Vygotsky's Non-Classical Psychology of Language within the Metatheories of Holographic Movement and Synpatogenesis: Playing with a New Reality

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Thirty Spokes Share the Wheel's Hub, But, it is the hole in the center that provides its usefulness. (Lao Tsu)

Introduction

We will begin with two hypotheses: #1: Language theories are at the very core of Vygotskian thought, and it is precisely this area that is one of the most neglected aspects in Vygotskian research. #2: Regarding language theories, we are in a post-Chomskyan era, and a pre-Vygotskian era. This new era must include Vygotskian language theories, as well as non-classical psychology. Daniel Elkonin (1989) coined this term by stating that non-classical psychology is "the science of the way the subjective world of a single person emerges from the objective world of art, the world of the production of tools, the world of the entire industry"(Elkonin, p. 478). It is claimed that Vygotsky's thinking is so new today that we have not even comprehended the surface to date. V. Sobkin & D. Leontiev (1992) stated the following:

Vygotsky moved toward a new psychology…Perhaps it is the science of the human mind for the next century [21st]…The more time has passed since Vygotsky's death, the more we see him ahead of us, lighting our path. (192)

The perspective taken here is that Vygotsky worked within various traditions, wanting to establish a new, scientific psychology. The understanding of the word "scientific"within psychology often equates with the word "cognitivism,"and the problems involved in such a comparison will be discussed. As well, there will be a short historical view of physics [as a natural science], also describing holonomy, or the holographic Model (Bohm/Pribram). This model is only intended as an overarching metaphor, to place a wedge between various approaches within cognitivism and extremely advanced theories in physics, which include the paranormal (something usually avoided in classical psychology). Vygotsky wanted to "bring out"subjective features so that they could be analyzed, connecting them with objective features. His non-classical psychology is based within Spinozian monism and Marxian philosophy, also using the dialectical method. This method is based upon certain principles, such as the law of general genetic development, the genetic-developmental method, the law of concept equivalence, etc. Clearly, metaphor is what combines subjective and objective features, allowing us to form new, overall images of how we want to establish our own Vygotskian approach. There will be a short discussion of the brain, related to the synapses, or better the space between the synapses, which can be understood as the trigger or the firing potential of our thought processes. It is precisely the "space"between the synapses, the "hole,"which can be comprehended as the starting point of development in thought, with "motive,"inter alia, representing the trigger mechanism. And, since it is extremely important to refocus on language theories, there will be a metaphorical game of viewing language/consciousness-personality/mediation within a very new approach. It places the individual in a totally new, paradoxical position in the world. The paper will close with a famous quote offered by Vygotsky, which will hopefully be viewed in a different light. The following idea represents a key idea in understanding the purpose of this paper: "Vygotsky treated human psychology not as a natural science but rather as a synthetic [synthesis, D.R.] science, integrating natural, humanitarian, and social knowledge."(Sobkin & Leontiev in Cupchik and Lazlo [Eds.], 1992, 192)

Metaphor and Science

All language is metaphor, and much of science is also metaphor. However, there is often a knee-jerk reaction in the West when these two areas are mentioned together. "The fear of metaphor and rhetoric in the empiricist tradition is a fear of subjectivism---a fear of emotion and the imagination"(Lakoff, 2003, 191).

What happens in both realms revolves around our core perceptions and how we interpret them, and perceptions are closely (not always) linked to language. For example, R. Innis (1982, 38) stated that "Bühler's thesis [is] that language potentiates the operations of perception""…the theory of perception in psychology cannot be brought to anything without considering the sign-functions of the sense-data in

it."(Bühler in Innis, 1982, 5). Although perception is not the topic of discussion in this paper1 , it is clearly a core aspect to think about when reshaping our views of Vygotsky. For our purposes, it is assumed that many people still operate within unquestioned philosophical foundationalism today, where prescribed and accepted theory still reign true, such as Chomsky's linguistics. At the same time, we know how to live in the postmodernist world of "anything goes."The Vygotskian perspective transcends both of these planes, allowing us a new sense of freedom. The actual goal we are striving for is "free will of action,"or an "inner freedom"to reconstruct our inner selves and our environment. At the same time, this understanding is tied to Spinozia's understanding of what Yaroshevsky calls "social determinism."Andy Blunden has called it the zone of fusion. However, we are getting ahead of our story. Let's return to a short review of the history of cognitivism and physics, to avoid some interpretative problems in the future.

Cognitivism

Vygotsky has been called a "cognitivist"or "cognitive"psychologist by some in the West and in Russia. This is a very dangerous position to take, and it is a wrong position for many reasons. Cognitivism began during the 1950s, offering an alternative to behaviorism. During that period the word "innate"was an attempt to reclaim the inherent qualities each individual possesses. And, politically in the United States, during the 1960s, there was a focus on social equality. However, it left a sense of dualism or a split within real life, just like the Cartesian mind/body division. Chomsky, for example, is known for his extremely conservative linguistics and extremely liberal politics. The initial idea of cognitivism was to place "meaning"back into theory. Jerome Bruner (1990), one of the founders of cognitivism, explains it this way:

I want to begin with Cognitive Revolution as my point of departure…For, at least in my view, that revolution has now been diverted into issues that are marginal to the impulse that brought it into being…Now let me tell you first what I and my friends thought the revolution was about back there in the late 1950s. It was, we thought, an all-out effort to establish meaning as the central concept of psychology—not stimuli and responses, but meaning…Very early on…emphasis began shifting from "meaning"to "information,"from the construction of meaning to the processing of meaning…Very soon, computing became the model of the mind, and in place of the concept of meaning there emerged the concept of computability. (1-6)

Interestingly, brains are not designed like computers2 (see Deacon, 1997), and symbolic real world realities cannot be reproduced in a computer today; and it is precisely the symbolic process that we want to better understand, and perhaps even transcend.

Cognitivism led to the fact that the "human agent"does not even need to be present, and when a person is referred to, everything is calculated within the individual's mind/brain/consciousness, which has led to a dead-end often resulting in solipsism and fragmentation. Within cognitivism the human existence seems to be understood as the sum of our parts, which can only lead to fragmentation. David Bohm (1980) has stated this problem succinctly: "…in the first instance, fragmentation is an attempt to extend the analysis of the world into separate parts beyond the domain in which to do this appropriately…it is in effect an attempt to divide what is really indivisible. In the next step, such an attempt will lead us also to try to unite what is not really unitable"(Bohm, 15-16).

Another important point is that cognitivism is often not scientific, but deductive. Within Chomsky's model, there is an attempt to state that there are universal grammar rules, located somewhere in the "deep"structure, but there is no explanation of how the rules reach the "surface"structure, and no explanation of the "deep"structure. There is a top-down, deductive approach, functioning outside a real-life continuum. And, in 1966, Chomsky tried to warn second language researchers to not use his method for understanding the teaching of foreign languages, but to no avail.

To state the cognitivist problem simply, F. Varela (1997) maintains that:

(1) cognitivism postulates mental or cognitive processes of which we are not only unaware but of which we cannot be aware, and (2) cognitivism is thereby led to embrace the idea that the self or cognizing subject is fundamentally fragmented or ununified…Cognitivism….postulates processes that are mental but that cannot be brought to consciousness at all. Thus, we are simply unaware of the rules that govern the generation of mental images or of the rules that govern visual processing. (48-49)

Today, we are entering a post-Chomskyan era, and it is clear from research that such a unified theory cannot explain grammatical facts for all languages. Most of all, it is interesting to witness the monolithic status Chomskyan linguistics has maintained for over 50 years, in a pluralistic society in North America.

This situation is clearly changing today, with new challenges to a rationalism which convinced many for so long that it was scientific. In fact, today "there is no clear distinction between the 'core' and the 'periphery' of a language, and this undermines the whole idea of The Grammar of a language as a clearly defined set of rules…The breakdown of the distinction between 'core' and linguistic 'periphery' is a genuine scientific discovery…"(Tomasello, 2003, 5, 10). Cognitivism has gone so far as to presume that cognition can proceed without consciousness (see Varela, 1997, 51); and, as reflected through Chomsky, cognitivism operates outside of everyday life, standing on the principles of Cartesian division, although it appears to offer unity and wholeness.

The Greet poet Archilocus stated: The fox knows many things, but the hedgehog knows one big thing. "If we consider our own field, it seems to us that Chomsky is an innate hedgehog with a hedgehog's longings."(Moore & Carling, 1987, p. 26)

In closing this introduction, it should be mentioned that two other areas have had tremendous influence in psychology, namely constructivism3, and connectionism. Briefly, constructivists are opposed to the understanding of innate knowledge. "A major tenet of constructivism is the idea that the wiring of cognition in the neocortex can be achieved on the basis of extrinsic inputs—that neocortical circuits can be constructed by extracting structure from the sensory environment"(LeDoux, 2002, 88)4. The last point regards connectionism. To keep this short, J. Elman et al (2001) offer a definition:

There is considerable diversity among connectionist models, but all models are built up of the same basic components…The processing elements are usually called nodes or units, and are likened to simple artificial neurons…Throughout we have stressed that we are not anti-nativist, but that we deem it essential to specify at precisely what level we are talking when we use terms like "innate."(50, 391)

Some of the background ideas and paradoxes of cognitivism are: (1). Cognitivism was a reaction to behaviorism and the political climate of the 1950s. Innatism also represented the equality of all people, reflected in the North American politics of President Johnson during the 1960s. (2). Cognitivism deems itself scientific, without any explanation of how the "rules"are generated, emerging from the linguistic "deep structure."There is no real time processing in most cognitivist thinking. Some areas of cognitivism

include innatism, some branches don't. (3). The fragmentation within cognitivism which unfolded was also reflected in the emergence of postmodernist thought.

Physics

In slowly approaching the unity and wholeness of Vygotsky's thinking, we will start with an overview of physics, which, as a natural science, has developed into worldviews that are radically different from cognitivism. Classical physics, of course, dealt with causal laws within a time and space conceived linearly. Relativity theories completely transformed our thinking about the role of the observer/observed, and time and space. Quantum theories went further, with Bohm's ideas of indeterminancy approaching a lawlessness in the universe, together with Heisenberg's uncertainty principle, inter alia. Quantum physics has certainly offered us a new world view: (1). Indivisibility of the Quantum of Action, (2). Wave-Particle Duality of the Properties of Matter, (3). Properties of Matter as Statistically Revealed Potentialities, (4). Non-Causal Correlations (cf. Bohm, 1980, 128-129).

The next movement in physics to be discussed will be holonomy, and it has been researched since the late 1940s:

Holonomy does not totally deny the relevance of analysis… "the law of the whole will generally include the possibility of describing the "loosening"of aspects from each other, so that they be relatively autonomous in limited contexts….However, any form of relative autonomy (and heteronomy) is ultimately limited by holonomy, so that in a broad enough context forms are seen to be merely aspects…in the holomovement, rather than disjoint and separately existent things in interaction. (Bohm, 1980, 157)

Within all holographic theories there is the understanding that the whole image of a structure is replicated within its parts, and it is therefore possible to see images of the whole within a single part.

The holographic nature of phenomena goes beyond metaphor, metatheory, and metapsychology, extending into a totally new understanding of the direct connections between the absolute/relative, monism/dialectic, and internalization/externalization, among other examples. This model includes phenomena that literally cannot be explained by today's science. For example, there is a teenage girl living in Rotterdam, who has suffered Rasmussen [encephalitis] syndrome, having her entire left brain hemisphere removed a few years ago. Normally such children cannot speak, and although she does not have complete control of the right side of her body, and has limited vision, she is living a normal life. What is most interesting is that she can speak in two languages perfectly well, Turkish and Dutch. This should be impossible since the language center was removed (cf. Der Spiegel, 21, 2002). We also have the example of blind and deaf people writing and communicating in a very rich and prolific context, such as Helen Keller and many others. As well, there are tens of thousands of examples of people from all over the world within naturally altered states of mind, who can endure all types of torture and pain (cf. Talbot 1991), without any trace of injury. These examples (called psychokinesis) raise the question as to how a holographic mode of reality can occur, and how we can access such a reality in everyday living, when science cannot explain these phenomena, and usually ignores them. How do our brains understand the distributing process, and what type of new framework must be discovered to penetrate the deeper understanding of holographic theory in psychology, neurolinguistics, and psycholinguistics? In going a step further, regarding physical existence in general, we now know that an electron can manifest as either as a particle or a wave, but most of us don't know that physicists have discovered that an electron literally possesses no dimension (cf.Talbot, 1991, 33). David Bohm (1980) is radical in making various assumptions about our universe, and he feels that there is an implicate ("enfolded") order at work at a much deeper, invisible level. There is also an explicate ("unfolded") order in place for our normal understanding of reality, which he considers to be an illusion, one we can transform at will, if we could better understand the principles of holography.

It was Dennis Gabor who first spoke of "holography"and the "hologram"during the late 1940s, defining a hologram as a photographic record, containing all of the information to reconstruct the whole image (Pribram, 1971, 147).

Gabor holograms can be composed in two ways. A wave form is divided by a beam splitter (e.g., a half-silvered mirror) so that one part serves as a reference, the other is reflected off the object to be photographed . . . The reference alone can then be used to reconstruct an image. Or each part of the divided beam can be reflected off a different object. (Pribram, 1971, 147)

A hologram is produced when a single laser light is split into two separate beams. The first beam is bounced off the object to be photographed . . . Then the second beam is allowed to collide with the reflected light of the first, and the resulting interference pattern is recorded on film. (Talbot, 1991, 15)

Within a holographic image, the entire original picture is somehow distributed throughout the parts with the complete image being encoded, so that the whole can be reproduced throughout the part. At the same time, Bohm views the world as a "holomovement,"not a static image, believing in the undivided wholeness of everything. This holomovement is non-linear and serves as a background field.

There is also a pattern to understanding holography. Karl Pribram, for example, does not believe that the distribution of the holographic model is simply "free flowing,"just as he does not believe that memory is "…distributed helter skelter all over the brain"(Pribram, 1971, 165). Pribram does believe that there is a holographic informational representation that is distributed throughout all neural patterns, just as this distribution is found in holographic photographic records. He states that:

According to the holographic hypothesis, the mechanism of these correlations is not by way of some disembodied "floating field"nor even by disembodied wave forms. Instead, consider once again the construction of more or less temporary organizations of cortical columns (or, in other neural locations, other aggregates of cell assemblies) by the arrival of impulses at neuronal junctions which activates horizontal cell inhibitory interactions…A neural holographic or similar process does not mean, of course, that input information is distributed willy-nilly over the entire depth and surface of the brain. Only those limited regions where reasonably stable junctional designs are initiated by the input participate in the distribution. (Pribram, 1971, 152-157)5

The last point in this discussion will be the work of N. Bernstein in Moscow in the 1930s. Bernstein observed subjects wearing black body tights, with white dots on their joints and various parts of their body. The subjects would move, dance, and Bernstein was actually able to predict the next movements using the principles of Fourier trigonometry. He spoke of the importance of an Image-of-Achievement being activated in movement.

Bernstein's analysis was made from cinematographic records or performances such as walking, running, hammering, filing or typing. Human subjects were dressed in black costumes outfitted with white dots

to mark the various joints of the limbs…The film strips would…be composed of continuous patterns who's wave form could be analyzed mathematically. (Pribram, 1971, 244)

It should also be mentioned that Karl Pribram worked and published with A. R. Luria, and came to Moscow various times. In closing, what is important to understand is that a new reality is being presented, perhaps that of Spinoza's "intuition."There are two very important points: (1). Perhaps we are viewing our world and realities through the perception of "interference"patterns. In 1979, Russell and Karen DeValois "…converted simple plaid and checkerboard patterns into Fourier waves and discovered that the brain cells of cats and monkeys responded not to the patterns themselves but to the interference patterns of their component waves"(McTaggart, 2002, 86). (2). One evening, Pribram and Gabor used Beaujolais wine to cover three napkins with complicated Fourier equations, to see how the brain might manage the response to wave-interference patterns, converting them the information to images. "There were numerous fine points to be worked out in the laboratory; the theory wasn't complete. But they were convinced of one thing: perception occurred as a result of a complex reading and transforming of information at a different level of reality"(McTaggart, 2002, 83). Various physicists have suggested that not only our brains/mind and vision function holographically, but that our planet, universe, cosmos is also a hologram.

Consciousness, New Symbolic Order/Hologram--Paradoxes

Although we know that the earth revolves around the sun, we often believe that the world revolves around each individual, meaning that we still believe that we are the center of the universe, or the universe is basically inside ourselves. The position taken here is to place the individual within the background of the social context, perhaps later within the universe and cosmos. And, although it might appear that the individual is now viewed as a static entity, nothing could be further from the truth. To understand the ideas that follow, we need to attempt to step outside of our culturally programmed frame of reference and metaphorically put on 3-D glasses to view a new reality, one that cannot totally be described in our dimension of existence. These views are often dismissed by scientists and psychologists alike, to only discuss that which can actually be felt, heard, or seen. These thoughts will lead to a newer interpretation of Vygotsky's thoughts on language. To foreshadow the rest of the paper, the overall goal we are dealing with at the core of Vygotsky's thinking within his language theories is "free action of will."In fact, the concept of "will"is at the heart of his overall method. In the West, we might interpret this to mean "freedom to move in any direction we desire."However, In Vygotskian

thinking, this "free action of will"is completely connected to Spinoza's understanding of an inner freedom, tied to monism, social determinism, and philosophical necessity. This is the ultimate paradox that each of us must deal with in our own lives. To begin shifting our views, we will look at some quotes:

(1). "…it may not be the brain that produces consciousness…but, rather consciousness that creates the appearance of the brain"(K. Floyd inWilber, 1982, 24).

(2). "Let us be clear. The thinker, not consciousness, is death-bound"(Weber in Wilber, 1982, 37).

(3). "There is a material basis for the mind as a set of relations"(Edelman, 2000), 219).

(4). "…the 'ideal and the 'material' cannot and must not be regarded as opposites. Here they are 'different,' and that is all"(Ilyenkov, 1977, 11).

(5). "If matter and consciousness could in this way be understood together, in terms of the same general notion of order the way would be opened to comprehending their relationship on the basis of some common ground. Thus we could come to the germ of a new notion of unbroken wholeness"(Bohm, 1980, 197).

(6). "We don't design languages at all. It 'designs' itself…In short, we failed to notice that a flurry of adaptation has been going on outside the brain"(Deacon, 1997, 109).

(7). "But there is another alternative [to Chomsky]: that the extra support for language learning is vested neither in the brain of the child, nor in the brains of parents or teachers, but outside brains, in language itself"(Deacon, 1997, 105).

At this stage, we have entered a new dimension, and the only way it can be explained is by metaphor, as we cannot step outside of our own consciousness to have an objective view of reality. Researchers are now telling us that most of our brain systems are indeed of a plastic nature, working outside of our consciousness (cf. Le Doux, 2002, 28), and that "no single area of the brain is responsible for conscious experience"(Edelman, 2000, 51). There are many fascinating stories describing how the brain compensates for loss, and since we share the same DNA with flat worms, fruit flies, rats, monkeys, etc., experiments tell us something about ourselves. During the 1960s, Paul Pietsch experimented on the brains of over 700 salamanders, watching their feeding habits. He wanted to dispel the myth of the hologram. He would remove the brains to return them in different positions, even rotating them, and he went so far as to mince the brains, to return them to the proper owner, to discover that each and every time the salamanders remembered how to get to their food source.

When viewing the hologram and the holomovement (understood to be a field) as a possible partial understanding for what happens in our reality, we also need to comprehend that "essentially, the theory reads that the brain at one stage of processing performs its analyses in the frequency domain. This is accomplished at the junctions between neurons and not within neurons"(Pribram in Wilber, 1982, 32). This process is called synaptogenesis or the creation of new synapses between the existing neurons, a process that probably continues until the moment of death. It is the space or Taoist hole between the synapses where creativity is born, and because of the dance of the projection neurons, interneurons, etc., a circuit/system creating human functions is formed. Previously, it was mentioned how a hologram is constructed, with a single laser light split into two separate beams, where the first beam is bounced off the object to be photographed, with the second beam colliding with the reflected light of the first, resulting in an interference pattern being recorded (cf. Talbot, 1991, 15). Again, when trying to view a hologram with our current sense of reality we will only see interference, and to some degree it is hypothesized that this interference is our 3 dimensional reality, perhaps representing our subconscious, working together with our consciousness.

There is no one-to-one correspondence between the holographic image and reality, as perceived by the eyes. The hologram of a flower, no matter how lovely, will appear as a tangle of interfering wave fronts, because reality is presented to us in a different order. What happens between the retina of the eye and the visual cortex in the brain is similar to this process. (Bentov in Wilber, 1982, 136)

In order to see the hologram, there needs to be another laser beam (or sometimes a bright light source) that shines through the film, and a three-dimensional image will appear. A person can walk around holographic objects, viewing them as if they were almost real. However, like an electron, the hologram occupies no space, and a person can simply put her hand through the image. As well, there is always a hologram within a hologram, with no end, realizing that all aspects of the hologram cannot be viewed when becoming smaller and smaller. Now, it is hypothesized that memory is processed by the brain holographically, as well as vision. "... Pribram revealed that as much as 98 percent of a cat's optic nerves can be severed without seriously impairing its ability to perform complex visual tasks"(Talbot, 1992, 18-19).

Key elements in understanding holonomy, for the purposes here, relate to another reality available to us, the Implicate Order. To understand this new order, it is virtually impossible to experience it in the realm of the physical senses. It is an intuition, focusing on constant movement and constant distribution. It is

non-linear, has no real space-time dimension, and regarding the hologram, there must be a new vision in place to comprehend this new reality. David Bohm calls it the undivided wholeness in flowing movement.

A Metaphorical View of Vygotsky on Language6

Indeed, Vygotsky approached psychology from the point of view of unity, synthesis, and transformation. However, it would be dangerous to simply attempt to label him as a cognitivist, Marxist, defectologist, psychologist, etc. It is a new view of unity that Vygotsky was proposing, and the hologram is only one way of viewing Vygotskian reality.

In establishing transitional theories and methodologies, leading to new non-classical sciences, "we must reveal the essence of the given area of phenomena, the laws of their change, their qualitative and quantitative characteristics, their causality, we must create categories and concepts appropriate to it, in short, we must create our own Das Kapital"(Vygotsky 1997, p. 330). It is at this stage that a reminder should be offered regarding Vygotsky's relationship to Marxism. He did not attempt to overuse the word Marxism, stating that it would be up to others to evaluate whether a real Marxist psychology would be established. He also did not believe in extrapolating tenets of dialectical materialism onto a Marxist psychology, although historical materialism was a basic cornerstone of his approach. At the same time, Vygotsky referred to this new general psychology as Dialectical Psychology (Vygotsky, 1997, p 112). Vygotsky's approach of unity, regarding subjective and objective phenomena, was also related to concrete practice and to the degree of the "scale"of measurement that could be implemented. He felt that often within philosophy, the scale of measurement was too large, and sometimes within the natural sciences, the scale was too small. He gave the example of measuring the height of a man in miles instead of with a tape measure. The basic question of measurement revolves around the dichotomy of being and appearance, since a direct correlation of these phenomena would then supersede the need for a new, non-classical scientific approach in the first place. In other words, if the appearance of situations, reactions, objects, and so on, could be paralleled to the actual "being"or to reality as such, then there would be no need for philosophy, physics, or any science. And, because there is not a direct correspondence of being and appearance, then observation, sensation, and perception must offer a multiplicity of interpretations, with humans attaching different meanings to the memory and image of past phenomena in relational and varying ways. This freedom of perception allows for growth, but also for possible fossilization, and it is a simple reason why natural science is not completely objective or absolute.

Vygotsky would often comment on various philosophical positions, and offer a new orientation to the basic premises by restructuring the core of the initial questions of that philosophy. In order to complete such a task, it was important to separate analytical problems from ontological ones, focusing on a synthetic unity that was initially placed within an intuition of essences, hence metatheory, with a proper measuring scale in place to measure both subjective and objective processes. But, how can such a metatheory actually be used, since we cannot objectify subjectivity? For example, how can we understand the essence of the heat of the sun, when divorcing it from the sun itself? Or, on another level, how can we understand the harmony and intentions of a dancer who is performing, when separating the physical movements from the intentions and expressions of the soul and joy of the dancer? It is precisely at this juncture that Vygotsky offers a very interesting metaphor, which transcends both the problems of introspectionism and behaviorism, inter alia. At the same time, this metaphor and metatheory, applied to psychology and philosophy, must be understood within the Marxist and Spinozist conception of a science, focused on a monistic framework that is embedded within the flexibility of the dialectical approach, which is also connected to a process vs. product relationship. It is at this point that a direct metatheoretical method will be described that can be used to actually create certain aspects of a new non-classical psychology, and the measuring scale that will be used is a dialectical instrument, which is anchored in materialism and Spinoza's monism. "After all, our task is not at all to isolate our work from the general psychological work of the past, but to unite our work with all the scientific achievements of psychology into one whole, and on a new basis"(Vygotsky, 1997, p. 342).

Metaphorical Representation of a Mirror Reflection used as a Dialectical Method

Since this particular method is not often quoted, Vygotsky's entire summary will be offered:

Let us compare consciousness, as is often done, with a mirror image. Let the object A be reflected in the mirror as a. Naturally, it would be false to say that a in itself is as real as A. It is real in another way. A table and its reflection in the mirror are not equally real, but real in a different way. The reflection as reflection, as an image of the table, as a second table in the mirror is not real, it is a phantom. But the reflection of the table as the refraction of light beams on the mirror surface—isn't that a thing which is equally material and real as the table? Everything else would be a miracle. Then we might say: there exist things (a table) and their phantoms (the reflection). But only things exist—(the table) and the reflection of light upon the surface. The phantoms are just apparent relations between the things. That is why no science of mirror phantoms is possible. But this does not mean that we will never be able to explain the reflection, the phantom. When we know the thing and the laws of reflection of light, we can always explain, predict, elicit, and change the phantom. And this is what persons with mirrors do. They

study not mirror reflections but the movement of light beams, and explain the reflection. A science about mirror phantoms is impossible, but the theory of light and the things which cast and reflect it fully explain these "phantoms."(Vygotsky, 1997, p. 327)

Vygotsky goes on to state that "it is the same in psychology: the subject itself, as a phantom, must be understood as a consequence, as a result, as a godsend of two objective processes"(p. 327). This perspective represents a radically new understanding of the power of the dialectic in terms of the potential creation of a new approach to psychology, and other disciplines. In Western science and philosophy, the traditional approach is to either focus on the object itself [Erklärung, explanation], debating the quantity, relational values, and so on (as in biological and mathematical sciences); or to focus on the reflection, image, meaning, and the phantom [Verstehen, understanding], (as in traditional phenomenology, psychoanalysis, and ontology). When we start to view the object related to the laws of reflection and the consequences of observation, we can then begin to use a metatheory---understood as a dialectical synthesis---to establish a dialectical psychology. This new psychology will include further "scales"of measurement such as: the genetic-developmental approach, history as change, spontaneous and scientific concepts, sense and meaning, concept formation, and so on. The caveat offered is that "in itself the appearance does not exist"(Vygotsky, 1997, p. 327), and it is exactly the appearance that often becomes the focal point within philosophy, and sometimes within natural sciences as well.

Within a Vygotskian unified framework, being and thinking then coincide at different non-linear, asymmetrical levels. It is precisely the focus on the object, objective, subject, subjective, social, internalization, and so on, connected to the laws of reflection/refraction and consequence, and not a focus on the appearance or phantom that empowers the dialectic to function within a genuine "height"psychology. The reciprocity of this external/internal approach originates both from the world of externalization and objects, which are connected to the world of internalization, offering a more unified subjective/objective stance. Vygotsky tells us that the subjective is the coincidence of two processes that are objective. The example given is the Müller-Lyer illusion of two lines that are of the same length, but psychologically one line appears to be shorter than the other. Vygotsky (1997, p. 325) states that "if I would know the physical nature of the two lines and the objective laws of the eye, as they are in themselves, I would get the explanation of the appearance, of the illusion as a result."Now, Vygotsky continues with his previous thoughts, and they must be viewed metaphorically:

Let us return to the mirror. To identify A and a, the table and its mirror reflection, would be idealism: a is nonmaterial, it is only A which is material and its material nature is a synonym for its existence

independent of a. But it would be exactly the same idealism to identify a with X—with the processes that take place in the mirror. It would be wrong to say: being and thinking do not coincide outside the mirror, in nature (there A is not a, there A is a thing and a phantom); being and thinking, however, do coincide inside the mirror (here a is X, a is a phantom and X is also a phantom). We cannot say: the reflection of a table is a table. But neither can we say: the reflection of a table is the refraction of light beams and a is neither A nor X. Both A and X are real processes and a is their apparent, i.e., unreal result. The reflection does not exist, but both the table and the light exist. The reflection of a table is identical neither with the real processes of the light in the mirror nor with the table itself . . . And, therefore, the objective existence of X and A independent of a is a dogma of materialistic psychology. (Vygotsky, 1997, 328)

The question remains as to how to create a dialectical psychology of language [always connected to the entire personality of a person] from a subjective/objective, philosophical/non-classical scientific point of view? As well, a piece of the puzzle is still missing, which focuses on the wholeness and unity that must underpin a newer non-classical science. It is a simple step that Vygotsky (1997) describes in the following way:

Lewin correctly says that the formation of psychological systems coincides with the development of personality. In the highest cases of ethically very perfect human personalities with a very beautiful spiritual life we are dealing with the development of a system in which everything is connected to a single goal. In Spinoza you will find a theory (I am changing it somewhat) which says that the soul can achieve [that] all manifestations, all conditions relate to a single goal. A system with a single center may develop with a maximal integrity of human behavior. For Spinoza this single idea is the idea of god or nature. Psychologically this is not at all necessary. But a person can indeed not only bring separate functions into a system, but also create a single center for the whole system. Spinoza demonstrated this system in the philosophical plane. There are people whose life is a model of the subordination to a single goal and who proved in practice that this is possible. Psychology has the task of demonstrating that the development of such a unified system is scientifically possible. (p. 107)

The single goal that can be placed at the center of a non-classical psychology is the study of the reflection/refraction of the wholeness of each human consciousness or personality, always viewed

through the prism of the fusion of motivated activity and the internalized mechanisms of self-regulation, understood as a continuing process. It is precisely the role of language that creates this process [which can only be fused with social activity]. At this point we are no longer studying language/semiotic theories which are divorced from the personality. It is precisely the inter-(later, intra-) functional relationships that can be viewed through the metaphor of refraction, and "the changing interfunctional relations thus must become a central issue in the study of consciousness"(Vygotsky, 1994, p. 168). The aspect of refraction is understood from the following standpoint:

[M]ental development does not coincide with the development of separate psychological functions, but rather depends on changing relations between them [emphasis D.R.]…consciousness evolving as a real whole changes its inner structure with each step forward. The fate of each functional ingredient of consciousness thus depends upon the development of the entire system. (Vygotsky, 1994, 167)

In the end, consciousness viewed as an internal/external activity has thought and speech as its key. Certainly, this semiotic/semantic process structures inter-relationships and intra-relationships, where one example could represent the following: A (language [speech, word, word meaning, etc.]) and a (consciousness/the unconscious, personality) also include X (mediation and transformation of personal sense via inner speech and internalization/rooting, resulting from inter/intra-functional relations and activity). Inner speech, often viewed as a subjective component, can be understood as possessing universal objective steps, including abbreviation (made possible by the [functional] syntactic fact of predicativity, cf. Wertsch, 1997, p.123). "The second general characteristic is 'semantic' in nature. For the semantic characterization of inner speech he [Vygotsky] identified three interrelated properties: the predominance of 'sense'over'meaning,' the tendency toward 'agglutination,' and the 'infusion of sense into a word.'"(Wertsch, 1997, p. 124). T. V. Akhutina (2003, p. 61) quotes Vygotsky, in stating that "the transition from inner speech to external speech is not merely vocalization of inner speech but its restructuring, the transformation of a special syntax, of the semantic and phonetic structure of inner speech into other structural forms proper to external speech. "

Now, a and X do coincide as a reflection/refraction of A; however, a is neither A nor X, but its epiphenomenon. Therefore, A and X are real processes, and a is the apparent result of the transformational process. Language use (including A-a-X [a<A=X equals X=a<A in Potebnja's similar, but different, metaphorical formula] is then understood as the basic unity in regulating human consciousness, as a refraction of social and intentional activity, and not as a phantom phenomenon. In a different approach, A. Potebnja states something similar with his formula: "The process of

comprehension of the word and the poetic image is completely analogous to the process of their creation; when we comprehend the spoken word or the poetic work, we experience the same three elements, only in inverse order. In creating the poetic work, at the moment when X is being explained by means of A, a emerges."(in Fizer, 1973, 88).

The purpose of this metaphorical approach is to study the interrelated laws of "light beams"within the reflection/refraction of A, which is represented here by language, viewed as a material entity. It should be remembered that Vygotsky's thoughts were influenced by Wilhelm von Humboldt, who claimed that language "possesses"humans, and through activity (Tätigkeit) human beings appropriate and master language.

Here, we can return to the holographic model and align the different components together metaphorically. "A"[language] represents the laser beam; the interference frequencies/patterns on the plate that turn into the hologram all represent "a"[consciousness/the subconscious, personality], and "X"represents the processes in the mirror, understood metaphorically [mediation, inner speech, monologue, internalization directly resulting from social interaction and activity].

What is still missing is the "diverging lens"needed to direct the laser beams. This element is metaphorically represented by Vygotsky's understanding of displacement, Viktor Frankl's dereflection, V. Sklovkij's deautomatization, and A. N. Leontyev's transference. Viktor Frankl (1985) uses the term dereflection, which ultimately implies being authentic and ultimately giving of oneself. Instead of watching and observing oneself, dereflection contains a sense of temporary forgetting of one's immediacy (cf. Frankl, 1985, 171). Another similar term is deautomatization (making strange, ostranenie).

The role of conflict, of opposition, of deautomatization ("making strange") was central to Eisenstein's contemporaries, the Russian Formalists (in particular, V. Sklovskij and Ju. Tynjanov). In his article "Art as Device"(1919), Sklovskij advanced the view that artistic communication was based on "making strange"(ostranenie) and making difficult (zatrudnenie) perceptions that have become automatized, thus enabling the receiver to derive new information through an active process. (Eagle, 1980, 184)

The last term to be offered as a metaphorical description of the "diverging lens"could be transference (also mentioned by Vygotsky).

Consciousness and the reality reflected by it are connected with one another by real and palpable processes, the result of which is the transition, the "transference,"of the material into the ideal, of objective reality into the fact of consciousness, as well as the opposite transition of consciousness, of the idea, into reality (Consciousness "creates the world."). (A. N. Leontyev, 1989, p. ii)

Metaphorically speaking, the terms displacement, dereflection, deautomatization, and transference could indeed represent the "hole"the "empty space"where the trigger or firing potential [motive] leads to catharsis/transformation. Clearly, it is only at this point that generalization and concept building can take place.

As well, within these thoughts, there is a reverse orientation to the understanding of internal processes, such as inner speech, which are normally viewed as being subjective only. However, there are universal steps in the formation of inner speech. As well, Vygotsky's understanding is usually viewed as being subjective, however, this term can also reflect a different perspective. Inner speech leads to personalized sense. For example, Akhutina (2003, pp. 176-177) states: "Thus, sense represents the unity of affect, perception, and action, all of which, in Vygotsky's opinion, was characteristic for any act of behavior in animal or man."Two other quotes of this nature are from Zinchenko (2002, p. 8): (1). "G. G. Spet [1878-1940] believed that sense originates in being [bytie]. In other words, sense can be considered as something objective-just as the sign, symbol, and other mediators."(2). "Ukhtomsky believed that subjective, mental entities are objectivized in the 'body' of the functional organs of an individual (i.e., virtual organs such as particular skills, as opposed to morphological organs such as an arm"(Ibid., p. 7).

At this point, we should begin to have new reflections on terms such as "word"or "monologue."Regarding "monologue,"most writers within the Vygotskian tradition state that dialogue is a higher form of discourse than monologue, while the reverse is actually true for Vygotsky.

Dialogue implies immediate unpremeditated utterance. It consists of replies, repartee [sic]; it is a chain of reactions. Monologue, by comparison, is a complex formation . . . Psychological investigation leaves

no doubt that monologue is indeed the higher, more complicated form, and of later historical development. (Vygotsky, 1994, p. 242)

With the meta-model described here, active processes can also be understood as being internal, with the presupposition that the subjective is the coincidence of two processes that maintain objective steps. Clearly, inner speech takes on a new role of combining the external with internal processes within both objective steps in its formation and a subjective/objective dialectic in its execution, which can lead to internal and external restructuring and transformation. In closing these thoughts, Taoism offers another metaphorical image:

The simple act of "being"brings us closer to reality. Take the mirror and place it so that you can see into it from the meditation position. The "reflection"in Western thinking is the non-reality, and the real world is on this side of the mirror. In Zen, the reflection is the actual reality, which we have not yet recognized, and nothingness is on this side of the mirror. The reality is that which we seek to understand and in which we find enlightenment. Start the breathing exercise, picturing the mirror in front of you as a mirror in your mind, a point of reflection. You are as much on this side as on the other side. See the whole room from both sides of the mirror, not just the reflection of one side. The mirror of the mind only serves to reflect your being, not your surroundings, and thus you can see from both vantage points. (R. Davies, 2000, p. 78)

It is here that the mirror metaphor stops, to enter a more practical plane of the unity of the individual and the social via the all encompassing aspect of language:

If language is as old as consciousness itself, and if language is a practical consciousness-for-others and, consequently, consciousness-for-myself, then not only one particular thought but all consciousness is connected with the development of the word. The word is a thing in our consciousness, as Ludwig Feuerbach put it, that is absolutely impossible for one person, but that becomes a reality for two. The word is a direct expression of the historical nature of human consciousness. (Vygotsky, 1994, p. 256)

The thoughts in this paper are only offered as a mental game, a metaphor, approaching a metatheory, and should not be understood as an inductive approach to science within Cartesianism. The purpose is to begin to form images of the ideal and real, which are then transformed via mediation into psychological tools that can serve to strengthen self-regulation, which ultimately returns one to the socialized world of interpersonal relationships, and the freedom of human action. The intention of this metaphor is to separate phantom appearances from the processes of reflection/refraction, viewing all of life [and of course, psychology/philosophy] from the perspective of unity and synthesis, and from the vantage point of the concept of the unified "cell"in Marxism, or "monism"in Spinozian thinking. The ultimate paradox with this metaphorical model is the understanding that human consciousness, as the subject of study, actually represents a, not A and X. The ultimate goal is not to discover consciousness as such---an impossible task as we cannot stand outside of our own subjectivity---but rather to discover personal freedom of action within Spinozian social determinism (i.e., guiding our actions to the good of the whole). A. N. Leontyev (1933/1989) wrote about Vygotsky's understanding of consciousness, by stating that:

The developed meanings turn toward the external world. The behavior of man becomes reasonable and free in the external sense. It turns toward the person him/herself—his/her behaviour acquires characteristics of will. The world of emotions, the world of inner experience is generalized---humans get out of the "bondage of [the] emotions,"people contain an inner freedom. That is the ideal of Spinoza. The assertion of reason and freedom in humans is the inspiration of the whole of Lev Semenovich's thought regarding consciousness. (p. viii)

At this point, Vygotsky's cultural-historical method, now focuses on the transformative character of inner speech, becoming an organic (Zinchenko, 2002), non-classical metapsychology that begins to regulate both internal and external activity.

The trajectory of the construction of knowledge within cultural-historical and activity theory goes from the abstract to concrete. In using the metaphor of a mirror reflection, the attempt is to also go from abstract ("…an undeveloped unity of identical aspects of a representation of a thing or process"[Braun,

1991, p. 36]), to concrete ("…a developed unity of diverse aspects of a representation of a thing or process"[Braun, 1991, p. 36]). In short, "the abstractions must be made concrete by finding their real connections within the concrete, integral whole of learning/teaching within the societal process"(Tolman, 1999, p.77). Within the cultural-historical and activity theory traditions, knowledge is not constructed via rules of procedure, but rather by mastering the principles of methodology, which are different from methods and procedures. Experience, intuition, and intelligence are needed to establish a psychology with the individual understood as an active agent in personal and social change (cf. Tolman, 1999, p. 78). Using metaphors and meta-theories at this stage offers a higher level of generalization, which can be applied to concrete situations, but not within the empiricist mode of rules and regulations. The goal is not just to study language theories, but to connect language theories to a higher psychology of the entire personality of a human being. One of the most famous quotes by Vygotsky can be understood within a holographic frame of reference:

Consciousness is reflected in the word like the sun is reflected in a droplet of water. The word is a microcosm of conscious, related to consciousness like a living cell is related to an organism, like an atom is related to the cosmos. The meaningful word is a microcosm of human consciousness. (Vygotsky, 1987, 285)

In conclusion, we will allow Vygotsky to close this paper with his words:

As Koffka [1924, p. 160] says, the mental processes point forward and beyond themselves to the complex psychophysiological wholes of which they form a part. This monistic integral viewpoint is to consider the integral phenomenon as a whole and its parts as the organic parts of this whole. Thus, the detection of the significant connection between the parts and the whole, the ability to view the mental processes as an organic connection of a more complex integral process---this is dialectical psychology's basic task. (Vygotsky, 1997, 115)

Afterword:

In the heaven of Indra there is said to be a network of pearls so arranged that if you look at one you see all the others reflected in it. In the same way, each object in the world is not merely itself but involves every other object, and in fact is every other object. (Wilber, 1982, 25)

1For a discussion of perception see Robbins, 2003, 131-133.

2"We have argued that the brain is not organized like a computer, that its functioning rests instead on such properties as variability, differential amplification, degeneracy, and value."(Edelman, 2000, 93)

3There are different areas of constructivism. Regarding constructivism in education, refer to Robbins, 2003, 55-72).

4Refer to J. LeDoux (2002, 88-89) for four basic criticisms of constructivism.

5Parts of the section on Physics were taken from D. Robbins (2005, 27-29).

6Parts of this section were taken from D. Robbins (2003, 303-312). References

Akhutina, T. V. (2003). Psychology of Speech and Neuropsychology [Special double issue with articles by T. V. Akhutina]. Journal of Russian & East European Psychology, 41, 3/4

Alford, D. (1981). Reality, mind, and language as field wave and particle. Internet: http://www.enformy.com/dma-rml.htm

Bentov, I. (1982). Comments on the holographic view of reality. In Ken Wilber (Ed.), The holographic paradigm and other paradoxes. Boulder, London: Shambhala.

Bohm, D. (1980). Wholeness and the implicate order. London, New York: Arc Paperbacks.

Bolinger, D. (1977). Meaning and form. New York: Longman.

Braun, C. M. J. (1991). The Marxist categories of the "abstract" and "concrete" and the cultural-historical school of psychology. Multidisciplinary Newsletter for Activity Theory. 7/8, 36-41.

Bruner, J. (1990). Acts of meaning. Cambridge, MA: Harvard University Press.

Cupchik, G.C. and J. Laszlo (Eds.). (1992). Emerging visions of the aesthetic process: psychology, semiology, and philosophy. Cambridge, England: Cambridge University Press.

Davies, R. (2000), Zen Wisdom, East Sussex: England.

Deacon, T. (1997). The symbolic species. New York, W. W. Norton & Company.

Dychtwald, K. (1982). Commentaries on the holographic theory: Reflections on the holographic paradigm. In Ken Wilber (Ed.), The holographic paradigm and other paradoxes, (pp. 105-112) Boulder, London: Shambhala.

Eagle, H. (1980). Eisenstein as a semiotician of the cinema. In R. W. Bailey, L. Matejka, and P. Steiner (Eds.), The sign: Semiotics around the world, (pp.173-193). Ann Arbor: Michigan Slavic Publications.

Edelman, G. (2000). A Universe of Consciousness. New York: Basic Books.

Elman, J., Bates, E., Johnson, M, Karmiloff-Smith, A., Parisi, D., Plunkett, K. (2001). Rethinking innateness: A connectionist perspective on development. Cambridge, MA: The MIT Press.

Elkonin, D. B. (1989). Ob istochnikakh neklassicheskoi psikhologii (On the sources of non-classical psychology) (pp. 475-478). In D. B. Elkonin Izbrannye psikhologicheskie trudy. Moscow: n. p.

Fillmore, C., Kaye, P., O'Connor, M. (1988). Regularity and idiomaticity in grammatical constructions: The case of let alone. Language, 64, 501-538.

Fizer, J. (1973). Alexander A. Potebnha's psycholinguistic theory of literature. Cambridge, MA: Harvard University Press.

Frankl, V. (1985). The unheard cry for meaning. New York: Washington Square Press

Frankl, V. (2000). Man's search for ultimate meaning. Cambridge, MA: Perseus Publishing.

Hariharan P. (2002). Basics of holography. Cambridge, England: Cambridge University Press.

Ilyenkov, E. (1977). Problem of dialectical materialism. Moscow: Progress.

Innis, R. (1982). Karl Bühler: Semiotic foundations of language theory. New York: Plenum.

Kasper, J. & Feller, S. (2001). The complete book of holograms. Mineola, New York: Dover Publications, Inc.

Lakoff, G., Johnson, M. (2003). Metaphors to live by. Chicago: University of Chicago Press.

Langacker, R. (1987). Foundations of cognitive grammar (Vol. 1). Palo Alto, CA: Stanford University Press.

LeDoux, J. (2002). Synaptic self: How our brains become who we are. Harmondsworth, Middelsex, England: Penguin.

Leontyev, A. N. (1933/1989). Notes on consciousness. Multidisciplinary Newsletter for Activity Theory. 3/4, i-viii.

McTaggart, L. (2002). The field: The quest for the secret force of the universe. New York: Harper Perennial.

Moore, R, & Carling, C. (1987). Chomsky: Consensus and controversy---Introduction. In S. Modgil et al. (Eds.), Noam Chomsky: Consensus and controversy (pp. 11-28). New York: The Falmer Press.

Ponzio, A. (1990). Man as a sign: Essays on the philosophy of language. Berlin, New York: Mouton de Gruyter.

Pribram, K. (1971). Languages of the brain: Experimental paradoxes and principles in neuropsychology. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.

Pribram, K. (1982). What the fuss is all about. In Ken Wilber (Ed.), The holographic paradigm and other paradoxes (pp. 27-34). Boulder and London: Shambhala.

Robbins, D. (1999). Prologue. In Robert W. Rieber (Ed.), The Collected Works of L. S. Vygotsky. Vol. 6: Scientific legacy, (pp. v--xii), New York: Kluwer Academic/Plenum Publishers.

Robbins, D. (2001). Vygotsky's psychology--philosophy: A metaphor for language theory and learning. New York: Kluwer Academic/Plenum Publishers.

Robbins, D. (2003a). Vygotsky's and A. A. Leontiev's semiotics and psycholinguistics: Applications for education, second language acquisition, and theories of language. Westport, CT: Praeger.

Robbins, D. (2003b). Using Metaphors in Vygotsky's Non-Classical Theories of Language. Journal for the Theory of Social Behaviour, 33/3, pp. 303-312.

Robbins, D. (2005). Generalized Holographic Visions of Language in Vygotsky, Luria, Pribram, Eisenstein, and Volosinov. Intercultural Pragmatics, 2/1, 25-39.

Sobkin, V. S. & Leontiev, D. A. (1992). The world of images and the image of the world. Soviet Psychology, 20, 3-27.

Talbot, M., (1992). The holographic universe. New York: HarperPerennial.

Tolman, C. W. (1999). Society versus context in individual development: Does theory make a difference? In Yrjö Engeström, Reijo Miettinen, and Raija-Leena Punamäki, Perspectives on activity theory (pp. 70-86). Cambridge, England: Cambridge University Press.

Tomasello, M. (Ed.) (2003). The new psychology of language (Vol. 2). Mahwah, New Jersey: Lawrence Erlbaum Associates, Publishers.

Varela, F., Thompson, & Rosch, E. (1997). The embodied mind. Cambridge: The MIT Press.

Vocate, D. (1987). The theory of A. R. Luria: Functions of spoken language in the development of higher mental processes. Hillsdale, New Jersey: Lawrence Erlbaum Associates, Publishers.

Vygotsky, L. S. (1994). Thought and language. Alex Kozulin (Ed.). Cambridge, MA: The MIT Press.

Vygotsky, L. S. (1997). The collected works of L. S. Vygotsky. Vol. 3. Problems of the theory and history of psychology. In R. W. Rieber and J. Wollock (Eds.). New York: Plenum Press.

Weber, R. (1982). "Field of consconsciousness and field ethics." In Ken Wilber (Ed.), The holographic paradigm and other paradoxes. Boulder, London: Shambhala.

Wertsch, J. V. (1997). Vygotsky and the social formation of mind. Cambridge, MA: Harvard University Press.

Wilber, K. (1982). The holographic paradigm and other paradoxes. Boulder, London: Shambhala.

Yaroshevsky, M. (1992). L. S. Vygotsky I marksizm v sovetskoi psihlogii. Psychologicheskii Journal, 13, 5, pp. 84--99.

Yaroshevsky, M. (1999). Epilogue. In Robert W. Rieber (Ed.), The collected works of L. S. Vygotsky, Vol. 6, Scientific Legacy, (pp. 245-266). New York: Kluwer Academic/Plenum Publishers.