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Jyrki Reunamo
Ph.D. Senior Lecturer
Department of Applied Sciences of Education
University of Helsinki
P.O.Box 9 (Siltavuorenpenger 20 M)
FI-00014 University of Helsinki
Tel. +358 9 19129631, Mobile +358 50 3609113

Abstract

A systemic hierarchical feedback- model is formed, with influences acquired from Hacker's action model. Learning is fundamentally a social process. The learning is at first interpersonal at the zone of proximal development, culture mediated and gradually adapted into children's actual development. A person works with these adapted (learned) tools and produces personal outcomes and acquires personal agency. Further on, this new content can be shared by others and processed further in shared agency. Eventually, this shared content can be processed again in the zone of proximal development.

The model gives implications for teaching also. As learning is a culturally mediated process, the teacher needs to find a shared, common understanding. Teachers need to know the level of children's actual development to help children with their deficiencies. Teachers need to acknowledge children's personal aspirations and content, in order to help children to become the agents of their life. Eventually, teachers and children work together producing new cultural content and ways to interact with others. All levels and phases of the model are an important part of the whole.

Keywords: Vygotsky, Agency, system analysis

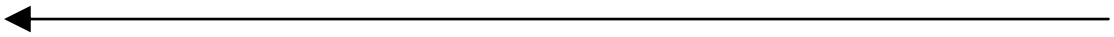
Vygotsky A systemic approach

The purpose of the article is to arrenge Vygotsky's basic ideas into a dynamic systemic model. In systems theory, the models of static objects of reality are replaced by looking at systems as somewhat autonomic organizations, which are subsystems of higher systems (Bowler, 1981). Bronfenbrenner's ecological systems theory is a well-known example of systemic model (Aldridge, Sexton, Goldman, Booker, & Werner, 1997). According to Brandstädter (1984), in systems analysis for example hierarchy and comparison-change-feedback units are important. If a good hierarchical feedback-model can be created, it can tested empirically and the dynamics of development become easier to get a hold on. System analytic models describing human action and learning are often goal-oriented (cf. Nechensky, 2007). What makes Vygotsky interesting is that in his thinking the basic unit of action is the interaction that mediates cultural content. Van Geert (2000) suggests that Vygotsky's ideas can be used as a basis for a self-organizational model describing developmental paths. The purpose of the article is to arrenge Vygotsky's central ideas into a hierarchic feedback model, which could be tested empirically or used as a pedagogical model for learning.

This presentation is organized according totwo principles that are important in Vygotsky's work and put in consecutive order. First there is the continuum from interpsychological to intrapsychological (Vygotsky 1962, Vygotsky 1978). Secondly, there is the continuum from acting within the existing reality to creating the future and altering the present (Vygotsky 2004, pp. 7-8). First the continuums are studied shortly and then a fourfold table is made of the two continuums, resulting in four different functions phases of interaction.

Interpsychological vs. intrapsychological

Vygotsky (1978) describes the first continuum from interpsychological to intrapsycholigical: An operation that initially represents an external activity is reconstructed and begins to occur internally … An interpersonal process is transformed into an intrapersonal one. Every function in the child's cultural development appears twice. first, on the social level, and later, on the individual level; first, between people (interpsychological), and then inside the child (intrapsychological). All the higher functions originate as actual relations between human individuals. Aspects of external or communicative speech as well as egocentric speech turn "inward" to become the basis of inner speech. (Vygotsky 1978, pp. 56-57.) Vygotsky describes the development of the language functions starting between people and only after that inside the child. According to Vygotsky (2004), this applies also to imagination. "Everything the imagination creates is always based on elements taken from reality, from a person's previous experience ... Imagination always builds using materials supplied by reality. It is true … that imagination may create more and more new levels of combination, combining first the initial elements of reality (cat, chain, oak), then secondarily combining fantastic elements (mermaid, wood sprite), and so forth, and so on. But the ultimate elements, from which the most fantastic images, those that are most remote from reality, are constructed, these terminal elements will always be impressions made by the real world (Vygotsky 2004, pp. 13-14). The interpsychology vs. intrapsycholgy differences are condensed in Figure 1. The arrow points the direction of the relationship.



Intrapsychological	Interpsychological
1. Individual level 2. The child begins to master his attention, freeing him to reconstruct perceptive field 3. External stimuli can be used as an instrument for organizing the task 4. The content of memory recollections is guided by the thinking process, e.g. logical relations 5. The activity is turning inward, gradually becoming inner functions S 6. cientific concepts organized into a system of generalized relations	1. Social level 2. The attention is guided by external stimuli 3. External signs needed for thinking and language tools 4. The content of thinking act is determined by concrete memory recollections 5. The signs are presented or attached as external forms of activity 6. Concrete spontaneous concepts have no distance from the immediate experience

Figure 1. The interpsychological vs. intrapsychological activities (cf. Vygotsky 1978, pp. 31-57; Vygotsky, 1962, pp. 116-117; Reunamo & Nurmilaakso, 2007, p. 315)

Vygotsky (1978) describes: "The internalization of cultural forms of behaviour involves the reconstruction if psychological activity on the basis of sign operations. Psychological processes as they appear in animals actually cease to exist; they are incorporated into this system of behaviour and are culturally reconstituted and developed to form a new psychological entity. The use of external signs is also radically reconstructed. The developmental changes in sign operations are akin to those that occur in language. Aspects of external or communicative speech as well as egocentric speech turn "inward to become the basis of inner speech." (Vygotsky 1978, p. 57.)

Cultural products vs. cultural production

The other important continuum for Vygotsky is from using cultural products to producing culture. The idea of perception piercing through matter is already manifested in his early writings (first published in English 1971) presenting Vygotsky's works in the years1915 to 1922. Although not in very cohesive way but still clearly Vygotsky sees the central point of dialectic equilibrium as he describes the role of art in children's lives: "The art is the

supreme method for finding an equilibrium between man and his world, in the most critical and important stages if his life" (Vygotsky 1971, p. 259). It is important to see the difference between Vygotsky and Piaget. Piaget studies the equilibrium between accommodation and assimilation, processes embedded within the child (cf. Kitchener 1986, pp. 54-61). Already in the early 1920s Vygotsky looked at the equilibrium between inner and environmental changes.

Even though Vygotsky was an early discoverer of the agentive role of children's thoughts and action, we must acknowledge, that he was not the first one. The father of early childhood education, Friedrich Froebel, was influenced by Hegel's dialectic nature of evolution. As Curtis & Boultwood (1958) describe, Froebel saw the knowledge processes changing the environmental development process itself. According to Froebel, life is an evolutionary process, and education enriches this evolution. Human beings can thus discover a more profound idea of their own evolution and, in such a manner; the idea can become an evolutionary property in itself. (cf. Curtis & Boultwood 1958, pp. 374-375.)

Marx and Engels were influenced by Hegel's dialectics too. Then again, Vygotsky's study of human development was deeply influenced by Friedrich Engels, who stressed the critical role of labor and tools in transforming the relation between human beings and their environment (cf. John-Steiner and Souberman 1978, pp. 132). In his book "Thought and language" (1962, first published posthumously 1934) Vygotsky is not anymore interested in the cultural productive nature of communication. Rather, he concentrates on the inner workings of thought and language and also in the developmental history of language, not language as history producer. In the collection "Mind in society" (1979, edited from original writings in 1930s) the idea of culture production is included occasionally. Nevertheless, most clearly Vygotsky discusses the process of history production in his book "Imagination and Creativity in Childhood" (2004), originally published in 1930. The book was long obscured

by later writings in west. It was first translated in Italian in 1972 and in Swedish in 1998 (cf. Lindqvist 1998, p. 7).

The later compiled more famous books omit the central idea of children's agency. The reader starts to wonder the role of censorship in the later works, because it is hard to understand the sudden absence of a central idea deeply rooted in Vygotsky's background. Nevertheless, in "Imagination and Creativity in Childhood" Vygotsky description is clear: "All human activity … that results not in the reproduction of previously experienced impression or actions but in the creation of new images or actions is an example of … creative or combinatorial behaviour. The brain is not only the organ that stores and retrieves our previous experience, it is also the organ that combines and creatively reworks elements of this past experience and uses them to generate new propositions and new behaviour. If human activity were limited to reproduction of the old, then the human being would be a creature oriented only to the past and would only be able to adapt to the future to the extent that it reproduced the past. It is precisely human creative activity that makes the human being a creature oriented toward the future, creating the future and thus altering his own present." (Vygotsky 2004, p. 9.) In Figure 2 the central differences between working with culture products and producing culture, which Vygotsky describes at length throughout the book, are described. The arrow shows the direction of the relationship.

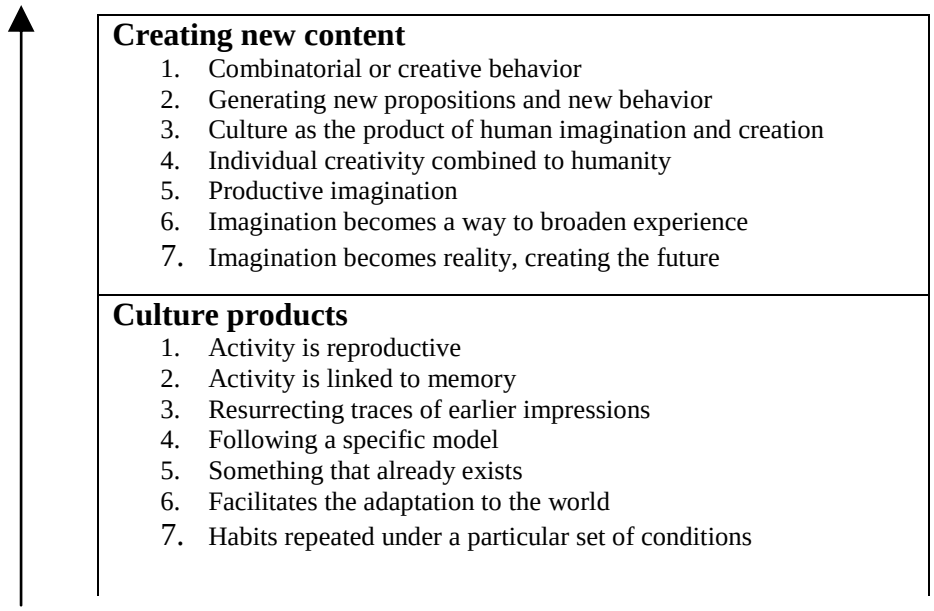


Figure 2. Activities with culture products and activity in producing culture (Vygotsky 2004)

The agentive nature of children's actions and views has been discussed at length in recent years (see Cooney & Selman, 1980; Reunamo, 1988; James & Prout, 1997, pp. 4-5; Solberg, 1997, pp. 126-127; and Corsaro, 1997; Reunamo, 2007b; Reunamo, 2007c). According to Mayall (2002), a social actor does something, perhaps something arising from a subjective wish. The term agent suggests a further dimension: negotiation with others, with the effect that the interaction makes a difference – to a relationship or to a decision, to the workings of a set of social assumptions or constraints. When children are seen as agents, they are seen as contributors to the social order (Mayall, 2002, 21, 178). Even withdrawing children may find their personal channels for impacting others (Reunamo 2005). It is not only the matter what children can do, it is more how effectively they can apply their skills when needed (Reunamo & Nurmilaakso 2006).

As Galperin observes (cf. Arievitch and Haenen, 2005), the ability of looking ahead (orientation) is a precondition to and even a prime aspect of learning. Bodrova and Leong (2006) discuss the impact of Vygotsky's ideas on pedagogy. They point out that to develop

self-regulation children need to engage in regulating others too. By discussing and planning, children engage in high levels of both “self-“ and “other-regulation” (Bodrova and Leong 2006, pp. 206-220). The more accustomed the children are to participating in the processes of their surroundings, the more prepared they will be for participating also as adults (cf. Reunamo 2004.)

Now we are ready to unite Vygotsky’s ideas about language development according to his two central theoretical continuums, which have often been described separately. In Figure 3 a fourway table of the two continuums is formed (Reunamo, 2007a). The theoretical aspects of combining adaptation and agency in the same model can be seen in Figure 3

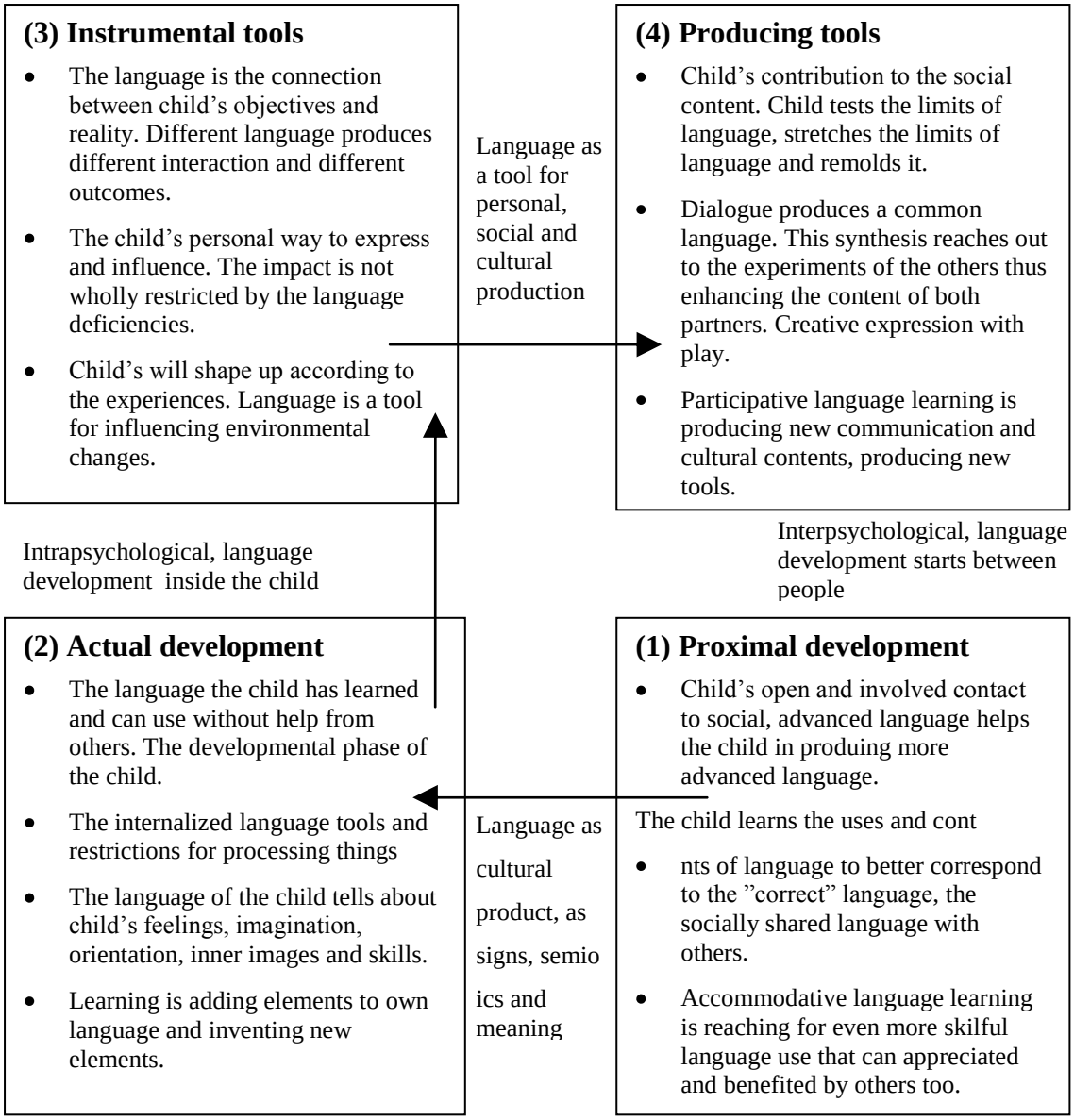


Figure 3. Vygotsky's ideas of language development arranged according to social and agentive continuums (Vygotsky, 1962; Vygotsky, 1978; Vygotsky, 2004; Reunamo & Nurmilaakso, 2007, p. 317)

Proximal development

In the first type of development presented in the south-east corner of the Figure 3, the developmental aspects are interpsychological and they do not concentrate on the culture production; rather, cuture is seen as something that can be can be learned with the assistance of others.

Vygotsky (1988, p. 268) emphasised the contexts of learning, social interaction. He demonstrated the social and cultural nature of the development of the higher functions, i.e. its dependence on cooperation with adults and on instruction. The zone of proximal development is perhaps Vygotsky's (1978) most famous idea. In his description Vygotsky concentrates on the child's development, not on the culture produces by the interaction. The zone of proximal development is defined as the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. The zone of proximal development defines those functions that have not yet matured but are in the process of maturation, functions that will mature tomorrow but are currently in an embryonic state. The zone of proximal development characterizes mental development prospectively and permits us to delineate the child's immediate future and his dynamic developmental state, allowing for what is in the course of maturing. We can predict what will happen to these children between five and seven, provided the same developmental conditions are maintained.

According to Vygotsky (1978) by using imitation, children are capable of doing much more in collective activity or under the guidance of adults. The only "good learning" is that which is in advance of development. The acquisition of language can provide a paradigm for the entire problem of the relation between learning and development. Language arises initially as a means of communication between the child and the people in his environment. Only subsequently, upon conversion to internal speech, does it start to organize the child's thought, that is, becomes an internal mental function. Vygotsky 1978, pp. 88-89.)

Vygotsky (1978) acknowledges that communication produces the need for checking and confirming thoughts, a process that is characteristic of adult thought. In the same way that internal speech and reflective thought arise from the interactions between the child and

persons in her environment, these interactions provide the source of development of a child's voluntary behaviour. A child first becomes able to subordinate her behaviour to rule in group play and only later does voluntary self-regulation of behaviour arise as an internal function.

According to Vygotsky (1978), learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with his peers. Once these processes are internalized, they become part of the child's independent developmental achievement. Learning is not development; however, properly organized learning results in mental development and sets in motion a variety of developmental processes that would be impossible apart from learning. Thus, learning is a necessary and universal aspect of the process of developing culturally organized, specifically human, psychological functions. The developmental process lags behind the learning process. Learning turns into development, but the complex processes cannot be encompassed by unchanging presuppositions. The teacher should have a contact in the mental processes stimulated by the course of school learning and carried through inside the head of each individual child. (Vygotsky 1978, pp. 90-91.)

According to Reunamo (2007a), child's different language skills are not just deficient, they express child's personal orientation, motifs and strategies to deal with the world. In the perspective of the educator it is important to get in contact with child's ways of using language as skills, not insufficiency. Child's own language is a mirror to child's abilities and personality and important thing to him, the educator gets familiar with the territory of world according to the individual child (Reunamo, 2007a, pp. 89-98).

Vygotsky restrains himself from examining the children's effect on the other, e.g. on the interacting adult. As Hakkarainen (2002) describes, the zone of proximal development is different, when there is a new creative task at hand, in which even the adult does not have a readymade solution. The zone of proximal development is clearly meant for reproductive

problems, in which the other knows the answer in advance or can solve it along the lines of previous experience. Some actions produce novel artifacts, which can be used as a tool in the next action. Culture-historical development is not a cumulative process; it is rather a new organization of systems both between and within systems (cf. Hakkarainen 2002).

In proximal development there is also a side that Vygotsky did not elaborate on and that is children's ability to help adults for better communication (Reunamo, 2007a, p. 93). We need to only look at a small baby in interaction with his grandfather. The grandfather may usually be quite proper and verbally accurate person. If another adult asks him to babble and gurgle he maybe could not or would not do it. But in a matter of seconds a small baby can turn a stiff grandfather into an eloquent and mobile mime artist full of emotional expression and tacit communication. That is the level of proximal development for the grandfather. The child helps grandfather to get in contact with, and to express, his feelings better. The grandfather maybe thinks that he is just playing, but the truth is he would not reach the same emotional and personal expressions without the child. Maybe it would be more proper to redefine the level of proximal development as a zone of mutual experience and contact. (Reunamo, 2007a, p. 93)

Actual development

The second type of development described here is intrapsychological. The developmental aspects of this type of development do not concentrate on the culture production; rather, language is seen as cultural product, as signs, semiotics and meaning. According to Vygotsky (1978) the first level can be called the actual developmental level, that is, "the level of development of a child's mental functions that has been established as a result of certain already completed developmental cycles. When we determine a child's mental age by using tests, we are almost always dealing with the actual developmental level.

In studies of children's mental development it is generally assumed that only those things that children can do on their own are indicative of mental abilities (Vygotsky 1978, pp. 85).

A child's actual developmental level (cf. Vygotsky 1978) defines functions that have already matured, that is, the end products of development. If a child can do such-and-such independently, it means that the functions for such-and-such have matured in her. The actual developmental level characterizes mental development retrospectively it is about developmental cycles already completed and a summary of them (Vygotsky 1978, pp. 86).

According to Gullo (2005) the evaluation and concern of children's actual development level is important. The tests inform curriculum and instruction. The developmental screening tests can be used to measure children's potential for learning. They are suited for comparing an individual child's score with those of other children of similar age. The skills related to communication and thinking include language comprehension and expression, reasoning, counting and recalling sequences from auditory stimuli. With diagnostic test it is possible to identify the existence of a disability or specific areas of academic weaknesses as well as to suggest potential remediation strategies. Many early childhood programs use achievement tests to assess children's progress or level of attainment, which measures that extent to which an individual has achieved certain information or attained skills that are identified within curricular objectives (Gullo 2005, pp. 45-47).

Concentrating on the actual development and on tests have disadvantages too (Gullo 2005). Norm-referenced assessments do not reflect curriculum sensitivity. They are often based on skill development approaches and reflect a theoretical perspective that is more behavioural than constructivist. They assess specific skills or knowledge learned rather than the process of learning. This often leads to teachers teaching to the test, and thus the norm-reference assessment has the effect of narrowing the curriculum. The tests can inadvertently

reinforce developmental difference and solidify student status. The tests may segregate children, they ignore children's experiences and they present a narrow picture of children (Gullo 2005, pp. 66-73).

Vygotsky (1978) criticises further the concentration on the level of actual development. In evaluating mental development, consideration is given to only those solutions which the child reaches without the assistance of others, without demonstrations, and without leading questions. The implication to solve a variety of more advanced problems is not studied. By using tests, we determine the mental development level with which education should reckon and whose limits it should not exceed. It can result not only in a failure to help children in their development but also by reinforcing their handicaps by accustoming children to the forms of earlier development and suppressing the rudiments of advancing. Vygotsky limits the level of children's actual language learning to assimilating new words or mastering operations such as addition or written language. (Vygotsky 1978, pp. 88-90.)

We can see that the actual development fits within the south-west corner of the model presented in Figure 3. Nevertheless, we must further on acknowledge that also intrapsychological development can be creative and productive. The richer the experience the child has acquired, the richer and more productive the act of imagination can be (Vygotsky 2004, pp. 15-16). As long as the child keeps his imagination to herself, the products (tales, play etc.) are unreal. Intrapsychological creativity can enrich and produce new content in children's experiences. According to Vygotsky (2004), even if an imaginative construct does not in itself correspond to reality, the feeling it evokes are real. A musical composition can induce a whole complex world of experiences and feelings in a person listening to the music. This expansion and deepening of feelings, their creative restructuring constitutes the psychological basis for the art of music (Vygotsky 2004, pp. 20). The child recreates music.

Creativity can also lead away from reality (Vygotsky 2004). Children can for example retreat into dreaminess, escape into an imagined world, withdraw or isolate themselves (Vygotsky 2004., p. 37). We can say that this kind of imagination is intrapsychological and is not directed towards environmental change.

According to Reunamo (2007a, p. 90), this kind of language development can be described as closed and adaptive. The language is seen as child's abilities or skills. When the child's use of language is different from the legitimate language use, it is often interpreted as erroneous expression or a mistake. Children's use of language seems deficient. But the language is still important and legitimate for the child, because it is a tool for communication. Child's actual language skills are like a toolbox for child's own tools, which child uses for his own purposes and his own personal ways.

Child produces also a lot of language that is not correct (Reunamo, 2007a, p. 90-93). The younger the children the more they communicate non-verbally. Baby's communication is very different from the proper use of adult speaking. Nevertheless, the young child is capable of efficient, even interactive communication without words and grammar. He communicates with the whole of his body actively seeking for contact. The secret for the effective communication is the integration of the whole personality with all the emotions and aspirations mixed within. We should not consider child's contact to his feelings, needs and motifs for orientation as something primitive or undeveloped. Children's ability to express themselves directly, emotionally, unrestrained and right to the point should be cultivated to ensure that the ability is not lost in the course of development. The more important the message, e.g. hunger, fear or need for affection, the more effective the child's communication. In the perspective of the early childhood educator this means that we should not only be interested in developing children's language skills to be more correct or perfect. Correct is not a synonym for effective. Children's communication is a path to the heart of

their being. That is valuable in itself. (Reunamo, 2007a, p. 91) Podmore, Sauvao and Mapa (2003, p. 35) emphasize that when young children move from one educational setting to another it is important to understand the cultural context of their prior experiences, given that children's culture-specific experiences, that their development of language and literacy skills, are interconnected.

In Finland Karlsson and Riihelä (Karlsson 2004) have developed a method of writing down children's stories (sadutus). The child produces a story, the adult writes it down exactly as the child tells it. In the end the adult reads the child's story aloud and checks that it is the child meant it to be. This kind of language production helps adults to get in contact with children's language and inner world and also helps in children's participation as bringing children's ideas forward as interesting and worth processing further (Karlsson 2004).

Instrumental tools

The third type of development described here is intrapsychological and the focus of the development is on the culture production, language is seen as a tool for personal, social and cultural production. According to Vygotsky (2005), while at a year and a half, the child makes a discovery – everything has a name. Later, in play, the child discovers that each thing has its meaning; each word has its meaning, which can replace the concrete object. Internalization is based on emancipation of the word from the thing in play. But the child needs concrete other things to support the emancipation of words from concrete objects. To separate the meaning of horse from the real horse the child still needs another concrete object to support the image for example using a stick as a horse. The same applies to goals. First the child's goals are inseparable from the real things. Voluntary intention and motives associated with the will arise in play. Play gives the child a new form of desire, that is, teaches him to want. The child desires and fulfils his desire, passes the main categories of reality through his experience. The will, an internal process, becomes to external action. The route from

separating meaning from the thing is similar to the route of becoming conscious of desires and motifs. Voluntary choice, decisions, conflicting motives, and other processes start to separate from implementation. The route to will is the route to thinking. In fact, random performance becomes more difficult (because it is blind) than conscious choice (Vygotsky 2005). Thus, the goals, signs and language start to function as tools and instruments for environmental change.

According to Vygotsky (2004), a child's play is not simply a reproduction of what he has experienced, but a creative reworking of the impressions he has acquired. The child combines impressions and uses them to construct a new reality, one that conforms to his own needs and desires. We have a situation that the child has created. All known elements from previous experience are combined into something new that belongs to the child himself. It is this ability to combine elements to produce new structure, to combine the old in new ways that is the basis of creativity. Vygotsky states that a construct of fantasy may represent something substantially new, never encountered before in human experience and without correspondence to any object that actually exists in reality: however, once it has been externally embodied, that is, has been given material form, this crystallized imagination that has become an object begins to actually exist in the real world, to affect other things. In this way imagination becomes reality (Vygotsky 2004, pp. 11-20).

Vygotsky (2004) sees us using our imagination and constructs as tools or instruments for change. If the life surrounding does not present challenges to children, if the usual and inherent reactions are in complete equilibrium with the world around him, then there will be no basis for him to exercise creativity. A creature that is perfectly adapted to its environment, would not want anything, would not have anything to strive for, and, of course, would not be able to create anything. Creation gives rise to needs, motives and desires. Moreover, a product of the imagination, which has arisen in response to our drive and inspiration, shows a

tendency to be embodied in real life. The imagination tends to become creative, that is, to actively transform whatever it has been directed at (Vygotsky 2004, p. 29, p. 41). Language becomes a tool and an instrument for an individual for environmental change.

A small child as a comprehensive being participates with his/her whole body, seeking contact and finding the effects of his or her actions. It is the task of the education to recognize the expressions concerning child's needs, motifs and well-being. In perceiving agency on the adult the children's expression can advance and the world can take a personal shape for the child. Sometimes a small child is seen as incompetent or defiant communicator, but we need to only look at the family that the baby is born into. Suddenly the parents' life is changed irreversibly. The baby effectively changes the family dynamics to suit his/her needs and aspirations and there is nothing the parents can do about it.

To complement children's story telling (sadutus) we could establish a tradition of "action telling" ("todetus"). In it children could describe what they would like to happen for example in the gymnastic exercises, the adult would write children's ideas down and checks that it is according to children's meaning and then children's ideas would be realized to the letter. That makes a great workout for the problematic relationship between reality and imagination.

Producing new cultural tools

The fourth type of development, described in north-east corner of Figure 3, is interpsychological and the focus is on producing cultural tools. This means that language is not only used as a tool, but new forms of communication and language are developed. When interpersonal, these new developments become new cultural tools. Vygotsky (2004) describes the process of intrapersonal becoming interpersonal: Creativity is present, in actuality, not only when great historical works are born but also whenever a person imagines, combines, alters, and creates something new, no matter how small a drop in the bucket this new thing

appears compared to the works of geniuses. When we consider the phenomenon of collective creativity, which combines all these drops of individual creativity that frequently are insignificant in themselves, we readily understand what an enormous percentage of what has been created by humanity is a product of the anonymous collective creative work of unknown inventors. (Vygotsky 2004, pp. 10-11.)

The collective work depends on cultural conditions. According to Vygotsky (2004), imagination can produce experiences. We can imagine what we have not seen and conceptualize something that we ourselves have never directly experienced. The historical or social experience allows us to venture far beyond our own experiences and share. Every inventor, even a genius, is also a product of his time and his environment. His creations arise from needs that were created before him and rely on capacities that also exist outside of him. No invention or scientific discovery can occur before the material and psychological conditions necessary for it to occur have appeared. (Vygotsky 2004, p. 17; p. 30.)

The collective cultural creation concerns also children and the best way for children to become culturally productive and participative adults is to be culturally productive as children. Vygotsky (2004) states: The product of creative imagination is an ideal that is only manifest with true and living force when it guides human actions and activities in its drive to be realized or embodied. The shaping of the imagination is reflected in the child's behaviour. Thus the development of imagination is no less important for the future than it is for the present. The development of a creative individual, one who strives for the future, is enabled by creative imagination embodied in the present (Vygotsky 2004, pp. 41-42; pp. 88).

When the child is small, the adult and the child make an original language that would not exist without the other. The ability of the small child to change adult behaviour is substantial. Playing on words, a new kind of humour and the meaning tied directly in the unfolding action enrich both the child's and adults communication. When a child gets used to

producing communication with others, children learn to participate and produce cultural products together with others. As the child's attention is focused on the adult's language, the interpretation merges with meaning. We as educators have to hold ourselves back though. As Amabile (1987, pp. 242-252) states, creative interaction requires a relaxing atmosphere. By stressing hard on teaching children to learn "good" language, the creativity gets harder and our attention is lured away from the process itself.

In a research with kindergarten teacher students (Reunamo & Nurmilaakso, 2007) the model (Figure 3) produced different teaching orientations, which are presented in Figure 4.

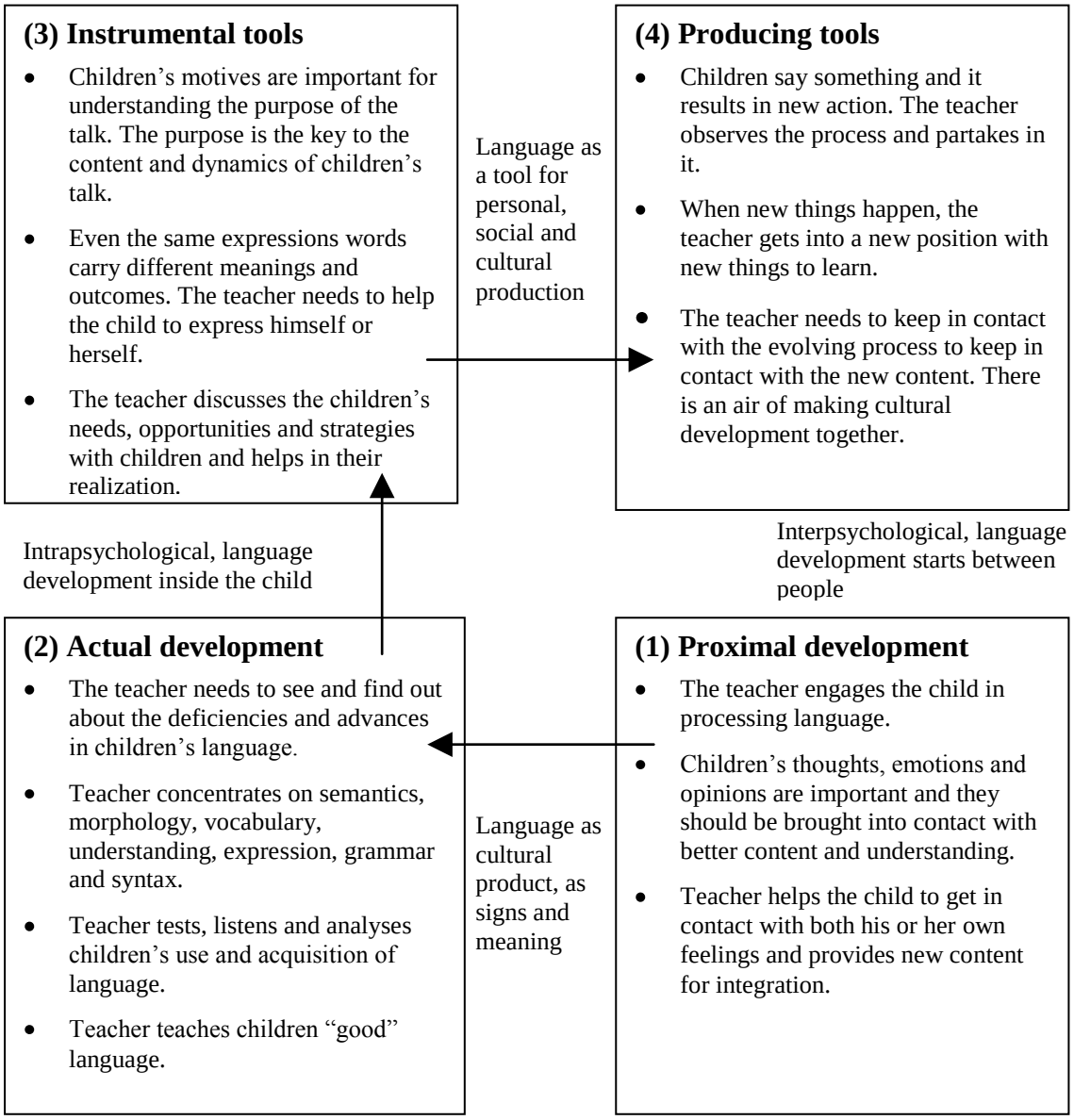


Figure 4. The teacher orientations resulting from the Vygotskian models of language development.

Different views on learning have different consequences for teaching. Different views on child participation produce different roles for teachers. The teacher looking at children's *actual development* is parallel to that of the "traditional" teacher. Looking at children's language as *instrumental tools* seems to be encourage child-centred teaching.

Concentration on *tools production* seems to evoke teaching along the lines of Reggio Emilia. The process can take the form of narration, where every phase is important and not possible without the former. For example the Reggio Emilia style documentation helps teachers to bring forward children's ideas, keep them alive and work on them further together with the child (cf. Gandini & Goldhaber 2001, 124-145). The connection between Vygotsky and Reggio Emilia is clear.

Discussion

In Figure 5 a hierarchic feedback model is presented. The hierarchy of the model is inspired by Hacker (1982), who in fact has a close connection to Vygotsky especially through Leontjev.

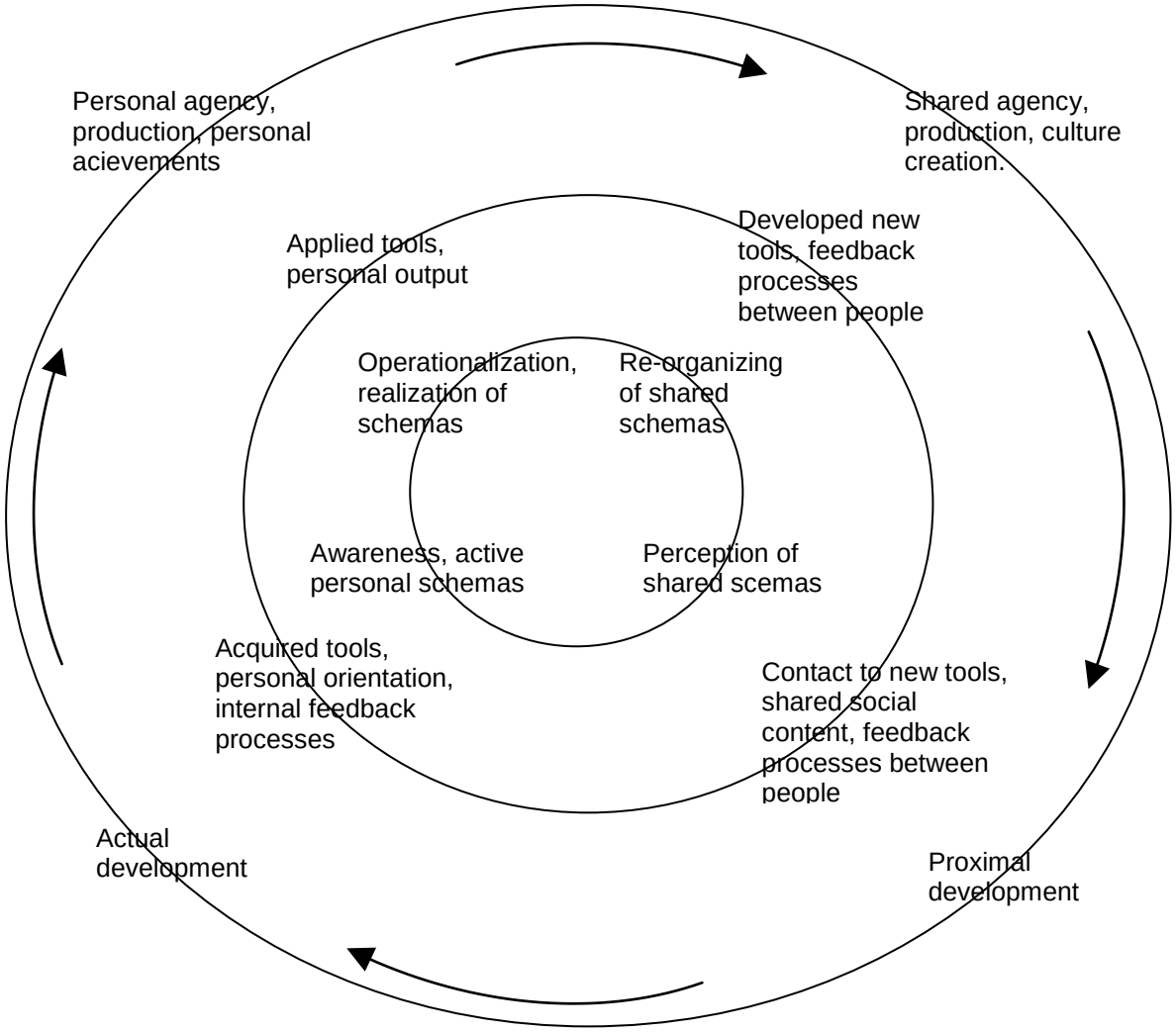


Figure 5. A hierarchical feedback model of Vygotsky's central ideas

The model described in Figure 5 carries a message. Learning is fundamentally a social process. The learning is at first interpersonal at the *zone of proximal development.* By cultural mediation the content is gradually adapted into children's *actual development*. A person works with these adapted (learned) tools and produces personal outcomes and acquires *personal agency*. Further on, this new content can be shared by others and processed further in *shared agency*. Eventually, this shared content can be processed again in the *zone of proximal development*.

The model gives implications for teaching also. As learning is a culturally mediated process, the teacher needs first to find a shared, common understanding, a level of *proximal*

development. Teachers need to know the level of children's *actual development* to help children with their deficiencies. Teachers need to acknowledge children's personal aspirations and content, in order to help children to become the *agents* of their life. Eventually, teachers and children work together producing new cultural content and ways to interact with others (*shared agency).*

Considering hierarchy different aspects of interaction are important. There are three levels of hierarchy in the model.

1) The most basic level of hierarchy is the immediate orientation, sensomotoric orientation: Perception activates personal schemas, which in turn guide concrete operationalization of ideas. Further on, as new results surface, the schemas are re-organized in a shared zone.
2) The second level of hierarchy consists of tools, which are organized algorithms build for performing different tasks: In proximal development children get in contact with new tools. The tools in actual development are the strategies and skills children's have acquired. In personal agency the tools are manifested in the results of utilizing the tools, which in turn may become new ingredients in a shared tool production.
3) The third level of hierarchy is the long-range orientation: In proximal development children orientate into the more advanced processes presented for example by the teacher. In actual development children's abilities for autonomous and metacognitive skills are important. In personal agency, the practice of applying personal skills in different context is important, while in shared agency the skills for cooperative and creative interaction gain in importance.

In the end, all aspects of the feedback loop are important. In the recent discussion the zone of proximal development has been dominant, but the other three phases are equally important. The same is true for the hierarchy; there has been a tendency to emphasize higher mental processes, but the other too levels are equally important. Higher level of intellectual processes can not develop without a tight integration to the basic level of operations of perception, attention, operationalization and shared re-organization of schemas. The contact between higher level orientation and basic operations is required in order to create working and effective tools to work with.

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