Center for
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Exploratory Seminar:

Measurement Challenges Within the Race to the Top Agenda

December 2009

Assessment for Teaching and Learning

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Assessment for Teaching and Learning

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This paper was presented by Margaret Heritage at the Exploratory Seminar: Measurement Challenges Within the Race to the Top Agenda, December 2009. Download copies of other papers presented at the seminar at http://www.k12center.org/publications.html.

Assessment has two essential purposes: to provide information on students' current levels of achievement and to inform what teachers do in classrooms to ensure that students make progress toward desired outcomes. The first purpose has received a good deal of consideration in recent years, especially in accountability contexts where measuring student achievement in relation to state standards has been of primary importance. Notwithstanding its centrality to effective practice in the classroom, the second purpose has attracted rather less attention. The default assumption has apparently been that teachers will determine what needs to be done next to move learning forward, using the assessment information about students' present achievement levels. This is an assumption that has inherent problems.

Vygotsky remarked that "the only good kind of instruction is that which marches ahead of development and leads it; it must be aimed not so much at the ripe as at the ripening functions" (Vygotsky, 1986, p. 188). In this paper, I consider how, in addition to the *ripe functions* that are the focus of most current assessment approaches, assessment information could provide insights about learners' *ripening functions*. First, I describe how teachers assist the process of learning. I then discuss the inbuilt problems of measures of present performance as resources for teachers in promoting learning, and how assessments could be designed to be more useful. Next, I present a framework for an instructionally supportive assessment system that incorporates measures for determining students' present performance and their ripening functions. Finally, I discuss the implications for teachers that such a framework would entail.

Assisting the Learning Process

Because no one else can learn for them, the learning process is the property of students. The role of teachers is to assist the process, which they do through a variety of means.

First, teachers invite student participation in learning by clarifying the learning goals that are to be accomplished, often collaborating with students in the development of the goals. Second, they structure new student experiences incrementally and, through planned interactions with students, make connections between prior and new learning. Third, teachers provide feedback to students during the course of their learning that helps develop metacognition and self-regulation skills. This feedback indicates to students where they are in relation to the learning goal and contributes to strategies for

how students can move forward in their learning. Finally, teachers support students in developing their own self-monitoring skills so that they can make adjustments to learning when needed to keep on track and meet the learning goals.

If the second purpose of assessment—to inform what teachers do in classrooms to ensure that students make progress toward desired outcomes—is to be fulfilled, then assessment information should support teachers in assisting learning in all of these ways. But does it? In the following section, I discuss the limitations of current assessments with regard to supporting teaching and learning.

Current Situation of Assessments to Assist Learning

Current Assessment Is Retrospective

The first problem with the current assessment situation for assisting learning is that the vast majority of existing assessments measure present performance. They measure the ripe functions, what *"has already matured to the present day"* [italics added] (Vygotsky, 1933/1935, p. 120). The intention of these assessments is to determine, as closely as possible, what students can do on their own. By characterizing development retrospectively, they represent a past-to-present model of assessment. From information about the student's present state, teachers have to overcome "the present state of being through a process of relying on presently existing psychological functions in the service of developing novel ones" (Valsiner & Van der Veer, 1993, p. 38). Because retrospective assessments do not provide teachers with indications about maturing psychological functions, they present less than optimal guidance for assisting learning.

Current Assessment Is Static

The second problem with current assessments is that they are mostly static. Sternberg and Grigorenko (2002) nicely captured the limitations of static assessment when they note:

> The examiner presents items, either one at a time or all at once, and each examinee is asked to respond to these items successively, without feedback or intervention of any kind. At some point in time after the examination is over, each examinee receives the only feedback he or she will get: a report card or a set of scores. By that time the examinee is studying for one or more future tests. (p. vii)

When teachers receive retrospective information from static assessments—mainly in the form of scores—they routinely find that they have insufficient feedback to assist learning. Scores (from state, benchmark/interim assessments, and many curriculum-embedded assessments) lead teachers to the determination that students did or did not learn what they were supposed to. When the scores indicate that students have met the expectation, teachers typically move on to the next topic, chapter, unit, standard, and so on. If they did not meet the expectation, then review or re-teaching strategies are

employed. In all instances, the ripening functions are underrepresented because, by their very nature, the assessment evidence is devoid of information about the next step within the student's reach.

Some current assessments are designed to provide more information for teachers than a numerical score. For example, a number of curriculum-embedded assessments identify student misconceptions or levels of understanding in relation to a concept, give teachers information about the nature of the misconception, and suggest what they might do in response. These represent better alternatives than most of the assessments described above, but still fall short of being maximally useful for teachers. Although they identify misconceptions with suggestions for how to clear them up, they do not often indicate where to go next (i.e., the next point of learning that is within the student's reach) once the misconception has been rectified.

As Fred Erickson recently noted, "for too long we have looked upstream at what has been learned. Assessment needs to look downstream at what *can be learned*" (F. Erickson, personal communication, 28 October, 2009). While some functions of assessment—for example, accountability, placement, and certification—require past-to-present models, instruction, by contrast, requires present-to-future models. Instead of the current situation where past-to-present models dominate the assessment landscape, for assessment to be maximally useful to assist learning, present-to-future models need to share the terrain.

In the next section, I consider dynamic, present-to-future models of assessment and how they can assist learning.

Assessment to Assist Learning

The Zone of Nearest Development

For the purpose of assisting learning in the ways described earlier, teachers need an indication of the *zone of nearest development.* This refers to "those processes in the development of the same functions, which, as they are not mature today, still are already on their way, are already growing through, and already tomorrow will bear fruit" (Vygotsky, 1933/1935, p. 120). The zone of nearest development, also termed the *zone of proximal development* (ZPD), characterizes development prospectively (Bransford, Brown, & Cocking, 2000; Vygotsky, 1978).

Black and Wiliam (2009), citing Chaiklin (2003), stressed that Vygotsky made a careful distinction between learning and development. Development requires changes in the fundamental psychological functions available to the learner, while learning involves acquiring new dependent mental capabilities, without changes in the underlying psychological functions. The ZPD, therefore, is not

> …just a way of describing what a student can do with support, which might be simply learning, it is the description of the *maturing* [emphasis added] psychological functions rather than those that already exist. A focus on the *maturing* [emphasis added] psychological functions is most likely to produce a transition to the next developmental level. (Black & Wiliam, 2009, p. 19).

Present-to-future models of assessment that indicate the maturing functions and what learning is within a student's reach present the opportunity for teachers to lead development.

Present-to-Future Models

In present-to-future models of assessment, the concern is not solely with the level of actual performance, but with anticipating future possibilities (i.e., the ZPD). In this vein, Vygotsky (1978) argued that independent performance to determine a person's actual level of development does not cover the whole picture of development. Instead, he stressed the importance of responsiveness to mediation, which, because it provides insight into an individual's future development, is essential to understanding cognitive ability.

In present-to-future models of assessment, the question to be answered is not "What can the student do alone?" but rather, "How does the student respond to assistance?" To enable the latter question to be answered requires a shift from the kind of static assessment described earlier to a more dynamic version. Such assessments would provide windows into future development through a process of assisted performance. This involves presenting students with a task, then a + 1 assist, a + 2 assist, and so on until they reach the point when they could go no further with assistance, identifying the outer limit of potential performance. The assessment results would characterize the region of tasks between what the learner could accomplish alone and what could be accomplished and ultimately mastered with assistance. With this kind of information, teachers would have clear indications of where to match instruction to extend learning.

For example, teaching students to integrate and use a variety of comprehension strategies to understand texts is a goal of reading teachers. Suppose that in addition to an assessment designed to test this skill without assistance, the assessments helped teachers understand which of the strategies students could use with varying degrees of assistance. Perhaps with assistance the student could integrate the strategies of using syntactic cues with graphophonic cues—a + 1 assist. Then, the assessment could move to a + 2 assist, showing that the student was able to integrate syntactic cues and graphophonic cues, but not semantic cues. This assessment design would provide an indication of the outer limit of potential. With this information, the teacher could focus on helping the student to integrate two of the cues so that he or she could ultimately do so without assistance. Thus, the skill becomes part of the student's independent achievement. Similarly, an assessment of the use of inference skills might scaffold students' use of inference up to the point when they have reached their outer level—for example, inferring the motives of characters that drive plot development. Again, this information would provide the focus for assisting the next step in learning.

Dynamic Assessment

The mediated assessment approach described above has its roots in dynamic assessment (DA). Originating in the work of Vygotsky and Feuerstein, DA rests on four assumptions: (a) accumulated knowledge is not the best indication of ability to acquire new knowledge; (b) individuals function at less than 100% of capacity; (c) the best test of any performance is a sample of that performance; and (d)

when obstacles that could mask performance are removed, greater ability than was suspected is often revealed (Haywood & Tzuriel, 2002). Offering assistance during the course of the assessment administration will often not only give an indication of the student's potential for new knowledge, but will also likely remove probable obstacles, revealing what the student is capable of learning.

There are some current attempts at dynamic assessment. For example, a number of assessments analyze student responses and replicate teachers' on-target assistance, with correct answers leading to more difficult material and incorrect answers prompting less difficult items until the level of performance is stable. Returning to the dimensions of teachers' assistance for learning discussed at the beginning of this paper, such assessments still fall short of giving teachers the information they need to structure new experiences for in-depth learning, to plan and engage in extended interactions that enable students to learn from the experiences, and to support metacognition activity. If assessment information were to give teachers clearer indications about the students' ZPD, teachers could more effectively plan for learning and provide students with feedback about their learning and what they need to do to move forward, which in turn supports metacognition and self-regulation.

An Assessment System to Support Teaching and Learning

As stated earlier, most current assessments determine what students can do by themselves and are thus useful for accountability and progress monitoring purposes, but are of much less use for identifying a student's ZPD. In what follows, I consider an assessment system that could serve the purpose of providing information about achievement levels *as well as* information about the ZPD that teachers can use to assist learning. It is essential that such a system is constructed on sound descriptions of learning, and it is to that point I turn first.

Descriptions of Learning

In *Knowing What Students Know (KWSK),* a committee of the National Research Council, synthesizing decades of research in cognition, measurement, and psychometrics, advanced an ambitious vision for a system of assessment based on three critical principles: coherence, comprehensiveness, and continuity (Pellegrino, Chudowsky, & Glaser, 2001):

- A *coherent* assessment system is built on a well-structured conceptual base—an expected learning progression, which serves as the foundation of all assessments and identifies important targets for instruction and assessment.
- A *comprehensive* assessment system provides a variety of evidence to support educational decision making.
- A *continuous* assessment system is temporally aligned and provides "indications of student growth over time . . . akin more to a videotaped record than to the snapshots provided by the current system of on-demand tests" (Pellegrino et al., 2001, pp. 256-257).

In addition, citing Mislevy (1994, 1996), the authors of *KWSK* referred to assessment as a process that involves teachers and others in reasoning from evidence, representing this process as a triangle composed of three elements: cognition, observation, and interpretation.

Cognition refers to a well-constructed conceptual base that lays out how students develop knowledge and competence in the domain. The observation corner of the triangle represents the specifications for assessment tasks, which must provide evidence that is linked to the cognitive models of learning and support the inferences and decisions that will be made based on the evidence. The interpretation corner of the triangle refers to all the methods and tools used to reason from observations.

With this model underpinning assessment design and use, *KWSK* conceives of a situation where assessments (referred to as observations) at various levels of detail or grain size, depending on the context, are aligned across an expected trajectory of development from novice to expert performance.

Research on novice-expert performance, and on what constitutes expertise in a domain, has helped to define the characteristics of knowledge and thought at advanced stages of learning and practice (e.g., Chase & Simon, 1973; Chi, Bassok, Lewis, Reimann, & Glaser, 1989; Chi, Feltovich, & Glaser, 1981; Ferrari & Chi, 1998; Glaser, 1984; Larkin, McDermott, Simon, & Simon, 1980; Newell, 1990). This body of research tells us that experts have extensive stores of knowledge and skills, and, most importantly, they have efficiently organized this knowledge into tightly connected schemata. Schemata enable learners to apply what they have learned in a new situation and to acquire related new learning more quickly (Pellegrino, 2006).

As long ago as 1960, Jerome Bruner argued that:

> The teaching and learning of structure, rather than the simple mastery of facts and techniques, is at the center of the classic problem of transfer . . . if learning is to render later learning easier, it must do so by providing a general picture in terms of which the relations between things encountered earlier and later are made as clear as possible. (Bruner, 1960, p. 12)

Bruner advocated that early teaching of any subject should emphasize grasping ideas intuitively, and these ideas should be continually revisited, increasing in complexity until they are fully understood:

> I was struck by the fact that successful efforts to teach highly structured bodies of knowledge like mathematics, physical sciences, and even the field of history, often took the form of metaphoric spiral in which at some simple level a set of ideas or operations were introduced in a rather intuitive way and, once mastered in that spirit, were then revisited and reconstrued in a more formal or operational way, then being connected with other knowledge, the mastery at this stage then being carried one step higher to a new level of formal or operational rigor, and to a broader level of abstraction and comprehensiveness. The end stage of this process was eventual mastery of the connexity and structure of a large body of knowledge. (Bruner 1960, p. 3-4)

Recent summaries of cognitive research have stressed the importance of learners acquiring connected knowledge that is organized around the foundational ideas of a discipline (e.g., Donovan & Bransford, 2005).

Learning progressions lay out the important ideas, principles, and skills of the domain in a sequence that represents how competence in a domain develops. Each idea and skill is connected to the previous and successive one so that the progression describes how competence begins with rudimentary understandings and skills and progressively increases in sophistication toward acquiring expertise in a domain (Heritage, 2009).

An Assessment Framework

Table1 describes a framework for a system of assessment built on a learning progression that supports the development of schemata within a domain.
The system has three different levels of assessment operating within different assessment cycles and all constructed on the same model of learning, that is, a learning progression.

The focus of Level 1 is a student's milestone performance. Milestones are critical points along the learning progression of the schemata students construct as they move toward increasing expertise in the domain. These assessments operate within a long cycle, a period of instruction spanning months or even longer than a year, depending on the complexity of the schemata.

Milestone assessments measure students' use of knowledge and skills in novel situations (assessing networks of schemata) and provide extended opportunities to represent this knowledge and these skills. Student representations are in various formats and can be stored digitally, including the use of video and audio. The measures indicate the degree of consolidation of learning and serve two purposes: accountability and progress monitoring.

Assessment scoring is conducted through a process of expert sampling and teacher moderation[1], with the use of performance descriptors to determine the levels of consolidation.

Level 2 assessments in the framework occur within a medium cycle, for example, frequent assessment based on teacher judgment of when assessments should be administered to provide timely information to keep learning moving forward. The focus of these assessments is the subschemata—the underlying components of the schemata (see Anderson, Reder, & Simon, 1998), which interact to enable competent performance (see Resnick & Resnick, 1992). Through a process of assisted performance described earlier, these assessments indicate to both teachers and students the outer limit of potential

[1] Teacher moderation has been used in high-stakes testing in the United Kingdom and Australia and is currently being considered in Norway.

Table 1. ***Assessment Framework***

Level	Focus	Purpose	Cycle	Description	Scoring
1	Milestone performance (schemata/skills)	Accountability; consolidation of learning	*Long*: a period of instruction spanning months or even longer than a year, depending on complexity of concept/skills	Use of knowledge and skills in novel situations (assessing networks of schemata) Extended opportunities to represent knowledge and skills Digital collection of artifacts, including audio, video	Performance descriptors for teacher moderation—levels to show the extent of consolidation In addition, expert sampling for accountability
2	Developing subschemata/ skills	To determine the student's ZPD	*Medium:* frequent assessment based on teacher judgment of when to administer and/or embedded in curricular units	Assisted performance + 1, + 2, etc.	Teacher and student determine outer limit of performance Use of technology to administer
3	Scaffolds/probes linked to medium cycle	To keep learning moving forward in the ZPD	*Short*: used while students are learning	Assisted performance decreasing	Teachers and students interpret performance based on what the students are able to do unassisted and where they still need assistance Teachers make adjustments to teaching and learners to learning along the way Interaction between teacher and students and among students

performance, in other words, the ZPD. Technology is the medium through which the assessments are administered, and teachers and students together discuss the results so that the student is just as aware as the teacher of the region in which future learning needs to take place and what needs to be done to move forward.

The third level of the framework comprises short-cycle assessments: questions and probes for teachers to use while supporting learning in the ZPD. The questions and probes provide teachers with the combination of scaffolding and formative assessment strategies they can use to keep moving learning forward in the ZPD. As in the Level 2 assessments, these strategies can be used to provide feedback and support metacognition activity and self-regulation. The upper boundaries of learning potential will change as the student moves to independent competence, and teachers will decide when to administer the medium-cycle assessments to determine the next ZPD.

Clearly, what is represented in Figure 1 is at some distance from current assessment systems. The idea of learning progressions is an emerging one. There are few progressions in existence, and the ones that have been developed need to undergo a process of validation. The assessment tasks envisioned in the framework, both to assess milestone performance and to determine the students' ZPD, will require those who design assessments to think differently about learners' development and how to reveal the level of students' schemata. Present-to-future models of assessment will also require psychometricians to devise ways to establish their technical quality.

The role that teachers play in the proposed system is a far cry from the role they currently play and will demand greater (and desirable) levels of expertise. However, it is my belief that the assessment system I have described here can have far-reaching benefits to students, because it will give teachers the necessary support to effectively assist learning. In the section following, I discuss more fully the implications of this system for teachers and the steps that could be taken to make it a reality.

Implications for Teachers

The proposed assessment system would require an investment in the development of teacher knowledge and skills (Heritage, 2010).

Teacher Knowledge and Skills

First, teachers would need to have better conceptions of what it means to develop competence in a domain. They would need to be clear about how learners construct schemata of increasing complexity as they move from rudimentary to progressively more sophisticated understanding within the domain. Learning progressions would be an important step in helping augment teachers' knowledge in this area.

Second, teachers would need to more fully understand that teaching and learning are functionally interdependent with the developmental processes that are emerging but have yet to become established (Valsiner & Van der Veer, 1993). This will require a change from the prevailing "got it, didn't get it, review, or re-teach" orientation to one where teachers are concerned with conceptualizing and identifying ripening functions and building on them so that they reach a mature stage. Integral to the

latter orientation is an understanding of how to structure experiences within the student's ZPD with incremental decreases in assistance until the functions are ripe and the once assisted performance becomes part of the student's own independent achievement.

Third, teachers will need the skills to use assessment information seamlessly with instruction so that scaffolds to support learning (Level 3 of the framework) are also used as windows into student thinking. A necessary component of this skill is the ability to be responsive to student learning during the course of instruction so that when adjustments to teaching and/or learning are needed to keep learning on track toward desired goals, the teacher can take the appropriate action.

Finally, executing the skills described above is heavily dependent on a depth of content-based pedagogical knowledge, which includes and understanding of both how learners develop expertise in the domain and how to support learners in the development of expertise.

Systems to Support Teacher Knowledge

For the most part, the current system of professional training does not produce teachers with the level of knowledge and skills needed to implement the proposed assessment framework. Indeed, a radical overhaul is needed to create a professional workforce with the skills to use assessment information to assist learning.

A first step in improving teacher knowledge is the creation of learning progressions that can assist teachers in developing models of how students' thinking and skills develop in a domain. Learning progressions would be the foundation of all assessment, irrespective of grain size. Assessments mapped to the progression would provide actionable information to assist learning.

In terms of the content of the pre-service and in-service programs and ongoing professional communities, much more attention needs to be given to *learning* so that the focus of all teachers' actions is how to assist learning rather than what to teach, which seems to be the dominant perspective and leads to the current emphasis on content coverage. In combination with a learning progression, a focus on learning would more readily enable teachers to understand the ZPD and where students need to go next to construct increasingly complex schemata within a domain. It would also lead to a clearer view of teaching as building on students' emerging or ripening functions.

The proposed assessment framework would also require changes in how teachers regard students in the assessment process. Establishing the ZPD—Level 2 assessments—and supporting learning within the ZPD—Level 3 assessments—involves the student as well as the teacher. This will represent a considerable shift for many teachers from having all of the responsibility for learning residing with them to one where the students become collaborators who develop and use metacognition and self-regulation skills. Professional education and training will need to take full account of this required shift.

Finally, teacher moderation of Level 1assessment results will require training, especially with regard to understanding performance criteria and managing comparability of judgment among teachers. While the training effort may be considerable, the benefits to the development of teacher knowledge and skills, and student learning, cannot be overstated.

Conclusion

In this paper, I have aimed to describe what is involved in assisting student learning, presented an assessment framework designed to support teachers in this process, and considered some of the implications of the framework for the role of teachers and for their professional education and training. It is clear that current past-to-present methods of assessment are of little benefit in the day-to-day scaffolding of student learning. It is also clear that formative assessment methods, in conjunction with the formulation and implementation of learning progressions, is a promising means of moving practice of teaching and learning forward in the 21st century.

References

Anderson, J. R., Reder, L. M., & Simon, H. A. (1998). Radical constructivism and cognitive psychology. In D. Ravitch (Ed.), *Brookings papers on education policy 1998* (pp. 227-278). Washington, DC: Brookings Institute Press.

Black,P., & Wiliam W (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability, 21,* 5-31.

Bransford, J. D., Brown, A. L., & Cocking, R. R (Eds.). (2000). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academies Press.

Bruner, J. (1960). *The process of education*. Cambridge, MA: Harvard University Press.

Chaiklin, S. (2003). The zone of proximal development in Vygotsky's analysis of learning and instruction. In A. Kozulin, B. Gindis, V. S. Ageyev, & S. M. Miller (Eds.), *Vygotsky's educational theory in cultural context* (pp. 39-64). Cambridge, MA: Cambridge University Press.

Chase, W. G., & Simon, H. A. (1973). Perception in chess. *Cognitive Psychology, 4*, 55-81.

Chi, M. T. H., Bassok, M., Lewis, M., Reimann, P., & Glaser, R. (1989). Self-explanations: How students study and use examples in learning to solve problems. *Cognitive Science, 13*, 145-189.

Chi, M. T. H., Feltovich, P., & Glaser, R. (1981). Categorization and representation of physics problems by experts and novices. *Cognitive Science, 5,* 121-152.

Donovan, M. S., & Bransford, J. D. (2005). Introduction. In M. S. Donovan & J. D. Bransford (Eds.), *How students learn: History, mathematics, and science in the classroom* (pp. 1-28). Washington DC: National Academies Press.

Ferrari, M., & Chi, M. T. H. (1998). The nature of naive explanations of natural selection. *International Journal of Science Education, 20,* 1231-1256.

Glaser, R. (1984). Education and thinking: The role of knowledge. *American Psychologist, 39,* 93-104.

Haywood, H. C., & Tzuriel, D. (2002). Applications and challenges in dynamic assessment. *Peabody Journal of Education, 77*(2), 40-63.

Heritage, M. (2009, November). *The case for learning progressions.* San Francisco, CA: The Stupski Foundation.

Heritage, M. (2010). *Formative assessment: Making it happen in the classroom.* Thousand Oaks, CA: Corwin Press.

Larkin, J., McDermott, J., Simon, D. P., & Simon, H. A. (1980). Expert and novice performance in solving physics problems. *Science, 208*, 1335- 1342.

Mislevy, R. J. (1994). Evidence and inference in educational assessment. *Psychometrika, 59*, 439-483.

Mislevy, R. J. (1996). Test theory reconsidered. *Journal of Educational Measurement, 33*, 379-416.

Newell, A. (1990). *Unified theories of cognition*. Cambridge, MA: Harvard University Press.

Pellegrino, J. W. (2006). *Rethinking and redesigning curriculum, instruction, and assessment: What contemporary research and theory suggests*. Retrieved from http://www.skillscommission.org/pdf/commissioned_papers/Rethinking%20and%20Redesigning.pdf.

Pellegrino, J. W., Chudowsky, N., & Glaser, R. (Eds.). (2001). *Knowing what students know: The science of design and educational assessment*. Washington, DC: National Academies Press.

Resnick, L. B., & Resnick, D. P. (1992). Assessing the thinking curriculum: New tools for educational reform. In B. R. Gifford & M. C. O'Connor (Eds.), *Changing assessments: Alternative views of aptitude, achievement and instruction*. Boston, MA: Kluwer.

Sternberg, R. J., & Grigorenko, E. L. (2002). *Dynamic testing: The nature and measurement of learning potential.* Cambridge, England: Cambridge University Press.

Valsiner, J., & Van der Veer, R. (1993). The endcoding of distance: The concept of the zone of proximal development. In R. Cocking & K. A. (Eds.), *The development and meaning of pyschological distance*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Vygotsky, L. S. (1933/1935). *Umstvennoie razvitie detei v protsesse obuchenia.* Moscow, Russia: Gosudarstvennoie Uchebno-pedagogicheskoie Izdatel 'stvo.

Vygotsky, L. S. (1978). *Mind and society: The development of higher mental processes.* Cambridge, MA: Harvard University Press.

Vygotsky, L. S. (1986). *Thought and language.* Cambridge: Massachusetts Institute of Technology Press