

15 Classroom Discourse and Interaction in the Zone of Proximal Development

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1. Introduction

Lev S. Vygotsky (1896–1934), a psychologist who practiced in the former Soviet Union from the 1920s to his death in 1934, is best known amongst English speakers for his concept of the Zone of Proximal Development (ZPD). This concept's popularity flows from the insights it offers into the relationship between children's learning and development and what that means for their future learning. Vygotsky's most extensive writings on the ZPD describe his use of it as an analytic tool in three investigations: (1) His critique of intelligence and diagnostic tests because they measured what children could accomplish in independent problem solving, but not what they could accomplish through cooperation with an adult or more advanced peer. A summary of this critique and his description of the concept of the ZPD as a central part of this critique appears in *Mind in Society* (Vygotsky 1978); (2) his analysis of child development in 'The Problem of Age,' (Vygotsky 1998) where he analyzes the 'internal logic of the process of [children's] development' (p. 192), focusing on times of qualitative transformation in the interrelationship of these processes – times he uses to divide development into age levels or periods (Chaiklin 2003; Mahn 2003); and (3) his analysis of concept development and particularly the relationships between everyday concepts and academic concepts, described in 'The Development of Scientific Concepts in Childhood,' Chapter six in Vygotsky's most important work, *Thinking and Speech* (1987). The concept of the ZPD plays a significant role in Vygotsky's analysis of the character and development of spontaneous/everyday concepts and of scientific/academic concepts.¹ While these three investigations are distinct in that they have different foci for analysis, they are united by Vygotsky's use of his general concept of ZPD in all of them.

A complete understanding of Vygotsky's concept of the ZPD requires not only examining its use in these three investigations, but also situating it in his theoretical framework and methodological approach. This chapter gives brief overviews of the first two investigations, with examples of studies that draw on them and then gives a more detailed overview of Vygotsky's theory of concept development as a foundation for describing his third investigation, which uses the ZPD to analyze the relationship between everyday concepts and

academic concepts. The chapter concludes with a description of a project that used Vygotsky's theory of concept development as a theoretical foundation. The description of this project centers on ways in which classroom discourse and interaction can be enhanced if classroom teaching/learning² is guided by lessons drawn from Vygotsky's investigation of everyday concepts and academic concepts.

2. Zone of Proximal Development

Knowledge of the ZPD gained traction in the English-speaking world with the 1978 publication of a compilation of Vygotsky's writings in *Mind in Society*, a chapter of which presents extracts from a lecture Vygotsky gave late in his life. In this lecture he argued against the prevalent use of intelligence and other types of diagnostic tests as central guides for teaching, claiming they conceal what should be an important consideration in assessment and teaching, namely how to determine the nature of teaching that facilitates students reaching their potentials in future learning. Vygotsky's claim was that intelligence and diagnostic tests measure what children can do in *independent* problem solving, revealing their actual level of achievement/development at the time of testing, but not their potential for future learning. To examine children's potential for future development, Vygotsky used the concept of the ZPD.

To explain the ZPD, he gives an example of two 10-year-old children who, in independent problem solving, are able to do tasks at an eight-year-old level of mental development. Rather than assuming that both students have the same capacity for future learning, Vygotsky poses the question: 'Suppose that I show them various ways of dealing with the problem?' and then describes different ways experimenters can offer assistance:

Some might run through an entire demonstration and ask the children to repeat it, others might initiate the solution and ask the child to finish it, or ask leading questions. ... Under these circumstances [with assistance] it turns out that the first child can deal with problems up to a twelve-year-old's level, the second up to a nine-year-old's. Now, are these children mentally the same? (1978, p. 86)

Vygotsky argues that these two children would have different paths of learning in the classroom and would need guidance differentiated for each child's different ZPD, which he defines 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. (1978, p. 86)

This paragraph is almost universally quoted whenever the ZPD is referenced, including in some of the older, more widely-cited interpretations of his work (John-Steiner and Mahn 1996; Kozulin 1990; Tharp and Gallimore 1988; van der Veer and Valsiner 1991; Wertsch 1985). When writing about the ZPD in relation to intelligence and diagnostic tests, Vygotsky underscored the importance of collaboration and guidance, but he died before he was able to describe how teachers could use collaboration and guidance in their classrooms guided by the concept of ZPD. He did stress that teachers should recognize that different students have different potentials for learning based on different zones of proximal development. Because Vygotsky was not able to elaborate on how he would recommend that the concept of ZPD be applied to practical teaching, there is a wide variation in the way that this concept has

been used in pedagogical applications, ranging from approaches that emphasize skill-drill as a central piece of the curriculum to approaches that value the whole child in all of his or her complexity and consider the broader social forces.

In one of the most comprehensive overviews of the ZPD, Chaiklin (2003) describes examples in an expanding number of fields where the *term* ZPD is used and attributed to Vygotsky, but do not reflect an understanding of his use of the concept. Some of these fields include moral education, nursing, computer-mediated communications, violin teaching, and psychoanalysis, among others; however, the concept of the ZPD is often extrapolated from the sociocultural framework Vygotsky used to develop and situate it. Consequently, they lose the explanatory power and interpretive perspective the concept provides. Even within education, the field in which the most sociocultural research has been done, the ZPD has been used 'to justify forms of teaching that seem quite incompatible with this theory as a whole' (Wells 1999, p. 313).

Those studies that do situate the ZPD in Vygotsky's general sociocultural theoretical framework often operate with an incomplete understanding of the concept if they do not account for all three of the investigations in which it played a central role. Because many studies present an incomplete understanding of Vygotsky's concept, it has been referred to as the most over-used, least-understood concept in educational studies. Among the studies that have consistently drawn on Vygotsky's theoretical framework are language studies, particularly in second language acquisition (SLA). While Vygotsky's focus was on concept development in young children and adolescents, sociocultural approaches to second language acquisition (SLA) research have shown its utility in analyzing the centrality of talk and social interaction in adult language learning, teaching, and acquisition. Playing the leading role in this effort, James Lantolf and his colleagues have shown how sociocultural theory can illuminate the processes taking place in second and foreign language classrooms (Lantolf 2000; Lantolf and Appel 1994; Lantolf and Poehner 2008; Lantolf and Thorne 2006). (See Lantolf and Beckett (2009) for a detailed bibliography of this work, as well as for the references to the Lantolf volumes above and the references in the paragraph below.)

Studies in SLA which have focused on the ZPD include: (a) a longitudinal study with university students on feedback provided by an expert in learners' ZPDs that found that language development is a process that varies across learners, across proficiency levels, and across concepts or skills to be learned (Aljaafreh and Lantolf 1994); (b) a study that examined peer dialogue and scaffolding within students' ZPDs as they collaborated to complete a difficult task (Donato 1994); (c) a study on the role of repetition in collaborative writing sessions among adult L2 learners which found that repetition within their ZPDs helped scaffold the completion of their writing tasks (DiCamilla and Antón 1997); (d) a study on social interaction in peer revision during an L2 writing class with adults that found that the interaction helped to scaffold peer revision (de Guerrero and Villamil 2000); and (e) three case studies of college-level L2 learners, in which Thorne (2003) documented the influence of the ZPD on students' web-based dialogue and the use of different web-based discussion formats that helped students succeed in communicating meaning for different purposes through different media.

3. Zone of Proximal Development and Periods in Child Development

A more complete understanding of Vygotsky's concept of the ZPD needs to incorporate his use of it to investigate the 'internal causal-dynamic and genetic connections that determine the process itself of mental development' (1998, p. 203). In examining the internal logic of

development, Vygotsky focused on times of transition between one age level and the next, using the concept of ZPD to help him achieve his goal of studying 'the whole sequence of the course of child development, of all the features of each age, stage, and phase, of all the basic types of normal and anomalous development, of the whole structure and dynamics of child development in its many forms' (p. 200). In asserting that each age level has its own ZPD, he argued, 'there is for the child a specific zone of intellectual imitation connected with the actual level of development' (p. 202). He differentiates his use of the term *imitation* from that which can be applied to animals. In using this term, he is not referring to

mechanical, automatic, thoughtless imitation, but rather sensible imitation based on understanding the imitative carrying out of some intellectual operation. ...Everything that the child cannot do independently, but which he can be taught or which he can do with direction or cooperation or with the help of leading questions, we will include in the sphere of imitation. (1998, p. 202)

Seth Chaiklin (2003), in his comprehensive chapter on Vygotsky's use of ZPD to analyze the movement and transitions from one age level to another, describes the role of imitation in these transitions. He also uses the concepts of *subjective* and *objective* zones of proximal development to clarify the nature of the movement and transitions. In describing the transition from one age to the next, he designates a 'tripartite constellation of present age, maturing functions, and next age as the *objective* ZPD' (p. 49) – *objective* because 'it does not refer to an individual child but reflects the psychological functions that need to be formed during a given age period in order for the next age period to be formed' (p. 49). He uses the term *subjective* ZPD to refer to the degree which the individual 'child's currently maturing functions are realizing the structure of the next age period' (p. 50).

Mariane Hedegaard, who was a pioneer in the study of the ZPD, has collaborated with Seth Chaiklin in conducting research projects using a concept of the ZPD that incorporates Vygotsky's analysis of its role in determining movement and transition in child development (Chaiklin and Hedegaard 2013; Hedegaard and Chaiklin 2005). They used a teaching strategy they call a 'double move,' in which 'the teacher's planning of the instruction must advance from the abstract characteristics and general laws of a subject-matter area to the concrete reality, in all its complexity' (Hedegaard and Chaiklin 2005, p. 70). Attention was paid to the inquiry process as students formulated questions to investigate the content of their community, using the scientific methods they had learned in the project. This gave them opportunities 'to use intellectual tools to explore content related to their everyday life in new ways, and to elaborate their everyday understandings through academic concepts' (Chaiklin and Hedegaard 2013, p. 42). Hedegaard (1990) reports on ways that the concept of the ZPD was used in a research project that followed the same class from 3rd to 5th grade in social sciences in a Danish elementary school. Using the concept of the ZPD as a background, her work connects a 'general psychological perspective on child development with a pedagogical perspective on the instruction' (Hedegaard 1990, p. 349).

Hedegaard (2003) summarizes how the discourse, inquiry, and interaction between students and teachers created zones of proximal development, helping to motivate and engage students and helping teachers and researchers to 'understand how the dialectic relationship between abstract and concrete aspects of a conceptual system can be combined with personal experience to become part of a person's conceptual understanding' (p. 148). This was also a guiding principle of the Academic Literacy for All (ALA) project (Mahn, Bruce, and Adams 2010), which relied on all three of Vygotsky's investigations, but focused in particular on his the concept of ZPD as an analytic tool to describe the relationship between everyday concepts and academic concepts. As a foundation for describing this work, I present an overview of Vygotsky's theory of concept development in some detail as laid out

most fully in his last major work, *Thinking and Speech* (1987). This provides a theoretical framework for developing the guiding principles for the collaboration and the classroom discourse and interaction used by the ALA project based on the ZPD.

4. Vygotsky's Theory of Concept Development

Vygotsky (1987) uses the concept of the ZPD as an important component in his examination of the relationships between the *everyday concepts* that young children acquire as they make meaning of their worlds through language in social interaction with others, and the *academic concepts*, which they encounter in school as they learn reading, writing, mathematics, and the natural and social sciences. He argues that these two types of concepts have distinct lines of development because they are based on different modes of thinking. These lines of development have their origins in two different domains, the academic in the domain of conscious awareness and volition, which Vygotsky describes using the metaphor of growing downward to the concrete. On the other hand, everyday concepts have their origin in the domain of the concrete, the domain of personal experience. While the line of academic concepts moves toward the concrete, the line of development of everyday concepts 'moves toward the higher characteristics of concepts, toward conscious awareness and volition. The link between these two lines of development reflects their true nature. This is *the link of the zone of proximal and actual development*' (p. 220, emphasis in original). Exploring Vygotsky's analysis of this relationship reveals ways in which teachers and students, through interaction and discourse in the classroom, can be engaged in effective teaching/learning. Before describing how that was accomplished in the Academic Literacy for All project, I briefly describe Vygotsky's theoretical framework focusing on his theory of concept development.

While his overarching aim was to analyze the relationship between thinking and speaking as a way to understand human development and as a key component in human consciousness, Vygotsky (1997) focused on the role that social interaction and cultural practice – 'the processes of mastering external materials of cultural development and thinking: language, writing, arithmetic, drawing' (p. 14) – played in the development of individual psychological functioning and development. He was particularly interested in the role of language in this development as it mediated human interaction in social worlds and was instrumental in the internalization of this social activity.

Every function in the child's cultural development appears twice: first, between people (inter-psychological) and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of ideas. All the higher functions originate as actual relationships between individuals. (Vygotsky 1978, p. 57)

Vygotsky saw the unification of the language processes and thinking processes as key to this internalization and to concept development.

While Vygotsky investigated children from birth, looking at the development of their means of perception in relationship with the developing psychological functions, such as memory, attention, thinking, emotions, imagination, and will, his main focus was on the unification of speaking/language processes and thinking processes at the time of language acquisition (Vygotsky 1987). These two processes previously had independent paths of development with children using language without thought – babbling and playing with sounds – and thinking without language – the elementary thinking processes similar to those that exist in the animal kingdom – but thinking and speaking become unified with the acquisition of language. To study this unification and its relationship to concept formation in

systems, Vygotsky and his colleagues conducted experiments, from which he derived three main stages in the formation of concepts – *syncretic thinking*, *thinking in complexes*, and *thinking in concepts* – each stage having a qualitatively different mode of thinking than the others. Clarifying the differences in these modes of thinking and the transitions between them is crucial for understanding Vygotsky's use of the concept of the ZPD, because he uses the concept of ZPD to explain the transition from the mode of thinking behind everyday concepts to the mode of thinking necessary to acquire academic concepts.

The first two stages of concept development – syncretic and thinking in complexes – provide the foundation for and constitute everyday concepts, while the third stage – thinking in concepts – builds on that foundation and is instrumental in the acquisition of academic concepts. A central aspect of each of these different modes of thinking is *generalization*, because changes in the child's use of generalization help define the differences between the three stages of concept development. Generalization is central to the unification of the thinking and speaking/language processes, since 'The basic and central feature of any word is generalization. All words generalize' (1987, p. 249) and generalization is an act of thought.

In the first stage, when the child is early in the process of acquiring language, the unification of thinking and speaking is accomplished through generalization, as children, in interaction with adults, apply language to amalgamated visual images. In this act of generalization, children bring together 'a series of elements that are externally connected in the impression they have had on a child but not unified internally among themselves' (1987, p. 134). A defining characteristic of the mode of thinking at this stage is that relationships children make based on their experiences, particularly those involving visual perception, do not correspond to relationships in the real world or to the common use of language. As children acquire and develop their language in interaction with adults, there is a qualitative transformation in their mode of thinking from the syncretic stage to thinking in complexes.

This mode of thinking 'leads to the formation of connections, the establishment of relationships among different concrete impressions, the unification and generalization of separate objects, and the ordering and the systematization of the whole of the child's experience' (Vygotsky 1987, p. 135). Children, who are beginning to think in complexes, use language to unite 'complexes of distinct concrete objects or things...on the basis of objective connections, connections that actually exist among the objects involved' (p. 136). This stage of thinking is tied firmly to the empirical world and children's experience in it. In this stage, while the child and the adult both use the same word to focus on an object, and in their shared contact they are able to communicate, they use different forms of thinking to arrive at using the word. The 'child thinks the same content differently, in another mode, and through different intellectual operations' (1987, p. 152). Vygotsky asserts that just because children can use a word does not mean they have the concept, which he claims is 'the central point, the main thought, of our entire work' (1987, p. 241) (see also Bloome, this volume). 'The development of the corresponding concept is not completed but only beginning at the moment a new word is learned. The new word is not the culmination but the beginning of a concept' (p. 241). Through discourse and interaction the concept behind the word grows, especially when it is situated in systems. The internal meaning that the child is constructing becomes divorced from the word that represents the concept. 'Meaning becomes increasingly independent of the form in which it is expressed' (Vygotsky 1987, p. 228).

In this process the child is developing the psychological functions necessary to think in concepts. 'The development of concepts...presupposes the development of a whole series of [psychological] functions...voluntary attention, logical memory, abstraction, comparison, and differentiation' (1987, p. 170). The development of these functions is accomplished through the unification of thinking and language/speaking processes. Although the foundation for concepts is laid when children begin to acquire language, they do not think

in concepts until they reach adolescence (Vygotsky 1998). As the child begins to isolate and abstract separate elements, and 'to view these isolated, abstracted elements independently of the concrete and empirical connections in which they are given' (1987, p. 156), they are laying the foundation for the transition to thinking in concepts, being able to think abstractly. (For a more in-depth description of Vygotsky's theory of concept development, see Mahn 2012).

Vygotsky felt that there was a final piece missing in his analysis of the transition from thinking in complexes to thinking in concepts – a piece he would find in his analysis of the relationship between everyday concepts and scientific/academic concepts and the ZPD as a link between the two. Vygotsky defines what he means by everyday concepts – 'spontaneous, situationally meaningful...in the sphere of experience and the empirical' (p. 220) – and academic concepts, which have their strength in 'conscious awareness and volition' along with being organized into systems. Vygotsky's analysis of these components in Chapter six of *Thinking and Speech*, 'An Experimental Study of Concept Development,' lays the foundation for his explanation of the ZPD as the link between everyday concepts and academic concepts.

Based on findings from the experiments he and his colleagues conducted on the relationship between everyday and academic concepts, Vygotsky concluded:

These findings seem to allow us to clarify the most important aspects of a question of great interest to us, namely, the question of the relationship between scientific [academic] and everyday [spontaneous] concepts in the first moments of a given system of knowledge. ...These findings lead to the conclusion that *the development of scientific and spontaneous concepts take opposite paths* (emphasis in the original). (p. 217)

It was through his studies on *actual* concepts in Chapter 6 (as opposed to his work on *experimental* concepts in Chapter 5) that Vygotsky (1987) reached the conclusion that '*the development of [academic] and everyday concepts take opposite paths*' (p. 217, emphasis in the original), which he says is 'a key point of our hypothesis' (p. 217). Following an analysis of the character and movement of these two lines of development, Vygotsky uses the metaphor of a link to describe how the concept of the ZPD reveals the true nature of both everyday concepts and academic concepts.

5. Everyday Concepts and Academic Concepts

When he moved to examining *actual* concepts instead of those created in an experimental context, Vygotsky found that there were several significant problems in the experimental work.

The fundamental weakness of our previous research lies in the absence of any real self-development, in the absence of any real connection between the stages of development. This shortcoming was a function of the very nature of the experiment. ...As a consequence, we inherently saw these stages as moving along on a single plane rather than as forming a spiral based on a series of connected and ascending circles. (Vygotsky 1987, p. 229)

The final piece in constructing this spiral was explaining the transformation from thinking in complexes to thinking in concepts using the concept of the ZPD to help analyze 'the self-movement inherent in the development of concepts or the *internal connections* among the various stages of development' (p. 229). Vygotsky states that his research on actual academic concepts and everyday concepts 'led to the final link in the chain of transitions from one

stage to another' (p. 231). He used the concept of ZPD to describe the transition from school child to adolescent, from thinking in complexes to thinking in concepts. In discussing this transition, he adds 'our research on [academic] concepts and everyday concepts casts light on a middle link that we have been unable to make up to this point' (p. 231). Through this illumination, Vygotsky writes, 'the issue of the links and transitions between the various stages of concept development is completely resolved. We have resolved the question of the self-movement of developing concepts' (p. 231).

Vygotsky used the metaphor of everyday concepts growing up to the more abstract academic concepts, while academic concepts, which rely on conscious awareness and volition for acquisition and represent organized human knowledge and understanding, grow downward into the concrete, personal experience of everyday concepts. 'Scientific [academic] concepts restructure and raise spontaneous [everyday] concepts to a higher level, forming their ZPD. What the child is able to do in collaboration today, he will be able to do independently tomorrow' (Vygotsky 1987, p. 220).

While Vygotsky died before he was able to fulfill his plan of describing what collaboration based on the ZPD would look like in the classroom, his explanation of the ZPD as the link between everyday concepts and academic concepts implicitly helps provide a framework for the nature of the collaboration he envisaged taking place between teachers and students. His vision of collaboration relies on teachers recognizing the centrality of the interaction between students' everyday concepts, which they bring to school and the academic concepts they encounter there.

To help differentiate between everyday concepts and academic concepts, Vygotsky looked at three central aspects of academic concepts: 1) *conscious awareness* of the concept being learned; 2) *volition*, the ability to voluntarily control the use of the concept; and 3) *systematicity*, the organization of all concepts into systems in which there are subordinate and superordinate concepts. Teachers wanting to use the concept of the ZPD to organize classroom discourse and interaction to facilitate the development of students' academic concepts need to keep these three central aspects in mind.

Vygotsky points out that a key difference between everyday concepts and academic concepts is that there is conscious awareness and voluntary control with academic concepts while everyday concepts are governed more by spontaneity and actions tied to an immediate context. To illustrate what he means by conscious awareness, Vygotsky (1987) draws analogies to students learning to write and learning a second or foreign language. When children are learning to write, they are conscious of the fact that they are learning a new skill/function, just as when they are learning a foreign language in school, they are aware of the learning process, an awareness absent in the initial years of the acquisition of their native language. Vygotsky makes connections between conscious awareness and volition because children's awareness of a concept helps lead to control of it, such as them becoming aware of and controlling their attention. Likewise, through the learning activities in which they are engaged, students become aware of the fact that they need to use their memory, and with that awareness begin to control their use of it. Conscious awareness plays a significant role in the transformation of thinking as students, around adolescence, become aware of their own thinking processes and learn how to control their learning and to think in concepts, which is key to attaining academic concepts.

In addition to conscious awareness and voluntary control, recognition of systematicity can help guide language use and interaction in a classroom. All concepts exist in systems and if students can learn concepts by exploring them in systems, they will understand them more deeply. Vygotsky's understanding of the ZPD as the link between children's everyday concepts and academic concepts is rarely considered in analyses of students' ability to use abstract thinking by thinking in concepts. As a consequence, ways to use this understanding

of the ZPD to create effective teaching/learning opportunities in classrooms have not been widely explored.

Teaching/learning is maximized by addressing the following questions: What is the nature of the cooperative interaction among students and between students and teacher? What is the discourse students use to convey their everyday concepts and what discourse do the teacher and the texts use to convey academic concepts? How does children's use of language reflect cultural, community, and family influences? How can interaction and opportunities for language be organized to help students gain understanding of the concept being presented? These questions helped guide the work of the Academic Literacy for All Project.

6. The Academic Literacy for All Project

The Academic Literacy for All (ALA) professional development project, which was based on Vygotsky's theoretical framework, had two main goals: first, helping secondary school teachers understand how they could facilitate the language and literacy development of their English learners³ (ELs) at the same time they were teaching the content in their subject area; and second, helping teachers understand how they could facilitate students' conceptual understanding and provide opportunities for them to display such understanding by using concepts to problem solve in different circumstances than those in which they were learned. The emphasis in the ALA project on using oral and written language in the classroom helped students gain conceptual understanding by giving them access to the concepts – the *subject matter* to be learned – through the use of language and interaction; and by providing an important source of *linguistic input* for acquiring English (Wong Fillmore 1982). Classroom discourse and interactive opportunities to use language thus become essential aspects to facilitate linguistically diverse students' learning and thinking in school.

The six-year Academic Literacy for All project, which spanned two school districts and involved the staffs of 15 middle and high schools, was based on Vygotsky's notion of the ZPD in all three of the investigations as described above. Teachers were selected from the participating schools and attended a semester-long seminar in which they were introduced to Vygotsky's concept of the ZPD and how to teach for conceptual understanding. The project helped teachers see the role they could play in changing the nature of classroom discourse and student interaction so that it would facilitate the transformation students make in adolescence from thinking in complexes (everyday concepts) to thinking in concepts (academic concepts). To help teachers accomplish this we developed a protocol designed to create opportunities for students to use written and spoken language which would help them stretch their everyday concepts up toward the academic concept being presented in a unit and to stretch the academic concept down, transforming both in the process (Mahn, Bruce and Adams 2010). The key to creating teaching/learning opportunities that rely on the concept of the ZPD is to encourage students to draw on their own experiences and use their own understanding of a particular concept as a starting point.

The protocol, so called because it is a sequence of strategies, is used at the beginning of a unit; thus, the first step for teachers in introducing a new concept is to look at how the concept fits into systems with other concepts. Often teachers are so immersed in their own content that they don't stop to consider the subordinate and superordinate concepts that help to form the system of which a particular concept is a part. After examining the central concept in a system of concepts, teachers conceive of ways to connect the academic concepts with the everyday concepts students have developed through their social interactions and language use in the world around them. This entails finding where students are in their

development regarding a particular concept, especially how their everyday concepts relate to it. Since students at the secondary level have been in school for a number of years, they will have acquired a good number of academic concepts, so there is not a firm line of demarcation between everyday concepts and academic concepts. Hedegaard and Chaiklin (2005) emphasize that

Vygotsky's distinction is sometimes misinterpreted as describing a hierarchical organization with concrete everyday concepts on the bottom and abstract, scientific concepts on the top, or a replacement of everyday concepts with scientific concepts. In fact Vygotsky viewed everyday and scientific concepts as being parts of a single psychological system, where the development of scientific concepts results in changes in the everyday concepts. (p. 35)

There is usually a wide range in students' experiences and the concepts they have developed, which makes it difficult to determine where each student is in relationship to the concept being introduced, especially in the larger classes at the secondary level. However, doing so can help guide the creation of opportunities for interaction and language use, which are important aspects of the kind of effective collaboration that creates the ZPD. For example, a teacher in the ALA project introduced the concept of *genre* by having students first write individually about how music is organized and then in pairs and groups further write and discuss the organization of music. Then they generated rules about the organization of music. By starting with a question that related to their everyday experiences, students could draw on their experiences and then through discussions develop the concept of organization of music, setting the foundation for learning about the concept of *genre*.

In the ALA protocol, which can be used across the content areas and grade levels, students are put in groups of four and then asked to respond to a prompt that is designed to allow them to tap into their own experiences. The central criterion for the prompt is that every student be able to write two sentences about it. The prompt needs to focus more on students' experiences and their everyday concepts and not as much on the central academic concept. When students write their two sentences on an index card, they become more aware of the concept they are writing about and, as they put their thoughts into written language, begin to make connections between their everyday concepts and the academic concept. In the process of writing about the organization of music in the example above, students had to think more deeply about the concept of organization, and then when they had to come up with rules, they stretched their everyday concepts upward to the general concept of *genre*.

Students whose native language is other than English can write their sentences in their native language to access the concept in their strongest language. After students have written two sentences, they talk with a partner in their group and create two new sentences on another color index card. In this interaction they help one another get additional perspectives on the concept, thereby expanding their everyday concepts upward. For example, for the prompt 'Time' an English learner wrote a sentence in Spanish and then wrote 'clocks and hour of day' in English. Her partner's sentence was, 'Time helps us keep track of the day.' After discussion, they came up with the sentence, 'A system in which days are divided into seconds, minutes, and hours past noon and midnight.' Kristin⁴ describes the effect of first writing and then discussing: 'My students have to think about the concept and their personal experiences with those concepts before sharing their ideas with others. Once students begin to share information with one another, their ZPDs are being expanded.'

When they have two new sentences, the two pairs in the group of four create two additional sentences on another color index card taking ideas from both pairs. 'Students began feeding off of one another's ideas and building off each other's language and vocabulary. The student with low vocabulary skills would borrow the language and

vocabulary being used by their peers to express their ideas. This borrowing increased the quantity and quality of academic language in my classroom' (LeAnn). Responding to the prompt 'Knowledge' three students, one of whom was an EL, used words like 'key,' 'opportunities,' and 'value' and in their combined sentences used words and concepts that they had not used in their initial sentences like 'appreciate' and 'ignorance closes doors.'

Creating an opportunity for dialogic interaction helped these students expand their understanding of the concept of knowledge. 'Just listening to their discussions as they collaborate lets me know that there is learning occurring, but most exciting is when they are actually 'teaching' each other' (Ruth). The two sentences that each group creates are copied onto poster paper and displayed for the whole class. After the teacher has read each of the groups' contributions, each member of the class votes for which response, other than their own group's, best captures the essence of the prompt. This process helps students develop the academic thinking skills – analysis, comparison, contrasting, synthesis, evaluation – needed to access academic concepts. 'The engagement in the discourse in the protocol creates internal motivation to possess and use strong language skills. Students want to clearly express their ideas, both in writing and discussion, without any prompting from me, the teacher. It is empowering, in both terms of intellectual and emotional development' (Natalie). (The element of emotion that Natalie raises is an important one in consideration of interaction within the ZPD, one that we discussed in *The Gift of Confidence: A Vygotskian View of Emotions* (Mahn and John-Steiner 2002)). Once students have voted individually on a response, they try to reach consensus as a group, providing another opportunity for stretching their own concepts through dialogue.

The groups are then asked to discuss themes that run across the different responses, again helping to expand their understanding of the concept and seeing it in relationship to other concepts. This process is continued as students look at common vocabulary across the groups' responses. In this step the teacher discusses words that are central for conveying meaning, both the academic content words and also words like 'because,' 'if,' 'then' which are central to conveying concepts, but which are rarely discussed. Highlighting these logical connectors is especially helpful for English learners. Science and mathematics teachers reported that focusing on these words helped ELs understand cause and effect as well as word problems that often have the construction, 'If.....then....'

Pauline Gibbons, whose work helped guide the ALA project, has compared classroom language to a *window* through which content is viewed. This window is transparent for most students, but for second language learners it is like frosted glass, which makes it important for teachers to be 'aware of the language we use' and to 'deliberately create opportunities for children to hear and use it,' which means looking *at* language and not just *through* it (Gibbons 1993, p. 12). She is underscoring a central tenet in sociocultural theory, the role that semiotic mediation plays in the internalization of social interaction (Vygotsky 1987). Because language mediates our experiences in and understanding of the external world, if teachers are not aware of language use in the classroom, second language learners' academic achievement will suffer.

The final step in the ALA protocol is for the teacher to display two sentences of academic text related to the central concept of the unit. This text, which presents the academic concept, can be drawn from any number of sources: from the textbook for the course or other texts, from the Internet, or from the teacher. After reading it, the teacher asks the groups to find ideas in the students' sentences that appear in the academic text. This activity helps create dialogue that takes place between the students' everyday concepts and the academic concept, i.e. in the ZPD. It is also a source of pride for students as they see that they have raised similar ideas to the 'expert'. The academic text for the protocol initiated with the prompt 'Time' included the units for measuring time that also appeared in the students' sentences

along with the concepts of *past*, *present*, and *future*. It also introduced the concepts of *dimension*, *duration*, and *interval*, which did not explicitly appear in the students' sentences, but which were explained using the students' language as a jumping-off point.

Vygotsky (1987) argues that an important task for effective teaching based on the concept of the ZPD is for teachers to model the thinking and discourse necessary for students to access the academic concepts. At the end of the ALA protocol, teachers can model how to analyze academic text by revealing the thinking necessary to access the academic concept, by situating it in a system and relating it to subordinate and superordinate concepts. An effective way to make transparent one's thinking is by posing questions, the answers to which will help students more fully understand the academic concept in relation to their everyday concepts. In the unit initiated by the prompt 'Knowledge' the teacher posed the question to the class, 'What is the difference between *knowledge* and *understanding*?' In differentiating these two concepts, the students gained a deeper understanding of both. Making inquiry central to teaching/learning based on the ZPD also helps students pose questions that extend their everyday concepts toward academic concepts, because the questions often push them to go beyond what they already know. 'Because the ALA approach increases and supports students' inquiry and conceptual thinking, I have been able to successfully present students with learning challenges. The ALA protocol provides students a sense of 'intellectual autonomy' and self-esteem which are highly relevant to the English learners' achievement' (Natalie). Making the central concept accessible to students helps give them confidence and motivation throughout the unit, because 'students are less likely to give up or feel frustration when reading a text because the ALA approach lays the foundation for concepts presented in the text' (Natalie).

After doing the protocol, teachers are able to quickly get insights into students' understandings of a concept individually and as a class, and can gauge their everyday concepts by reviewing the sentences on the index cards on which students individually, in pairs, and in groups have put their initials. As Ruth describes, this helps to provide a foundation for the unit as a whole. 'This gives me much needed feedback in order to plan and implement my unit.'

While the ALA protocol is used to introduce a unit, aspects of it can and should be used throughout the unit to create opportunities for meaningful, engaging dialogic interaction between students and teachers. For example, there are a number of ways that writing can be used as a regular classroom routine across the curriculum. Instead of a teacher posing a question to the class as whole, and often having the same volunteers respond while the rest of the class sits in varied degrees of disengagement, the teacher can ask every student to write a one- or two-sentence response and then discuss it with a partner. In posing the question on the difference between *knowledge* and *understanding*, the teacher first had students individually write a couple of sentences and then share them with a partner as a foundation for the whole class discussion.

Often students are more effective in explaining a concept to their peers because they may have had similar experiences and are using the same mode of thinking, i.e., thinking in complexes. Having students write and talk regularly engages all of the students and sets the foundation for a more meaningful whole-class discussion. The teacher now has an opportunity to discuss the concept based on the students' responses using their language, but also introducing the academic words and phrases that will help students understand the concept and extend their zones of proximal development. This can help to bring about a shift in a teacher's attitude toward classroom discourse. 'The shift in discourse with students took place when I began to analyze 'incorrect' answers. Instead of moving on when an answer was incorrect, I used this as a learning opportunity and found myself genuinely interested in why the student answered incorrectly. I want to understand where their answer came from; therefore, I would follow their incorrect answer with another question'

(LeAnn). The concept of a shift ran through the reflections of many teachers in the ALA project as they raised questions about themselves as teachers, about their students, about the content, about the mandated curriculum. In describing her transformation in teaching focused on the students and their conceptual understanding rather than just the acquisition of knowledge, Paula captured what many teachers expressed: 'It has been eye-opening and very encouraging to see students use their background knowledge to express themselves and participate in conversations and activities all leading to conceptual understanding.'

7. Conclusion

This chapter has given a brief overview of Vygotsky's work as a whole by focusing on one concept, the ZPD, and through an analysis of it, revealing fundamental concepts in Vygotsky's theoretical framework. It has made the argument that a key aspect of Vygotsky's use of the concept of the ZPD is to analyze the relationship between everyday concepts and academic concepts and, that by analyzing this relationship, one gains an understanding of the transformation of thinking in complexes to thinking in concepts. This transformation is not automatic but is facilitated if teachers understand how the ZPD illuminates the nature of the transformation. With this understanding teachers can plan teaching/learning activities that are appropriate to where students are in their conceptual development. Students and teachers can then use classroom interaction and discourse to expand learning so that students gain conceptual understandings and are able to use these understandings to problem-solve in contexts different from the ones in which the concept was learned. Teachers experience a concomitant sense of efficacy as they see their revised approaches yielding growth in the conceptual understanding of their students.

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NOTES

- 1 Vygotsky uses both 'spontaneous' and 'everyday' to describe concepts children acquire at a very early age based on their interactions with the physical and social environment. I use 'everyday' because 'spontaneous' loses the element of social interaction in forming these concepts. The Russian term *nauchnoe ponjatie* has been most widely translated as 'scientific concept' even though it does not clearly describe the concept behind the term. Vygotsky used it to refer to the concepts organized into systems that students encounter in school, so following van der Veer and Valsiner (1994, p. 369) I use 'academic' in this chapter.
- 2 The Russian word *obuchenie*, which means both teaching and learning, has been translated in English as 'instruction,' but since it does not convey its real meaning and connotes a teacher-dominated approach, I use 'teaching/learning' instead.
- 3 'English learner' means any student whose native language is other than English.
- 4 The quotes in this section come from the reflections of teachers who went through the ALA project and used the ALA protocol as a regular feature of their teaching.

REFERENCES

- Aljaafreh, A. and Lantolf, J.P. (1994) Negative feedback as regulation and second language learning in the zone of proximal development. *The Modern Language Journal*, 78, 465–483.
- Chaiklin, S. (2003) The ZPD in Vygotsky's analysis of learning and instruction, in *Vygotsky's Educational Theory in Cultural Context* (eds A. Kozulin, B. Gindis, V. Ageyev, and S.M. Miller), Cambridge University Press, Cambridge UK, pp. 39–64.
- Chaiklin, S. and Hedegaard, M. (2013) Cultural-historical theory and educational practice: Some radical-local considerations. *NUANCES: Estudos sobre Educação*, 25 (1), 30–44.
- de Guerrero, M.C.M. and Villamil, O. (2000) Activating the ZPD: Mutual scaffolding in L2 peer revision. *The Modern Language Journal*, 84, 51–68.
- DiCamilla, F.J. and Anton, M. (1997) The function of repetition in the collaborative discourse of L2 learners: A Vygotskian perspective. *The Canadian Modern Language Review*, 53, 609–633.
- Gibbons, P. (1993) *Learning to Learn in a Second Language*, Heinemann, Portsmouth NH.
- Donato, R. (1994) Collective scaffolding in second language learning, in *Vygotskian Approaches to Second Language Research*, (eds J.P. Lantolf and G. Appel), Ablex, Norwood NJ, pp. 33–56.
- Hedegaard, M. (1990) The ZPD as basis for instruction, in *Vygotsky and Education: Instructional Implications and Applications of Sociocultural Psychology*, (ed. L.C. Moll), Cambridge University Press, New York, pp. 349–371.
- Hedegaard, M. (2003) Cultural minority children's learning within culturally-sensitive classroom teaching. *Pedagogy, Culture and Society*, 11 (1), 133–152.
- Hedegaard, M. and Chaiklin, S. (2005) *Radical-local Teaching and Learning*, Aarhus University Press, Aarhus, Denmark.
- John-Steiner, V. and Mahn, H. (1996) Sociocultural approaches to learning and development: A Vygotskian framework. *Educational Psychologist*, 31 (3/4), 191–206.
- Kozulin, A. (1990) *Vygotsky's Psychology: A Biography of Ideas*, Harvard University Press, Cambridge MA.
- Lantolf, J. P. (ed.) (2000) *Sociocultural Theory and Second Language Learning*, Oxford University Press, Oxford.
- Lantolf, J.P., and Appel, G. (1994) (eds) *Vygotskian Approaches to Second Language Research*, Ablex, Norwood NJ.
- Lantolf, J. and Beckett, T. (2009) Research timeline: Sociocultural theory and second language acquisition. *Language Teaching*, 42 (4), 459–475. Available at: https://www.academia.edu/4070205/Lantolf_and_Beckett_2009_-_Research_Timeline_Sociocultural_Theory_and_SLA
- Lantolf, J.P. and Poehner, M.E. (eds) (2008) *Sociocultural Theory and the Teaching of Second Languages*, Equinox, London.
- Lantolf, J.P. and Thorne, S.L. (2006) *Sociocultural Theory and the Genesis of Second Language Development*, Oxford University Press, Oxford.
- Mahn, H. (2003) Periods in child development: Vygotsky's perspective, in *Vygotsky's Educational Theory in Cultural Context*, (eds A. Kozulin, B. Gindis, V. Ageyev, and S. M. Miller), Cambridge University Press, New York, pp. 119–137.
- Mahn, H. (2012) Vygotsky's analysis of children's meaning making processes. *International Journal of Educational Psychology*, 1 (2), 100–126. Available at: <http://www.hipatiapress.info/hpjournals/index.php/ijep/article/view/289> DOI: 10.4471/ijep.2012.07
- Mahn, H., Bruce, M., and Adams, L. (2010) Our teaching: Academic literacy for all. *New Mexico English Journal*, (Fall), 3–14. Available at: http://www.academia.edu/3012279/OUR_TEACHING_Academic_Literacy_for_All
- Mahn, H., and John-Steiner, V. (2002) The gift of confidence: A Vygotskian view of emotions, in *Learning for Life in the 21st Century: Sociocultural Perspectives on the Future of Education*, (eds G. Wells and G. Claxton), Blackwell, Cambridge MA, pp. 46–58.
- Tharp, R. and Gallimore, R. (1988) *Rousing Minds to Life*, Cambridge University Press, New York.
- Thorne, S.L. (2003) Artifacts and cultures-of-use in intercultural communication. *Language Teaching and Technology*, 7, 38–67.
- van der Veer, R. and Valsiner, J. (1991) *Understanding Vygotsky: A Quest for Synthesis*. Blackwell, Cambridge MA.
- van der Veer, R. and Valsiner, J. (1994) *The Vygotsky Reader*, Blackwell, Cambridge MA.

- Vygotsky, L.S. (1978) *Mind in Society: The Development of Higher Psychological Processes*, Harvard University Press, Cambridge MA.
- Vygotsky, L.S. (1987) *Problems of General Psychology. The Collected Works of L.S. Vygotsky: Vol. 1. Including the volume Thinking and Speech*, Plenum, New York.
- Vygotsky, L.S. (1997) *The History of the Development of Higher Mental Functions. The Collected Works of L.S. Vygotsky: Vol. 4. Problems of the Theory and History of Psychology*, Plenum, New York.
- Vygotsky, L.S. (1998) *Child Psychology. The Collected Works of L.S. Vygotsky: Vol. 5. Problems of the Theory and History of Psychology*, Plenum, New York.
- Wells, G. (1999) *Dialogic Inquiry: Towards a Sociocultural Practice and Theory of Education*, Cambridge University Press, New York.
- Wertsch, J. (1985) *Vygotsky and the Social Formation of Mind*, Harvard University Press, Cambridge MA.
- Wong Fillmore, L. (1982) Instructional language as linguistic input: Second-language learning in classrooms, in L.C. Wilkinson (Ed.), *Communicating in the Classroom*, Academic Press, New York, pp. 283–296.

CROSS REFERENCES

See Chapter 2: The Role of Talk in Group-Based Activity in Language Classrooms.

See Chapter 14: From Inter-Action to Intra-Action: The Internalization of Talk, Gesture, and Concepts in The Second Language Classroom.

See Chapter 16: The Emergence of Sociolinguistic Competence in Second Language Classroom Interaction.

See Chapter 17: Expert-Novice Relationships in Second Language Classroom Interaction.