and iconicity", *Cognitive Development*, 15, p.185-214.

Callaghan T. C., 1999 – "Early understanding and production of graphic symbols", *Child development*, 70, p.1314-1324.

DeLoache J. S., Simcock G. & Marzolf D. P., 2004 – "Transfer by very young children in the symbolic retrieval task", *Child Development*, 75, p. 1708-1718.

DeLoache J. S., Pierroutsakos S. L. & Uttal D. H., 2003 – "The origins of pictorial competence", *Current directions in psychological science*, 12, p.114-118.

DeLoache J. S., (2002) – "The symbol-Mindedness of young children", *Child psychology in retrospect and prospect*, 32, p73-101, The Minnesota symposia on child psychology.

DeLoache J. S., 2000 - "Dual representation and young children's use of scale models", *Child Development*, 71, p.329-338.

DeLoache J. S., Peralata de Mendoza O. A. & Anderson K. N., 1999 – "Multiple factors in early symbol use: Instructions, similarity, and age in understanding a symbol-referent relation" *Cognitive Development*, 14, p.299-312.

[14] Cognitive development is to Piaget generally about transporting real life into equalized schemes of assimilation and accommodation in the mind of the beholder. The goal direction implicit in his theories has effects on how he understands the activities in, and the destinies of, subordinate levels of development. See for example a critique of play by Sutton-Smith 1966 discussed in Schwartzman 1978 268. (For Piaget's response see Piaget 1966). See also Golomb's critique of Piaget applied to the development of drawing. Golomb 2002 10-12

DeLoache J. S. & Burns N. M., 1994 - ”Early understanding of the representational function of pictures”, *Cognition*, 52, p.83-110.

DeLoache J. S., 1987 – “Rapid change in the symbolic functioning of very young children” *Science*, 238 p.1556-1557

Donald M., 1991 - *Origins of the modern mind, three stages in the evolution of culture and cognition*, Harvard University Press

Fagot J., (ed) 2000 - *Picture perception in animals*, East Sussex, Psychology Press Ltd.

Furth H. G., 1969 - *Piaget and knowledge*, New Jersey, Prentice-Hall.

Gibson J. J., 1979 – *The ecological approach to visual perception*, Boston, Houghton Mifflin Company.

Gibson J. J., 1966 – *The senses considered as perceptual systems*, Boston, Houghton Mifflin Company.

Golomb C., 2002 - *Child art in context, a cultural and comparative perspective*, Washington, DC, American Psychological Association.

Krampen M., 1991 – *Children’s drawings, iconic coding of the environment*, New York, London, Plenum Press.

Meltzoff A. & Moore J., 1977- “Imitation of facial and manual gestures by human neonates”, *Science*, 198, p.75-78.

Piaget J., 1973 (1968) – *Språk och tanke hos barnet* (original title: *Le langage et la pensée chez l’enfant*. 1968 Neuchâtel-Paris, Delachaux&Niestlé S.A.)

Piaget J., 1970 (1968) - *Genetic epistemology*, New York-London, Columbia University Press

Piaget J., 1966 – “Response to Brian Sutton-Smith” *Psychological Review*, 73, 111-112.

Piaget J. & Inhelder B., 1966 – *La psychologie de l’enfant*, Paris, Presses Universitaires de France.

Piaget J., 1951 - *Play, dreams and imitation in childhood*, London, Routledge&Keagan Paul Ltd. Second impress. 1967. (orgiginal title *La formation du symbole chez l’énfant*, 1945)

Piaget J., 1947a- *La psychologie de l’intelligence*, Paris Collection Armand Colin

Piaget J., 1947b, third edition (1924) - *Le jugement et le raisonnement chez l’enfant*, Neuchâtel-Paris, Delachaux&Niestlé S.A.

Piaget J., 1930 2nd ed (1923) *Le langage et la pensèe chez l’enfant* Neuchâtel-Paris, Delachaux&Niestlé S.A

Sebeok T. A. 1994 – *Sign: An introduction to semiotics*, London, Pinter.

Sebeok T. A. 1972 - *Perspectives in zoosemiotics*,The Hauge, Mouton.

Sonesson G., - “Language, gesture and pictures from the point of view of semiotics development” Working Papers of the SGB-project, 3. http://www.arthist.lu.se/kultursem/pro/SGBWP3.pdf

Sonesson G., 2004– “Rhetoric from the standpoint of the Lifeworld” unpublished paper

Sonesson G., 1996/1997 – “Approaches to the lifeworld core of pictorial rhetoric”, *Visio*1,3, p.49-75.

Sonesson G., 1992 – *Bildbetydelser*, Lund, Studentlitteratur.

Sonesson G., 1989 - *Pictorial concepts*, Lund University Press.

Schwartzman H. B., 1978 – *Transformations, the anthropology of children’s play*, New York-London, Plenum Press.

Sutton-Smith B., 1966 - “Piaget on play: a critique” *Psychological Review*, 73, p.111-112

Tomasello M., 1999 – *The cultural origins of human cognition*, Cambridge MA: Harvard University Press.

Tryphon & Vonèche (eds) 1996 – *Piaget-Vygotsky, The social genesis of thought*, Sussex UK, Psychology Press.

Vygotsky L. S., 1999 (1934) – *Tänkande och språk*, Göteborg, Daidalos AB (orgiginal title *My_lenie i re_*).

Vygotsky L. S., 1978 – *Mind in Society*, Cambridge MA, London, Harvard University Press.

Woodward A. L., 2003 – “Infants’ understanding of the link between looker and object” *Developmental Science*, 6, p.297-311.

Woodward A. L., 1999 – “Infants’ ability to distinguish between purposeful and non-purposeful behaviours” *Infant Behaviour and Development*, 22, p.145-160.

Wozniak R. H., 1996 – “Qu’est-ce que l’intelligence? Piaget, Vygotsky, and the 1920s crisis in psychology” in *Piaget-Vygotsky, The social genesis of thought*, Tryphon & Vonèche (eds), Sussex UK, Psychology Press.
