

## **Zone of proximal development (ZPD): the hidden dimension?**

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The term zone of proximal development is probably one of the most widely recognized and well-known ideas associated with Vygotsky's scientific legacy. This famous concept is more precise and elaborated than its common reception or interpretation (Chaiklin, 2003, p. 39). It could be viewed in a narrow context, i.e. within the concrete problem of relations between learning and development. But to be completely and *correctly understood* it should be taken in wider context, within the framework of the whole system of Vygotsky's theoretical constructions.

In other words, for better and deeper understanding we should distinguish Vygotsky's original texts the ZPD as a *concept*, the theoretical construct interconnected with other concepts, and ZPD *as definition*, the concrete and particular description of the relations between instruction and development. Neglecting this might lead to misunderstanding of the whole picture. This paper attempts to present the analysis of place of the concept of ZPD in both contexts. It also includes some considerations about the "hidden dimension" of the zone of proximal development in play and learning (as contradiction between meaning and the sense and objectification of sense).

### ***The narrow context and ZPD as definition***

Restoring the concrete context of the definition of ZPD, we should take into account what particular topic was discussed in Vygotsky's text of 1935, where the definition was originally given. The text is a stenographic transcript of his lectures at Leningrad Institutes in 1933, titled "Mental development of children in a process of instruction" (Vygotsky, 1935). What is important is that all the matters discussed in that text were focused on the problem of the relationship between learning (instruction) and the child's development (particularly mental, intellectual development). Criticizing the traditional approach to the problem (supported by J. Piaget and others) that the level of instruction should correspond to the level of development the child has (or efficient instruction is the instruction that corresponds the level of development the child has – which is obvious for many schoolteachers even now), Vygotsky proposes a different approach to the problem.

First, the child development is not a linear process. Simultaneously, there are different levels of development in different functions in the child. At each age there are functions, which are already matured (developed) – they are "fruits" of development; and there are functions that are in a process of maturation – the "buds" or "flowers" of development.

Second, according to Vygotsky, there *are at least* two levels of development of mental functions in child. The first level was called "the actual level of development" which can be detected by the

learning tasks the child can solve individually and independently. The second one (which is also today's level of the child's development) was labelled as "the potential level", detectable by the tasks the child can solve in co-operation with the teacher (or with minimal help), or with the more competent peers. Briefly, at any time the child has two levels of development of his mental, intellectual structures and functions. From this comes logically that there is (and should be) the distance between the levels. Such a distance is ZPD.

The zone of proximal development was defined by Vygotsky 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. (Vygotsky, 1978, p. 86, originally Vygotsky, 1935, p. 42)

This means, particularly, that there are no (and cannot be) such things as "zone of actual development" and "zone of potential development" (common and widespread misinterpretation of ZPD – see, for example, Valsiner, 2000), which in this context does not make any sense. "Proximal" means "close", "near", "aside" – it is the minimal, near at hand distance between two levels of development.

So,

...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. These functions could be termed the "buds" or "flowers" of development rather than the "fruits" of development. The actual developmental level characterises mental development retrospectively, while the zone of proximal development characterises mental development prospectively (Vygotsky, 1978, p.86, originally Vygotsky, 1935, p. 42)

The development of the child's mental functions was described as "actualisation" of the "level of potential development", as a sort of transformation of potential level into actual. What the child can do together (in co-operation with the teacher or other children) today, he will be able to do independently tomorrow.

"Instruction is maximally productive when it occurs at a certain point in the zone of proximal development" ...  
"Instruction is only useful when it moves ahead of development" (Vygotsky, 1935, p. 15-16)

A careful reader can easily notice that both – the definition and the conclusion Vygotsky made - were formulated directly regarding to instruction (particularly school instruction!) and development of child's particular mental (intellectual!) functions, such as thinking, for example. We could even reformulate the definition of ZPD (without losing sense) in such a way:

- "In school instruction we can detect...the distance between the actual developmental level as determined by independent solving of *certain learning tasks*, and the level of potential development as determined through solving of *certain learning tasks* under adult guidance or in collaboration with more capable peers. Such distance is the zone of proximal development of child's mental functions".

We could even reformulate the conclusions (without losing sense) in such a way:

- The level of instruction should correspond to the level of child's mental development, but to be productive, efficient, and developmental, it should correspond to the level of potential development; *it should create* a zone of proximal development of child's mental structures.

But it is also clear, that the development, even mental, intellectual development, to say nothing about development of emotions, memory, volition and so on, occurs not only at school age. This means, that the *definition* of ZPD is not universal, it does not cover the whole process of development, i.e. it is not a concept, it refers exclusively and particularly to school instruction and development of mental structures. It does not mean, of course, that there are no ZPDs (and levels of actual and potential development) in pre-school age, or in adult. The specific “hint” to this we could find in Vygotsky’s words

“Play creates a zone of proximal development of the child. In play the child always behaves beyond his average age, above his daily behavior; in play it is as though he were a head taller than himself. As in the focus of magnifying glass, play contains all developmental tendencies in a condensed form and in itself a major source of development” (Vygotsky, 1966/1933, p. 101).

But the problem is that it is nearly impossible to define ZPD in play on the basis of Vygotsky’s definition referring specially to school instruction. How then *child’s play* creates a zone of proximal development in a situation when there are no defined learning tasks? We could presuppose that there might be a “hidden characteristic” or “hidden aspect” of ZPD, which is not reflected in Vygotsky’s definition, but seems to be rather important for the understanding and discovering of the whole picture. Is there any “hidden dimension” of ZPD in play and learning, and how could it be found?

Experimental investigation and theoretical analysis is obviously the appropriate way to do this. The next part of the article presents a brief outlook of the problem of *development* in wider context from theoretical Vygotskian perspectives.

### ***A wider context and ZPD as a concept***

Discussing this item we should keep in mind that the subject matter of Vygotsky’s psychological theory was not higher mental functions as they were, but the development of higher mental functions. Since ZPD presents one and rather important aspect of development, we need to have an overall picture of how mental development was viewed in Vygotsky’s theoretical constructions.

Here is the “list” of the basic concepts of Vygotsky’s theory, necessary for the analysis of place and role of ZPD:

- The social situation of development (the “point” where development “starts” at every age period);
- The general law of development of higher mental processes (which describes the whole process) and the research method;
- The interaction between the ideal and real forms (the form of child’s development);
- The “new formation” as the result of development

### ***The social situation and the social situation of development***

The social situation of development manifests the initial moment of the process, and it’s starting point at the beginning of each age period.

“...at the beginning of each age period, there develops a completely original, exclusive, single, and unique relation, specific to the given age, between the child and reality, mainly the social reality, that surrounds him. The social situation of development represents the initial moment for all dynamic changes that occur in development during the given period. It determines wholly and complete the forms and the path along which the social becomes individual (Vygotsky, 1984, Vol. 5, p.198,)

First, the social situation of development is the relation between the child and surrounding social reality. Relation (interrelation) presupposes the active position of the child, a certain form of attitude to reality, and interacting with the social surrounding. Second, not every social situation is the social situation of development. What actually makes the given social situation the social situation of development? In other words, what kind of relations between the child and social reality characterise developmental aspect (and potential) of the social situation the child finds himself in? The possible answer is that a given social surrounding brings to the child a certain set of new demands, tasks, and challenges, which are rather new to the child. On the other hand, the child has not enough means and tools to follow the demands and to solve the tasks. We can even say, that there is a sort of conflict, contradiction (dramatic collision) between the child and social settings, which is the contradiction between child’s level of development and the demands of the social surroundings. Dramatic contradiction is the moving force of development. Not in social surrounding itself and its demands, and not in the child itself we could find such force, but in the relations between them, which are dramatic contradictions-collisions. Drama is a key word here.

"The basic principle of the operation of the higher psychological functions (= personality) is a social interaction... They can be accomplished to the full extent in the form of drama" (Vygotsky, 1986, p. 55)

This dramatic collision, mentally and emotionally experiencing contradiction is the form in which the relation between the child and the social surrounding (social situation of development) exists. This is why this relation represents the initial moment for all dynamic changes that occur in development during the given period. This is why such relations determines wholly and complete the forms and the path along which the social becomes individual. Without this specific relation, the social situation is not the social situation of development.

We could ask now, does the dramatically experiencing collision represent that “hidden dimension” of development we are searching for in Vygotsky’s approach? Or maybe we just overestimate and misinterpret the whole story? Anyway we still do not have enough evidences that we are in the right way. Let us then make the next step. Social situation of development defines *the initial moment* of developmental process, whereas *the general genetic law* refers to the process on the whole.

#### *General genetic law of development: the missed link?*

As classical physics is based on Newtonian laws, the theory of Vygotsky is based on the law, called “general genetic law of cultural development”. It seems to be clear that if we do not understand (or if we misunderstand) the general law, we could hardly understand the whole theory, based on this law. Moreover, if we do not understand the general genetic law of cultural development, we might misunderstand the concept of ZPD, which is based completely on the general law (the law of *development* and a *zone of development* are definitely interconnected). We can assume that clear understanding of *general law* might help to find the “hidden dimension” of ZPD.

One could ask why we need such elementary and obvious considerations? The answer is that what we call “the missed link” in the interpretation of the general genetic law is the same what we call “the hidden dimension of ZPD”.

Here is the formulation of the general genetic law of cultural development:

“...any function in the child’s cultural development appears on stage twice, that is, on two planes. It firstly appears on the social plane and then on a psychological plane. Firstly among people as an inter-psychological category and then within the child as an intra-psychological category. This is equally true with regard to voluntary attention, logical memory, the formation of concepts and the development of volition.” (Vygotsky, 1983, p.145.)

It is curious that in literature, the Western readers work with, there are various formulations of this fundamental law.

The first example is from the famous edition of 1978.

“...every function in the child’s...development appears twice: first, on the social level, and later, on the individual level; first between people (interpsychological), and then inside the child (intrapsychological)... (Vygotsky, 1978, p. 57)

This formulation was quoted and repeated so many times that gradually obtained a status of classical formulation for generations of researchers.

The second variant is not yet wide spread, being one of the newest. As J. Valsiner expresses,

“...every function in the cultural development of the child comes onto the stage twice - first in the social relations between people, and then within the person’s intra-psychological self-organisation system. (Valsiner, 2000, p. 40)

At first glance, despite slight differences these two interpretations look more or less similar and correspond to the Vygotsky’s formulation. They both emphasise the most important aspect – social origins of mind, as fundamental in Vygotsky’s approach to human development.

But rather attentive and careful reader can easily see that such kind of interpretations do not help to make clear the “hidden dimension” of ZPD we are trying to reconstruct. If every function appears first in the social relations between people (Valsiner), or on the social level (Cole), and then inside (Cole) or within the child (Valsiner), how ZPD in child’s play can be viewed? Does it mean that the child plays with adult or the other child, and the relations in play (roles in role plays, for example) produce a certain type of mental functions, which move inside the child’s mind, becoming child’s mental functions? Does it mean that in learning and instruction child just co-operates with the teacher or the other child, and the relations in instruction produce a certain type of mental functions, which disappears and then appears again inside the child’s mind, becoming child’s mental functions? No other explanations are possible. But the question remains: how mental functions appear in the social relations, and how they change their location, becoming individual (internalisation can explain the transformation, but cannot explain appearance of the function on the social level, within the relations).

The possible answer might be that there is a “missed link” in Cole’s and Valsiner’s interpretations of the general genetic law. To find the missed link, to understand Vygotsky’s formulation of the law, to identify it’s every word it is needed to know the language the formulation was written on.

Let us try to make a step to such kind of identification.

That is correct, that according to Vygotsky's formulation, every function appears firstly on the social plane, among people. But the crucial point is that the function DOES NOT and cannot appear IN the social relations.

Vygotsky's position is extremely clear:

“...every higher mental function, before becoming internal mental function, previously was a social relation between two people”. “All mental functions are internalized social relations” (Vygotsky, 1983, p.145 -146).

So, before becoming individual function, it was not in a social relation, it was a social relation itself. Social relation is not the “area”, not the field, and not the “level” where mental function appears, - the social relation itself becomes child's individual function – herein lies the answer.

If every higher mental function was a social relation between two people, does it mean that every social relation can become a mental function? Definitely not! Nevertheless, in Vygotsky's formulation we can find clear notion of what type or relation can become a mental function. The point is that to understand it we have to turn to the language of Russian culture of the beginning of 20th century. It makes sense because the formulation we discuss is about the law of cultural development.

It also makes sense because of some personal reasons. We have to recall that having no academic psychological education Vygotsky went to psychology from the area of humanities and culture. He belongs to the generation of “Silver Age of Russian culture”, that was tragically interrupted by Bolsheviks in 1917. Theatre, poetry, arts, literature of that period had a language of their own which was almost totally lost after the Revolution.

In our context I mean particularly the word “category” Vygotsky uses in the formulation. What the word “category” actually means? From the times of Aristotle, especially in German classical philosophy, the category is the most abstract, the most general concept (Spirit and Matter are examples of categories). It sounds strange therefore that the mental function appears twice, first as inter-psychological category, and then as intra-psychological category. Maybe it is just a sort of metaphor, which can be easily omitted in translation?

Not at all! On the contrary, the word “category” (which is repeated twice in the formulation of the general law) has definite meaning. In Russian pre-revolutionary theatre's vocabulary the word category meant “dramatic event, collision of characters on the stage”. Vsevolod Meierhold (famous Russian theatre director) wrote that category is the event, which creates the whole drama (Meierhold, 1920). Sergey Eisenstein, famous film director wrote: “Category is a unit of drama”. Vygotsky was familiar with the language of Russian theater and arts and had to use the word “category” to emphasize the character of the social relation, which become the individual function. The social relation he means is not an ordinary social relation between the two individuals. This is a social relation that it appears as a category, i.e. as emotionally colored and experiencing collision, the contradiction between the two people, the dramatical event, drama between two individuals. Being emotionally and mentally experienced as social drama (on the social plane) it later becomes the individual intra-psychological category.

Probably, the best (and familiar to everybody) example here might be the case of debate between the two people. Imagine (or just remember) that one day you met a friend and had a debate, expressing opposite positions. Dramatical collision in a debate, experienced by the both participants, can lead to a sort of self-reflection. In a course of time, (for example on next morning) one of the participants remembers the event and what he has been done and said. It could happen like «I was wrong saying that, I made a mistake...I should not say such sharp words...I was so

aggressive and did not pay enough attention to what he tried to say...How stupid I was yesterday...” We see here that the individual now experiences the same category intrapsychologically. In this type of internal category all the mental functions of the individual are involved (memory – “I said something rough”, emotions – “How stupid my behaviour was, what a shame”, thinking – “ I have to think it over and never repeat such bad things”, volition – “I must stop it, I will never forget of what I have been done. I promise to myself to be patient...”

Such emotionally experienced collision brings radical changes to the individual’s mind, and therefore it is a sort of act of development of mental functions – the individual becomes different, he becomes higher and above his own behaviour. Without internal drama, an internal category, such kind of mental changes are hardly possible.

This consideration about dramatical character of development, reflected in the word “category” brings the following question: are there any other words and terms in Vygotsky’s formulation, which are also of primary importance?

Yes, there are. The words “on the stage” and “on two planes” are not metaphors, which might be omitted or ignored. Stage in Russian means “scene”, the arena, literally the place in the theatre where actors play. Scene has two planes – the front plane (also called “the first plane”) and the back plane (often called “the second plane<sup>1</sup>”). According to theatre’s traditions, main events of the performance should happen on the front plane of the scene (the same law we could find in visual arts). So, it means that on the stage of our development, the category appears twice – interpsychologically (on the first, front plane) and then intrapsychologically (on the second internal individual plane). Therefore there are no two levels in development, but there are two planes on ONE stage, two dimensions of one event.

We can see now, that our interpretation of Vygotsky's formulation differs from the interpretations of M. Cole and J. Valsiner. The difference is that our explanation explains every word Vygotsky was to use. Scientific formula of the general law of the theory is not a good place for any kind of metaphors. So, it seems to be clear that every word should mean something in the formulation of GENERAL law of the theory. What I tried to do was just to restore the original meanings of the words in order to find the «missed link».

One could ask, nevertheless, why Vygotsky himself did not use the term “dramatical collision”, or just “drama” openly? Probably, such interpretation of the general law is nothing else then a wild fantasy of Nikolai Veresov. Probably he is just attributing to Vygotsky what he actually did not mean. The only trusted evidence, the final and the best evidence must be the evidence of Vygotsky himself.

I completely agree. And here are Vygotsky’s evidences.

#### *Experimental method: unfolding social drama*

It is hardly necessary to explain that in every scientific theory there is a deep connection between the general law and the research experimental method. On one hand, the experiment leads to discovery of the law, on the other hand, the experimental method could be specially designed and arranged to prove the existing and discovered law. The same picture we have in Vygotsky’s psychological theory. In order to find an objective scientific experimental method of study of the development of the higher mental functions, Vygotsky principally rejected the way to study the functions, which are already matured. The functions that are already matured (“flowers of development”) are closed for direct investigation, and this circumstance requires different

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<sup>1</sup> I could compare this with “the role of second plane” in contemporary cinema.

approach. Let us have a look how Vygotsky characterises the famous experimental-genetical method.

The method we use can be named an experimental-genetical method in the sense that it artificially causes and creates genetic process of mental development... The task of the experiment consists in fusing each stiffened and hardened psychological form, to transform it into a moving, current stream of the separate moments replacing each other... The task of such an analysis is to present experimentally of the higher form of behavior not as a thing, but as a process, to take it in movement, going not from the whole to the parts, but from the process to its separate moments "(Vygotsky, 1983, p. 641)

It seems that because of a lot of descriptions in the literature (see, for example, the brilliant description of the genetical-experimental method in contrast to traditional classical one in the Preface to Vygotsky, 1978, written by M. Cole) we do not need any extended comments. But one thing that is of primary importance should be mentioned here.

What actually means – “the task of the experiment consists in fusing each stiffened and hardened psychological form...”? It seems to be clear that it means that in the course of experiment it is necessary to restore the initial, the original form of the function under study. The way is to restore experimentally, in artificial conditions, the original form of higher mental function. In other words, it means to restore the social relation as primary form in which the mental function originally exists. Only in this case, the experiment can artificially cause and create genetic process of mental development, transforming the stiffened form into stem and restoring the movement of the formation of the given mental function.

Everyone who deals with the cultural-historical psychology agrees with this. But there is one aspect, which needs more careful appreciation. It’s amazing, but on the same page and even in the same paragraph where Vygotsky formulates the general genetic law of cultural development, he says how the law is connected with the experimental method.

Let us have a look. So,

From here comes, that one of the central principles of our work is experimental unfolding of higher mental process into the drama, which happened between the people. (Vygotsky, 1983, p.145).

As everybody can see, the requirement to experimental research is the necessity to restore the original form of any mental function, the form of social relation named by Vygotsky clearly and openly – the drama.

What other evidences do we need? Every higher mental function originally exists as inter-psychological category (dramatical social event in the relations of the two people) and after that it appears as intra-psychological category. If the only way of objective analysis of the higher mental function is experimental reconstruction of the history of its development, we have to start from the experimental reconstruction of its original form – the drama between the people.

So, the principle is quite strict and clear. If an experimental study does not unfold the initial form of higher mental function (the dramatical event between two people), it hardly could be identified as genetical experiment, it does not belong to the experimental-genetical method. It seems that we have enough ground for such a strong expression.

This interpretation completely corresponds to Vygotsky’s main task – to create psychology not in the terms of science, but in terms of drama, reconstructing the dramatical process that takes place on the stage of cultural development of the human being.

Summarizing the topics discussed we could say, that at least three Vygotsky's concepts mentioned in our list – the social situation of development, the general law and experimental research method could not be completely understood without taking into account the dimension (labeled by me above as «hidden dimension»), that is dramatical character of development of higher mental functions.

But this is not yet the whole story. How then all these items are related to the concept of zone of proximal development? To find the answer, or just the way of these relations, let us have a look on the rest of the list of concepts we mentioned above. The next in the list is the concept of the interaction of the real and ideal form.

### ***Interaction of real and ideal form: specific feature of human development***

The interaction between the concept of the social situation of development and the general genetic law will be totally incomplete without analysis of the concept of the interaction between real and ideal form. Accordingly, our search of the «hidden dimension» in the zone of proximal development (if there is such a dimension) will remain senseless job.

The first question is how the interaction between real and ideal form is connected with the whole process of development of higher mental functions.

According to Vygotsky,

“...In no one of types of development, which we know, never occurs so that at the moment when there is an initial form, the supreme, ideal form, that should appear at the end of development already exists. The supreme, ideal form directly interacts with first steps made by the child on the way of development of this initial... form. The highest originality of child's development consists in this [interaction], in contrast to other types of development ...” (Vygotsky, 1984, Vol. 4, p. 395).

As V. Zinchenko has to note, “the ideal form can be defined as culture, which the subject finds at the birth... In cultural - historical psychology, development can be characterized as a drama played concerning interaction of real and ideal forms, their transformations and transitions of one in another...” (Zinchenko, 1996, p. 8). In a course of development, individual forms of behaviour of the child interact with the ideal (socio-cultural) forms<sup>2</sup>. This interaction constitutes a sort of “developmental space”, which is the space for acts (events) of development<sup>3</sup>.

From such dimensional view on the problem it becomes clear that transitional, critical periods of child's development are of primary importance since qualitative, dramatical and even radical changes (comparing with the quantitative growth during stable periods) – events of development obviously take place during these periods.

Such a non-linear approach to development shows the limits of classical definition of ZPD. Even more, according to Vygotsky's theoretical model, the result of development is neither the learning task the child is able to solve independently, no child's new mental function. The result of development is characterised by the concept of «new formation».

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<sup>2</sup> More about ideal and real forms in development see El'konin & Zinchenko, 1996.

<sup>3</sup> Excellent philosophical analysis of “the ideal” and the ideal forms has been done in works of E. Ilyenkov (Ilyenkov, 1977). See also Jones, 2001

Traditionally this concept is understood in such a way that at the end of each developmental period the child obtains a new mental function (such as logical memory, abstract thinking or voluntary attention). This common interpretation comes from linear view on development (particularly from ZPD in its narrow sense). But this view is not completely correct.

At first glance it completely corresponds with Vygotsky's approach. There were a lot of places in the works of Vygotsky where everyone could find such kind of references. But the point is that in his last writings Vygotsky himself had to change his own opinion about «new formation».

In the process of development, and in the historical development of behavior in particular, it is not so much the functions, which change (these we mistakenly studied before). Their structure and the system of their development remain the same. What is changed and modified are rather the relationships, the links between the functions. New constellations emerge which were unknown in the preceding stage. (Vygotsky, 1999, p. 92)

Hence, Vygotsky did correct his mistake, proposing a new way of approaching to the whole developmental process. This means that the definition of ZPD does not outline the whole result of development, but only its narrow and particular part. It therefore cannot be taken as the concept, which refers to the whole process of development. Development occurs in multidimensional (social-individual) space. Dramatical collisions in interaction between the real and ideal forms, emotionally experiencing as an actual collision, are the core of the process where the social becomes individual. The concept of ZPD has its place and important role inside the whole system of Vygotsky's theoretical constructions. Therefore, to understand the notion of ZPD correctly means to put it into the context it belongs to. Zone of proximal development as a distance between the level of potential development and the level of actual development really exists ONLY in a case of dramatical social collision between the individuals. This is the dimension, which characterises ZPD at any age period. Such an understanding opens the real perspectives of experimental research of ZPDs not only in school instruction, but also in other directions. With this in mind we undertook our experimental research on the “hidden dimension” of ZPD in play.

### ***ZPD in play: from the hidden dimension to non-linear approach to development***

The focus of our research program we were conducting in Kajaani, Finland was to study experimentally of how child's play creates ZPD from the point of view of dramatical collision and its resolution. In other words, the experimental task was to discover whether the “hidden dimension” of ZPD really exist in child's play. Some of the results of the experimental study were already presented in our publications<sup>4</sup>, but it seems that we could make a next step in interpreting the data we obtained.

The point of departure in the experimental study was Vygotsky's idea of the main developmental contradiction of play.

How does the child [in play]... float from one object to another, from one action to another? This is accomplished by movement in a field of meaning<sup>5</sup> - which subordinates all real objects and actions to itself. Behavior is not bound by the immediate perceptual field. This movement in the field of meaning predominates in play....In other words, the field of meaning appears, but action within it occurs just as in reality. Herein lies the main developmental contradiction of play (1966/1933, p. 101).

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<sup>4</sup> See Veresov, 2000, Veresov & Hakkarainen, 2000, Veresov & Hakkarainen, 2001

<sup>5</sup> In the original Russian text “a field of meaning” is *smyslovoe pole*, which in our opinion could be translated more accurately as “a field of sense”.

The research task was to study experimentally the discrepancy between “the visual field” and the “field of meaning” within child’s play as developmental contradiction, which as we assume constructs a certain “developmental non-linear space”.

The data we obtained did bring some grounds for improvement of Vygotsky’s thought about visual field and the field of meaning in child’s free play.

The following episode (Veresov & Hakkarainen, 2001) seems to be of help.

Episode 1:

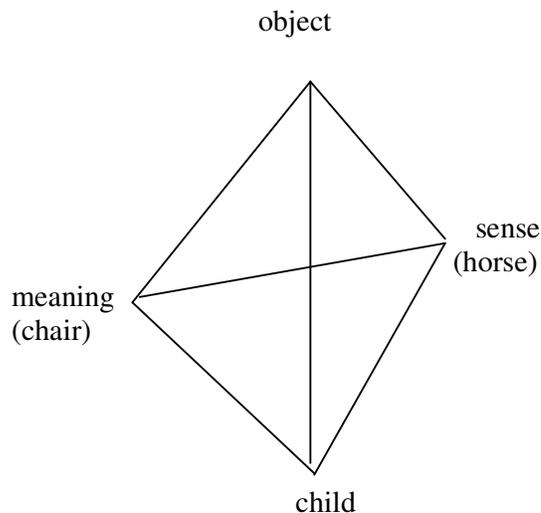
Experimenter: What are you doing?

Child (3 years old boy): Busy...playing

Experimenter: Why are you sitting on the chair?

Child: It’s a horse. I’m racing...

The child acts with an object and understands that the chair is, indeed, a chair. At the same time he approaches the object as if it were a horse. He selects the object on the basis of its suitability to serve as a ‘horse’ or ‘motorbike’. His actions (riding) correspond to the ‘horse’ or ‘bike’ rather than to the stick.



The improvement of the Vygotsky’s original model is that our model introduces sense as a component of play actions. Personal sense is the individual subjective view of a given object, which differs from the physical objective image and meaning of the object.

What is sense in this context? Within the child’s personal perception, and therefore within the context of child’s activity, the stick (physical object field) is, at the same time, a horse (field of personal sense). In play the child approaches the object through the ‘glasses’ of sense.

There is, therefore a kind of contradiction between the field of meaning and the field of sense. Such contradiction becomes observable in the case when the child could not find in the room the object, which can be “a horse” instead of big variety of other objects in front of him. For example, the large bed or a number of big cubes located in the room (the field of meanings) cannot be used as “a horse” because of their physical properties (the size and geometrical form). Such contradiction

might be described in terms of dramatically experienced collision between the play task (the role) and the deficit of tools that can be used.

There are two possible ways to resolve this contradiction. The child could deny the play or change the intention. (“ I am going to race...where is my horse? Not here...it went to bed). On the other hand, the child could try to find or to select the object that could “work” as a “horse” or a motorbike, which could be used as a “horse” or a motorbike in play. In this case, the child objectifies sense; sense finds its object.

The objectification of sense, the movement from the field of sense to the field of meanings is the way to resolve the contradiction the child faces and experiences.

Let us have a look on this from the perspective of zone of proximal development in play. There are two aspects of ZPD in play. First, the play situation includes initial contradiction between the play task and the objects that might be used in play (contradiction between the field of sense and the field of meanings). It might be described as dramatically experienced collision between the play task (the role) and the deficit of tools that can be used.

It should be stressed that such contradiction exists (in hidden internalized form) even if there are a lot of suitable objects the child can use in play. It is actually what we called “the hidden dimension” of ZPD. We can make it observable and approachable for analysis only by using Vygotsky’s genetical experimental method. In this paper we already discussed Vygotsky’s approach to experimental method. Creating a specially designed situation where there are no suitable objects the child can use as “a horse” or a “motorbike” we just follow completely Vygotsky’s requirement, which is “the experimental unfolding of the process into the drama”.

The second aspect of ZPD in play is what we defined as the objectification of sense as a type of resolution of the initial contradiction. So, play situation should contain the possibilities to resolve the contradiction. In ordinary everyday situations where there are a lot of appropriate objects in front of child he can use as “horses”, the objectification of sense remains hidden from direct observation. But in a specially designed situation where there are only a few suitable objects the child can use as “a horse” or a “motorbike” we can see the process in its open and observable form.

So, we think that the experimental data we obtain gives some grounds for the assertion, that ZPD in play characterizes by two aspects – the initial contradiction between the field of sense and the field of meaning, and the objectification of sense.

This conclusion (which is yet preliminary) improves Vygotsky’s idea of the child’s action in a field of sense as the main developmental contradiction of play, and, on the other hand, brings some proof for our non-linear understanding of the place and the role of ZPD, presented in the first part of this article. ZPD might exist even in a case when there are no definite learning tasks. The concept of ZPD which was defined by Vygotsky for the situation of school instruction, must be defined for the situation of play as child’ leading activity in pre-school age. We hope that the results we obtained might open some perspectives for that. The last part of this article is an attempt to apply our findings to learning process and ZPD in instruction.

### ***ZPD and learning in play***

The aim of mental imaginary experiment presented here is to present in clear and simplified form the difficulties the teacher can meet in detecting ZPD of the child at pre-school age. It also shows the practical importance of the “hidden dimension” of ZPD in play and learning discussed in the theoretical part of this article.

The following imaginary situation sheds light on this question:

Teacher: Suppose you have two apples. Then you give one apple to someone. How many apples will you have?

Child: Two apples.

Strictly following the traditional definition of ZPD teacher might consider that the mathematical solution (number of apples left) signifies the level of potential development of the child. The correct solution is only attainable in co-operation with an adult or more competent peer. It seems that the task creates a perspective for the development of the child. But taken from the perspective the initial contradiction between the field of sense and the field of meaning, and the objectification of sense, the situation described is not contained within the zone of proximal development.

Let us ask - does the child learn in play or within play? Definitely, yes! For example, playing with the stick the child learns about the object and its objective physical properties. But what is important here is that he also learns about, or rather examines, these properties to the extent to which they allow the stick to become (or prevent it from becoming) a horse. The object is included into the child's field of sense; if the object does not suit the play task the child will simply stop playing with it. Learning in play, therefore, is a movement from the field of sense to a 'field of meaning'. In other words, sense finds a suitable object, that is, sense objectifies itself.

It is quite easy to uncover this "sense-meaning" dimension within the given task.

Teacher: Suppose you have two apples. Then you give one apple to someone. How many apples will you have?

Child: Two apples.

Teacher: How come?

Child: I never give my apples to anyone.

What we have here is a situation in which the child approaches the task through the 'glasses' of his personal sense, that is, his personal attitude towards the situation. What the child in fact does is to introduce precisely personal sense into the task (I never give my apples to anyone), and this leads to the wrong mathematical answer. The does not give the right answer not because of any contradiction between the level of the child and that of the given task. On the contrary, it is a consequence of an absence of the field of sense within the task. The child gives the answer solving the initial contradiction between the field of sense and the field of meaning, and objectifies the sense. And the child is able to do it independently. From this perspective there is no "hidden dimension" of ZPD neither within the task the teacher proposes to the child, no in the child's approach to the task. The task is not contained within the zone of proximal development.

Moreover, the task itself does not signify the level of potential development of the child. Let us change the situation.

Teacher: Somebody has two apples. Then he gives one to you. How many apples will he have after that?

Child: One apple!

Teacher: Why?

Child: I will have one apple and he will have only one.

Did we in fact change the task? Not at all! In terms of mathematical calculation ( $2 - 1 = 1$ ) the task is identical. The child, however, is now able to solve the task independently. The task, therefore, is not contained in a zone of proximal development, but reflects the actual development of the child. This means that the teacher's consideration based on the definition of ZPD is not completely correct.

This imaginary and easy-to-follow situation was specially designed in order to make clear the importance of the "hidden dimension" of ZPD in learning within play at pre-school age. We agree that in real life situations the tasks are different and much more difficult to observe. Our simplified example was just to show in a clear form that if a child is not able to solve a given learning task independently and when he is able to solve it in co-operation IT DOES NOT ALWAYS MEAN that the task is contained within his zone of proximal development.

### ***Concluding comments***

The concept of zone of proximal development could be viewed in a narrow context, i.e. within the concrete problem of relations between learning and development. But what is needed is a sort of generative understanding of the theoretical approach, which is more valuable than a simple definition of the concept. ZPD might be better understood being taken in wider context, within the framework of the whole system of Vygotsky's theoretical constructions. We need to understand what Vygotsky meant by development in general, if we are going to understand what he meant by zone of proximal development.

The theoretical framework of our analysis, including such concepts as the general genetic law of development, social situation of development, the interaction between real and ideal form allows to come to conclusion that the definition of ZPD might be improved. Dramatical and contradictory character of interaction of the real and ideal forms constitutes a "hidden dimension" of ZPD not only in learning settings. This, in turn, allows to make a step from linear to non-linear approach to development. Research strategies in education and developmental psychology obtain new possibilities from describing mental development as a process to the analysis of "acts of development" in terms of drama, that in some sense reanimates original Vygotsky's approach.

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