

Vygotskian preschool education: Promoting the development of self-regulation and symbolic thought in pre-K children

Educação pré-escolar vygotskiana: promovendo o desenvolvimento da autorregulação e do pensamento simbólico em crianças pré-escolares

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ABSTRACT

The Vygotskian preschool education program (VPEP) is built around mediation in the context of preschool age-specific activities such as sociodramatic play, constructive play, listening and retelling fairy tales, playing with dollhouses, motor activities, and some others. We used the VPEP as part of the daily curriculum in two pre-K classes at PS 197 in Harlem, New York, to promote the development of children's self-regulation and symbolic thought. Another pre-K class at PS 197 was used as the control group. For pre- and posttests, we administered the Coding and Symbol Search subtests of the Wechsler Preschool and Primary Scale of

RESUMO

O programa de educação pré-escolar vygotskiana (VPEP) é construído em torno da mediação no contexto de atividades específicas da idade pré-escolar, como brincadeiras sociodramáticas, brincadeiras construtivas, ouvir e recontar contos de fadas, brincar de casinha de bonecas, atividades motoras e outras. Usamos o VPEP como parte do currículo diário em duas turmas de pré-escola no PS 197 no Harlem, Nova York, para promover o desenvolvimento da autorregulação e do pensamento simbólico das crianças. Outra classe pré-K no PS 197 foi usada como grupo de controle. Para pré e pós-testes, foram administrados os subtestes Coding e Symbol

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Intelligence–III (WPPSI-III), which target the ability to self-regulate, and the Block Design subtest of the WPPSI-III, which targets the ability to exercise symbolic thought. The results of the study demonstrate that the VPEP promotes the development of preschoolers' self-regulation and is beneficial for the development of their symbolic thought.

Keywords: Preschool education. Vygotsky. Mediation. Self-regulation. Symbolic thought.

Search da Wechsler Preschool and Primary Scale of Intelligence–III (WPPSI-III), que visam a capacidade de autorregulação, e o subteste Block Design do WPPSI-III, que visa a capacidade de exercitar o pensamento simbólico. Os resultados do estudo demonstram que o VPEP promove o desenvolvimento da autorregulação dos pré-escolares e é benéfico para o desenvolvimento de seu pensamento simbólico.

Palavras-chave: Educação pré-escolar. Vygotsky. Mediação. Auto-regulação. Pensamento simbólico.

The Vygotskian approach to preschool education

The Vygotskian approach to preschool education is based on Vygotsky's (1934/1986, 1978) general idea that the major determinant of children's learning and development is mediation—that is, the engagement of children in age-appropriate activities, such as emotional interaction in the first year of life, play-centered activities in the preschool years, school learning during middle childhood, and interaction with peers in adolescence. In the context of such activities, adults teach children new tools of thinking, problem-solving, and self-regulation. These tools are presented to children in the form of external devices; for example, a mother ties a string around her son's finger so that he will not forget to buy bread on his way home. As children increasingly master these tools, they are internalized and become internal mediators of children's mental processes (in the example above, the child starts using mental mnemonics as an internal memory tool).

Proceeding from this idea of Vygotsky's, his Russian followers have suggested that preschool education should be built around preschooler play-centered activities, and it should promote the development in children of those cognitive and metacognitive abilities that represent the major components of school readiness: self-regulation and symbolic thought (Bozhovich, 1968; Elkonin, 1978; Kravtsov & Kravtsova, 1987; Talyzina, 2001; Venger & Kholmovskaya, 1978).

Self-regulation

Research and observations by both Russian Vygotskians and Western psychologists have demonstrated that children's ability to self-regulate (e.g., to adjust their behavior to school rules and regulations, to follow directions, and to attend to the teacher's explanation) is extremely important for successful learning at school (Blair, 2002; Blair & Raver, 2015; Bozhovich, 1968; Elkonin, 1978; Normandeau & Guay, 1998; Talyzina, 2001; Venger & Kholmovskaya, 1978). The same conclusion has been reached by American educators. One of the major complaints of American elementary school teachers is that many children come to school with a very low level of self-regulation, which makes the process of teaching extremely difficult (Bodrova & Leong, 2007). The results of two surveys of American teachers "clearly indicate that kindergarten teachers are concerned with children's regulatory readiness for school activities rather than with more strictly cognitive and academic aspects of readiness" (Blair, 2002, p. 112). Self-regulation is described as an important target of preschool education in Bright Start: Cognitive Curriculum for Young Children (Haywood, Brooks, & Burns, 1992). In their analysis of the problem of promoting self-regulation in young children, Russian Vygotskians have proceeded from Vygotsky's (1981) idea that self-regulation is rooted in "regulation of others' behavior by means of the word" (p. 159). As a result of regulating others and being regulated by others by means of verbal tools, children increasingly master these tools and start using them for self-regulation: first, by talking aloud to themselves (so-called egocentric or private speech), and, later, when these tools become internalized, by giving themselves mental commands. Thus, engaging children in joint activities, in the context of which they monitor and regulate each other's performance, will promote the development of their self-regulation.

Symbolic thought

Both Vygotsky (1984/1998) and Piaget (1945/1962) viewed symbolic thought (i.e., the ability to solve problems mentally rather than manually through trial and error) as a major cognitive ability that develops during preschool years. This ability is especially important for successful learning at school, which requires that students master scientific knowledge presented to them in the form of abstract concepts, rules, and laws (Elkonin, 1978; Kravtsov & Kravtsova, 1987; Talyzina, 2001; Venger & Kholmovskaya, 1978). Vygotsky (1966/1976) held that the development of symbolic thought is heavily determined by children's use of external symbolic representations of objects and events: "separating words from things requires a pivot in the form of other things" (p. 547). For example, when a child is "riding" using a stick as a horse, "the stick becomes the pivot for detaching the meaning of 'horse' from a real horse" (Vygotsky, 1978, p. 98). Proceeding from this idea, Russian Vygotskians have suggested that engaging children in activities that require the use of object substitutes, drawings, plans, models, diagrams, and maps will be beneficial for the development of their symbolic thought (Elkonin, 1978; Venger & Kholmovskaya, 1978).

The above ideas have become the foundation for Leonid Venger and his team's development of an innovative preschool education program (Venger, 1986). This program is built around preschooler play-centered activities, such as, but not limited to, sociodramatic play, constructive play with the use of building blocks, listening to and retelling fairy tales, playing with dollhouses, and so on. The program has been successfully used in Russia for many years in preschool educational settings, and it has been shown to promote the development of children's self-regulation and symbolic thought (Venger, 1986). Selected activities from this program have been incorporated into the "Tools of the Mind" preschool and kindergarten curricula (Bodrova & Leong, 2007), which have been used in a number of educational settings in the US. Evaluative study of the developmental outcomes of the kindergarten version of "Tools of the Mind" has demonstrated that the curriculum is effective in promoting children's self-regulation (Blair & Raver, 2014). Evaluative data on the developmental

outcomes of the prekindergarten version of “Tools of the Mind,” however, are mixed. According to Diamond, Barnett, Thomas, and Munro (2007), this curriculum promotes prekindergarten children’s self-regulation, whereas Wilson and Farran’s (2012) later evaluation led to the conclusion that this curriculum was not any better in this respect than traditional preschool education. As for the contribution of “Tools of the Mind” to the development of children’s symbolic thought, it has never been directly evaluated.

Objective and design of the study

The major objective of this study was to evaluate the effectiveness of a Vygotskian preschool education for the development of self-regulation and symbolic thought in American preschoolers. Following a request from the administration of the preschool, we modified and adjusted selected activities from Venger’s (1986) program for preschool education, designed new activities, and combined these activities within a Vygotskian preschool education program (VPEP) to be used as part of the daily prekindergarten curriculum at this school (a detailed description of the VPEP is provided in the next section). PS 197 is a public elementary school located in Harlem, New York, that serves predominantly African-American and Hispanic populations; the majority of students are from families with low income, and some reside in shelters. The VPEP was used in two prekindergarten classes (“Vygotskian group”; 18 children in total). Another prekindergarten class in this school (12 children in total) was used as the control group; the children in this class enjoyed the regular academic-centered daily preschool curriculum.

To evaluate the effectiveness of the VPEP, we used the Coding and Symbol Search subtests of the Wechsler Preschool and Primary Scale of Intelligence–III (WPPSI-III), as they target the ability to self-regulate, and the Block Design subtest of the WPPSI-III, as this subtest targets the ability to exercise symbolic thought. The children in the Vygotskian group were administered these subtests at the beginning of a school year. They then participated in the VPEP for one academic year (a total of 36 weeks) and were

retested in the fall of the next school year. The children in the control group were administered these subtests at the beginning of the school year. They then enjoyed all the regular academic-centered curriculum activities for one academic year (a total of 36 weeks) and were then retested in the fall of the next school year.

The Vygotskian preschool education program

The program included six activities: sociodramatic play; architects, builders, and building inspectors; constructing models of fairy tales; constructing and using room plans; using schedules of the day; and “do as the animal does.”

Sociodramatic play. Sociodramatic play is children’s joint activity, in which they choose a plot that reflects a certain aspect of social relations (e.g., buying something in a store), distribute roles (e.g., a seller and buyers), and play together imitating the chosen aspect of social relations. Vygotsky (1966/1976) stressed the importance of sociodramatic play for children’s development, characterizing it as “the leading source of development in pre-school years” (p. 537). First, as opposed to the traditional view of play as children’s free activity, “play continually creates demands on the child to act against immediate impulse” (Vygotsky, 1978, p. 99), and playing children help each other meet these demands by strictly monitoring and regulating playmates’ following of their play roles. Such mutual regulation, as mentioned above, results in the development of self-regulation: “a child’s greatest self-control occurs in play” (Vygotsky, 1978, p. 99). This ability to exercise self-regulation is later expanded to non-play activities; therefore, as has been documented in several studies, children’s engagement in sociodramatic play predicts further development of their self-regulation (Elias & Berk, 2002; Saltz, Dixon, & Johnson, 1977). Second, in play, children use object substitutes: that is, objects that stand for missing objects (e.g., when playing at a tea party, children use sticks instead of teaspoons). Such object substitutions, as noted, are beneficial for the development of children’s symbolic thought. Thus, sociodramatic play promotes in children the

development of both major components of school readiness: self-regulation and symbolic thought.

As opposed to the traditional view of play as children's independent activity, with which adults should not interfere, Vygotskians (Elkonin, 1978) as well as some Western researchers (Smilansky & Shefatya, 1990), have insisted that adults mediate play. This view has been supported with observations collected in many countries that, without adult mediation, children do not play at all, or their play remains at a very low level (Elkind, 1987, 1990; Glaubman, Kashi, & Koresh, 2001; Smilansky & Shefatya, 1990; Tizard, 1977). To mediate play, the teacher in our study used several strategies. First, the teacher encouraged children to move from object-centered play to role play (e.g., by suggesting to a girl who was engaged in feeding a doll with a spoon, "to take her baby for a walk," which helped the girl realize that she was actually imitating the role of a loving mother). Later, the teacher helped children involved in solitary role play to connect their episodes, aiding them in moving from solitary play to sociodramatic play (e.g., she suggested to a boy playing with a toy car that he give a ride to a hospital to a girl who was playing with a doll because "her baby got sick"). Still later, the teacher helped children join different plots within one play (e.g., by encouraging children playing "family life" to join a group of children playing "hospital," initiating their new game, in which parents were bringing their sick baby to the hospital). Each child in the Vygotskian group participated in sociodramatic play for 2.5 hours a week.

Architects, builders, and building inspectors (Brofman, 2001). Children learned how to be architects: how to draw a house or castle from different sides. In the beginning, they were given stencils (transparent templates) and different blocks (e.g., a cylinder). The children had to find the openings in the stencil that represented three views of this block (the front view, the side view, and the view from above) and use these openings to draw the three views of the block. Then the assignments became more difficult: the child was given a two-block construction (e.g., "a house") and had to use the stencil to draw its

three views. Finally, the children were engaged in the following activity: One of the children (the architect) used the stencil to draw the front view and the view from above of the imaginary castle to be built. Another child (the builder) built the castle following the architect's drawings. Then, the architect drew the side view of the built castle. After that, a third child (the building inspector) checked whether or not the castle matched the drawings. It was important that each child was provided with an opportunity to enjoy each of these roles: if, on one day, a child was the builder, then on another day this child was the architect and then the inspector. Each child in the Vygotskian group participated in this activity for 2 hours and 20 minutes a week.

This activity was expected to contribute to the development of both components of the children's school readiness. When drawing the three views of a building, using the drawings to construct the building, or checking whether or not the castle matched the drawings, children were working with external symbolic representations. Such experience, as discussed, is beneficial for the development of symbolic thought. Additionally, while performing the roles of an architect, builder, and building inspector, children were engaged in mutual regulation (on one day, a child inspected the correctness of the building against the drawings, and, on another day, another "inspector" evaluated the correctness of the first child's building). Such mutual monitoring, as discussed, contributes to the development of children's self-regulation.

Constructing models of fairy tales (Dyachenko, 1986). When adults read a story or an article with the goal of remembering it, they construct a mental model of the text, which represents its main episodes. Young children cannot construct such mental models. Therefore, when asked to listen to and retell a tale, young children, as a rule, try to memorize the tale word for word. As a result, they retell some of the sentences word for word regardless of whether or not these sentences are important but skip some of the major episodes of the tale. The goal of the activity described next is to teach children how to construct external symbolic models of a tale to be memorized.

First, children were taught how to use substitutes (paper cutouts) to represent the main characters and to model different episodes of a tale the teacher was reading for them (e.g., “the cat went to the forest”—a child moved a gray circle to the picture of a forest on his table; “the fox went to the rooster’s house”—the child moved an orange circle to the picture of the rooster’s house; etc.). Later, several children worked together on the same table. One of them used paper cutouts to model a tale episode, another child evaluated the correctness of the model of this episode constructed by the first child, and the third child retold this episode following the model constructed. Then, the children switched their roles. At the next step, the children were taught how to construct the model of a whole tale. With the teacher’s help, they used paper cutouts to reproduce the major episodes of a new tale in a special field that consisted of a set of sections: the number of sections was equal to the number of the episodes in the tale. Then, they used the model constructed to retell the tale. Each child in the Vygotskian group participated in this activity for 1 hour a week.

To be sure, learning how to construct an external symbolic model of a new story and then follow the external representations of the story’s main episodes to retell them is a very important academic accomplishment; this is a foundation for the development of reading comprehension. However, in addition, this experience was expected to lead to developmental outcomes. The use of external symbolic models, as discussed, should have promoted the development of the children’s symbolic thought. Also, the children’s mutual control, in which they were engaged at certain steps of the described activity, should have resulted in the development of their self-regulation.

Constructing and using room plans (Lavrent’eva, 1986). In this activity, the children constructed and used room plans for the arrangement of and search for different objects. At first, this activity was built around the construction and use of plans for the furniture arrangement in a dollhouse. For example, the child was asked to use paper cutouts, the sizes and shapes of which corresponded to different pieces of furniture (a circle for a table, a small square for a chair, a long rectangle for a bed, etc.), to construct a plan of a

furnished dollhouse on a special board. Or, the child was asked to use a plan of a furnished dollhouse to arrange the furniture in the dollhouse. Later, the children were offered another task. They were provided with a furnished dollhouse, which had a picture of a beetle hidden under one of the furniture pieces, and with a plan of the furniture arrangement (one furniture piece in the plan had a mark indicating a beetle hidden underneath this piece). The child had to use the plan to find the beetle in the dollhouse. Still later, one child hid a beetle under a furniture piece, marked the corresponding piece in the plan, and another child had to find the beetle following the mark in the plan. After the children mastered the construction and use of plans of a dollhouse, they started performing this activity in a “real” environment: for example, in their classroom. Accordingly, the plans that the children worked with represented reduced models of their classroom. The tasks that the children performed were similar to some of those that they had performed with the dollhouse (e.g., they used the plan to look for a “bear,” who had hidden under a furniture piece). Each child in the Vygotskian group participated in this activity for 40 minutes a week.

Since room plans are external symbolic representations, their use by the children was supposed to lead to the development of their symbolic thought. Additionally, some tasks involved the children’s joint activity with elements of mutual monitoring, which, as discussed, should have been advantageous for the development of their self-regulation.

Using schedules of the day (Venger & Venger, 1994). The children, together with the teacher, chose a symbol (a “ticket”) for each of the class activities: reading, constructive play, sociodramatic play, and so on (e.g., a picture of an open book for “reading”). Then, in the morning, each child was provided with the schedule of the day’s class activities that was presented as a set of such symbols. The child found what their first class-activity was and participated in it, after which the teacher put a sticker under the symbol of the first activity in the child’s schedule and returned the schedule to the child. The child, with the teacher’s help, found the next class activity in their

schedule, participated in it, and so on. At that point, the responsibility for monitoring the child's participation in the class activities was divided between the teacher and the child. At the next step, the teacher passed more responsibility for such monitoring to the child: the child put a sticker under the completed class activity themselves and then found the next activity in the schedule. Still later, putting up stickers was totally eliminated: after the completion of each class activity, the child simply looked at the schedule to find their next class activity.

Thus, the children were gradually moved from following the teacher's directions with the use of external tools (stickers) to giving directions to themselves without such tools. This was expected to contribute to the development of the children's self-regulation. Additionally, the use of symbols of different activities was supposed to be advantageous for the development of the children's symbolic thought.

"Do as the animal does." The teacher introduced four pictures to the children: "This is a frog, it is jumping. And this is a turtle, it is walking very slowly. And this is a rabbit, it is running fast. And this is a bear, it is sleeping." When showing each picture, the teacher modeled the animal's behavior. The teacher then suggested that the children play a new game: when a picture was shown, they all should say what the animal in the picture was doing and do it. Then, the teacher showed, for example, the rabbit, said together with the children "run!", and the children ran in place. Then, the teacher showed the frog, said together with the children "jump!", and the children jumped in place. Then, at the picture of a turtle, the teacher said together with the children "slow!", and the children walked slowly in place. The picture of a bear was used to make children calm down: they said "sleep!" and stayed still. At the next step, the teacher just showed the pictures silently, and the children gave the commands to themselves aloud: "run!", "jump!", "slow!", "sleep!", and so on, and followed these commands. Then, one of the children showed the pictures, and the other children gave commands to themselves and followed these commands (all the children, in turn, enjoyed the role of the "teacher").

After this, the rules of the game became more complicated: the teacher suggested that the children should not follow what a given animal did unless the teacher also said “please.” This complication was very important. Before, the children had performed the actions without making a conscious decision, almost as a conditioned response. Now, before acting, they had to make a conscious decision about whether or not the action prescribed by the picture should be performed. Thus, the teacher showed the pictures to the children—sometimes saying “please,” and sometimes without saying “please.” If “please” was said, the children said aloud what the act was that they had to perform (e.g., “jump”) and then performed the act. If “please” was not said, the children remained still. First, the teacher gave commands, then the children, in turn, took the role of the teacher.

Next, the children performed the task without giving themselves commands aloud: if the teacher showed a picture and said “please,” the children did what the picture said; if the teacher did not say “please,” the children remained still. Finally, another important complication was introduced: if the teacher showed a picture and said “please,” the children performed the required action only after the teacher had counted aloud to three (later, to 10). As before, if “please” had not been said, the children did not perform any action after the teacher finished counting. Again, first it was the teacher who ran this activity, then the children, in turn, took the role of the teacher.

This activity (in which each child in the Vygotskian group participated for 30 minutes a week) was expected to promote the development of the children’s self-regulation, since it involved their gradual transition from acting while regulated by others, to acting by giving themselves commands aloud, to acting by giving themselves internal commands.

Observations of children’s behavior in the Vygotskian group

At the beginning of the school year, children in the Vygotskian group demonstrated serious self-control problems: as soon as they became

acquainted with the class environment, they recovered from their initial shyness and became hyperactive, constantly moving throughout the classroom. They hardly responded to the teacher's instructions and grasped any object or toy they liked. They interacted with classmates (and even with the teacher) in an aggressive manner, often getting into brutal fights with each other because of minor issues. Their communicative language was poor but, with no shortage of dirty words, supplemented with showing the third finger.

Probably the first encouraging observation made very soon after the implementation of the VPEP related to the development in children of a very positive attitude toward the program activities. Their strong interest in these activities often revealed itself in questions such as "when will we be drawing houses?" or "when will we be playing a frog?" Their parents reported that the children were telling them with excitement about their classroom activities, were looking forward to coming to school, and were upset when, because of some reason, they had to stay home. The teacher indicated that group attendance was unusually high.

Already in December, the teacher and the parents started reporting changes in the children's behavior. They behaved in a less impulsive manner, showed less aggressiveness toward each other and to their siblings (which had been quite typical of them at the beginning of the school year), demonstrated better social skills (e.g., if one of them wanted a toy that another child was playing with, they would ask for this toy rather than trying to pull it away), and revealed an increased ability to follow instructions and listen to the teacher's explanations.

Before the spring school break, still more visible changes in the children's behavior were observed and reported. They successfully followed the teacher's instructions, their impulsivity was almost totally eliminated, and their social skills were substantially improved. For example, during their visit to the Metropolitan Museum of Art in New York City, the museum guide said that she had rarely seen a group of such well-behaved and interested pre-K children.

By the end of the school year, both the teacher and the parents reported that the behavior and performance of their children further improved. The children would not get distracted when performing a task, and their ability to exercise self-control had substantially increased. It was around this time that a funny episode took place. Two boys “fell in love” with the same girl from their class. However, rather than fighting (which they would have done several months earlier), they decided to meet at the classroom corner and discuss this difficult situation and possible solutions. As an outcome of this discussion, in the future, both of them would play with this girl without expressing hard feelings toward each other.

Results

The major tools that we used to evaluate the effectiveness of the VPEP were the Coding, Symbol Search, and Block Design subtests of the WPPSI-III that we administered in the Vygotskian and control groups at the beginning of the school year and in the fall of the following school year. The results of *t* tests indicated that there were no statistically significant differences between the pretest scores of the control and Vygotskian groups: Block Design, $t(27) = 0.3548$, $p = .7255$; Coding, $t(20) = 0.7837$, $p = .4424$; and Symbol Search, $t(19) = 0.1968$, $p = .8461$.

Multivariate analysis of variance (MANOVA) was employed to examine the simultaneous effect of the VPEP on the posttest scores in Block Design, Coding, and Symbol Search. Posttest scores were obtained for all three subtests for 18 participants in the Vygotskian group and 12 participants in the control group. There were no missing pretest data for Block Design in the Vygotskian and Control groups. For the Symbol Search task, three participants in the Vygotskian group and five participants in the control group were missing pretest data. For the Coding task, three participants in the Vygotskian group and four participants in the control group were missing pretest data. Mean substitution was used for missing data, with the means derived separately for each dependent measure.

The dependent variables in the MANOVA were the rates of change between the Vygotskian and control groups. More specifically, the analysis examined whether greater improvement was observed in the Vygotskian group from pretest to posttest, relative to the control group. Each participant's improvement score was calculated by subtracting their pretest score from their posttest score. The improvement scores were obtained for the Block Design, Coding, and Symbol Search tasks and were entered into the MANOVA as dependent variables, with Vygotskian and control groups entered as the independent variable.

The MANOVA revealed an overall larger improvement for the Vygotskian group compared to the control group across all three dependent variables, $F(3, 26) = 4.16, p = .016$. These results show that the VPEP was effective overall at improving performance from the pretest to the posttest. Thus, it can be concluded that VPEP overall promoted the development of school readiness in the Vygotskian group to a greater extent than the regular academic-centered curriculum did in the control group.

Follow-up univariate analyses of variance were also conducted to examine whether the VPEP improved performance on each dependent variable separately. The VPEP had the strongest effect on the Coding task, $F(1, 30) = 10.6, p = .003$, accounting for 27.5% of the observed variance in the improvement scores ($R^2 = .275$; see Figure 1).

Symbol Search improvement was also significantly higher for the Vygotskian group compared to the control group, $F(1, 30) = 4.8, p = .037$, accounting for 14.7% of the observed variance in the improvement scores ($R^2 = .147$; see Figure 2).

Since the Coding and Symbol Search tasks targeted the ability to self-regulate, it can be concluded that the VPEP promoted the development of self-regulation in the Vygotskian group to a much greater extent than the regular academic-centered curriculum did in the control group. Block Design improvement scores were marginally higher in the Vygotskian group, $F(1, 30) = 2.5, p = .060$, accounting for 8.3% of the observed variance in the

improvement scores ($R^2 = .083$; see Figure 3). Since the Block Design task targeted the ability to exercise symbolic thought, it can be concluded that the VPEP promoted the development of symbolic thought in the Vygotskian group to a greater extent than the regular academic-centered curriculum did in the control group.

Figure 1. Follow-up univariate analysis of variance—Coding task. Error bars: ± 1 SE.

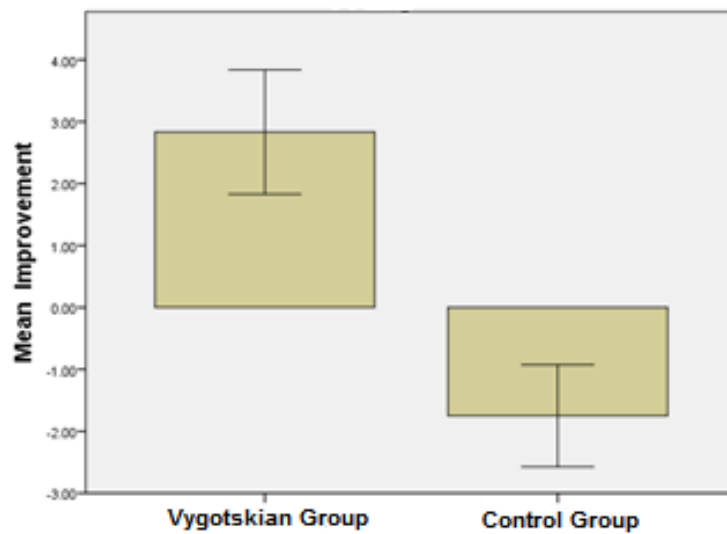


Figure 2. Follow-up univariate analysis of variance—Symbol Search. Error bars: ± 1 SE.

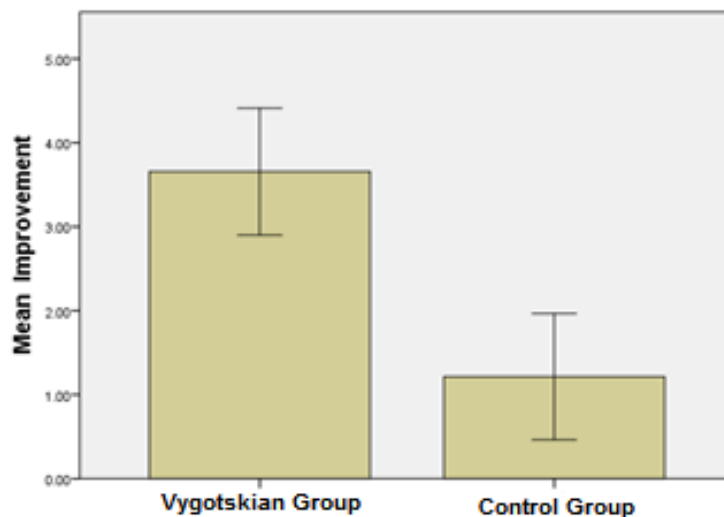
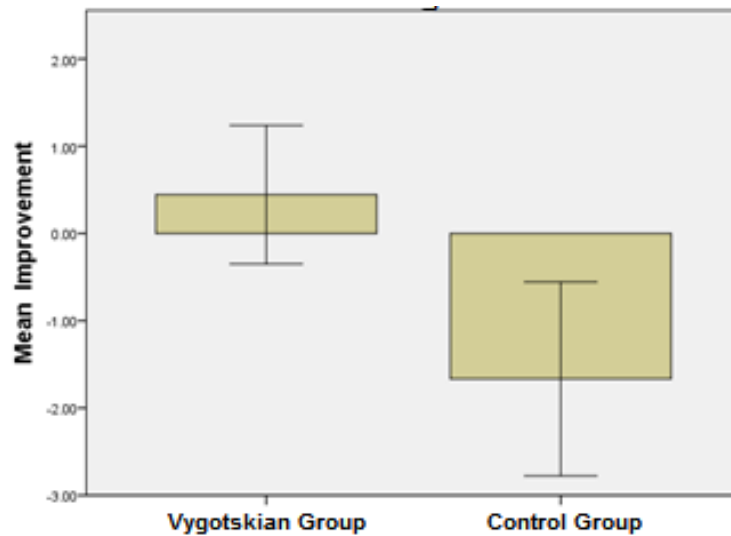


Figure 3. Follow-up univariate analysis of variance—Block Design. Error bars: ± 1 SE.



Discussion

The main objective of this study was to evaluate the effectiveness of the VPEP for the development of self-regulation and symbolic thought in American preschoolers. Our experimental data have demonstrated that the VPEP can be readily incorporated into the pre-K curriculum of American preschool educational settings, strongly promotes the development of preschoolers’ self-regulation, and is beneficial for the development of their symbolic thought. In our view, these data contribute to solving one of the major problems in American contemporary preschool education: the problem of the content and goals of preschool education.

Lately, both American educators and the general public have been engaged in a heated discussion of whether preschool education should target the development in children of academic skills such as counting and reading, or instead be built around play-centered activities and contribute to the development of school readiness. The recent adoption of Common Core Standards represents a clear victory for those in the US who advocate the former. (see). However, those who believe that teaching preschoolers academic skills “threatens to destroy appropriate and effective approaches to early

education” (Strauss, 2015) are not surrendering. The position statement of the National Association for the Education of Young Children (2009) clearly states that “rather than detracting from academic learning, play appears to support the abilities that underlie such learning and thus to promote school success” (p. 15). Advocacy groups such as Defending the Early Years seek “to promote appropriate practices in early childhood classrooms and support educators in counteracting current reforms which undermine these appropriate practices” (Defending the Early Years, 2012).

The problem is, however, that the developmental outcomes of engaging preschoolers in play-centered activities have not been clearly demonstrated in the studies of American researchers. For example, the experimental results on the role of play in developing self-regulation “have been inconclusive and more studies are needed” (Berk & Meyers, 2013, p. 98). As we already indicated, evaluative data on the developmental outcomes of “Tools of the Mind,” a preschool Vygotskian curriculum built around play-centered activities, are also mixed (see Diamond et al., 2007; Wilson & Farran, 2012).

Our study has demonstrated that the VPEP, built around play-centered activities, better promotes the development of the major components of school readiness (self-regulation and symbolic thought) compared to a regular, daily, academic-centered preschool curriculum. From this perspective, the significance of our study is in fact that it provides additional support to the position of those who have been fighting against “the death of preschool” (Tullis, 2011, p. 36).

Final notes

1. We realize that “the summer hiatus” could have influenced the children’s scores, but there should be at least a 1-year period before WPPSI-III may be retaken by children. Also, we do not have any reason to believe that the summer hiatus had a different influence on the children in the Vygotskian group than on the children in the control group. Therefore, the summer hiatus influence may be disregarded when comparing the subtest scores of these two groups of children.

- 2 As described here, the activity was modified by the authors.
- 3 This activity was designed by the authors.
- 4 We are grateful to Leib Litman for his help with the statistical analysis of our data.

Educación preescolar vygotskiana: promoviendo el desarrollo de la autorregulación y el pensamiento simbólico en niños preescolares

RESUMEN

El Programa de Educación Preescolar Vygotskiana (PEPEV) se basa en la mediación en el contexto de actividades específicas para la edad preescolar, como el juego de roles sociales, el juego constructivo, escuchar y volver a contar cuentos de hadas, jugar con casas de muñecas, actividades motoras y otras. Utilizamos PEPEV como parte del plan de estudios diario en dos clases de preescolar en la escuela pública 197 en Harlem, Nueva York, para promover el desarrollo de la autorregulación y el pensamiento simbólico de los niños. Otra clase de preescolar en la escuela pública 197 se utilizó como grupo de control. Para las pruebas previas y posteriores, se administraron subpruebas Codificación y Búsqueda de Símbolos de la Escala de Inteligencia de Wechsler para Educación Preescolar y Básica, que tienen como objetivo verificar la capacidad de autorregulación del niño, y la subprueba de Dibujo de Bloques de la misma escala, que tiene como objetivo verificar la capacidad de ejercitar el pensamiento simbólico. Los resultados del estudio demuestran que el PEPEV promueve el desarrollo de la autorregulación de los preescolares y es beneficioso para el desarrollo de su pensamiento simbólico.

Palabras claves: Educación pré-escolar. Vygotsky. Mediación. Autorregulación. Pensamiento simbólico.

References

- Berk, L. E., & Meyers, A. B. (2013). The role of make-believe play in the development of executive function: Status of research and future directions. *American Journal of Play*, 6(1), 98–110.
- Blair, C. (2002). School readiness: Integrating cognition and emotion in a neurobiological conceptualization of children's functioning at school entry. *American Psychologist*, 57(2), 111–127.
- Blair, C., & Raver, C. C. (2014). Closing the achievement gap through modification of neurocognitive and neuroendocrine function: Results from a cluster randomized controlled trial of an innovative approach to the education of children in kindergarten. *PLoS ONE*, 9(11), Article e112393. DOI: <https://doi.org/10.1371/journal.pone.0112393>.
- Blair, C., & Raver, C. C. (2015). School readiness and self-regulation: A developmental psychobiological approach. *Annual Review of Psychology*, 66, 711–733.

Bodrova, E., & Leong, D. J. (2007). *Tools of the mind: The Vygotskian approach to early childhood education* (2nd ed.). Columbus, OH: Merrill/Prentice Hall.

Bozhovich, L. I. (1968). *Lichnost i ee formirovanie v detskom vozraste* [Personality and its development in childhood]. Moscow, Russia: Prosveschenie.

Brofman, V. V. (2001). *Arhitekturnaya shkola imeni papy Karlo* [Papa Carlo architect school]. Moscow, Russia: Linka-Press.

Defending the Early Years. (2012). About. Retrieved from <https://www.deyproject.org/about.html>.

Diamond, A., Barnett, W. S., Thomas, J., & Munro, S. (2007). Preschool program improves cognitive control. *Science*, *318*, 1387–1388.

Dyachenko, O. M. (1986). Formirovanie sposobnosti k naglyadnomu modelirovaniyu pri oznakomlenii s detskoj khudozhestvennoi literaturoi [Formation of graphic modeling in the course of becoming acquainted with children's literature]. In L. A. Venger (Ed.), *Razvitie poznavatelnykh sposobnostei v protsesse doskolnogo vospitaniya* [Development of cognitive abilities in the course of preschool education] (pp. 94–113). Moscow, Russia: Pedagogika.

Elias, C. L., & Berk, L. E. (2002). Self-regulation in young children: Is there a role for sociodramatic play? *Early Childhood Research Quarterly*, *17*(2), 216–238.

Elkind, D. (1987). *Miseducation: Preschoolers at risk*. New York, NY: Knopf.

Elkind, D. (1990). Too much, too soon. In E. Klugman & S. Smilansky (Eds.), *Children's play and learning: Perspectives and policy implications* (pp. 3–17). New York, NY: Teachers College Press.

Elkonin, D. B. (1978). *Psikhologiya igry* [Psychology of play]. Moscow, Russia: Pedagogika.

Glaubman, R., Kashi, G., & Koresh, R. (2001). Facilitating the narrative quality of sociodramatic play. In A. Göncü & E. Klein (Eds.), *Children in play, story, and school* (pp. 132–157). New York, NY: Guilford Press.

Haywood, H. C., Brooks, P. H., & Burns, S. (1992). *Bright start: Cognitive curriculum for young children*. Watertown, MA: Charlesbridge.

Kravtsov, G. G., & Kravtsova, E. E. (1987). *Shestiletniy rebenok: Psikhologicheskaya gotovnost k shkole* [Six-year-old child: Psychological school readiness]. Moscow, Russia: Znanie.

Lavrent'eva, T. V. (1986). Formirovanie sposobnosti k naglyadnomu modelirovaniyu pri oznakomlenii s prostranstvennymi otnosheniyami [Formation of graphic modeling in the course of becoming acquainted with space relationships]. In L. A. Venger (Ed.), *Razvitie poznavatelnykh sposobnostei v protsesse doshkolnogo vospitaniya* [Development of cognitive abilities in the course of preschool education Translation] (pp. 33–50). Moscow, Russia: Pedagogika.

National Association for the Education of Young Children. (2009). *Developmentally appropriate practice in early childhood programs serving children from birth through age 8*. [Position statement]. Retrieved from <https://www.naeyc.org/sites/default/files/globally-shared/downloads/PDFs/resources/position-statements/PSDAP.pdf>.

Normandeau, S., & Guay, F. (1998). Preschool behavior and first-grade school achievement: The mediational role of cognitive self-control. *Journal of Educational Psychology, 90*, 111–121.

Piaget, J. (1962). *Play, dreams, and imitation in childhood*. New York: Norton. (Original work published 1945)

Saltz, E., Dixon, D., & Johnson, J. (1977). Training disadvantaged preschoolers on various fantasy activities: Effects on cognitive functioning and impulse control. *Child Development, 48*(2), 367–380.

Smilansky, S., & Shefatya, L. (1990). *Facilitating play: A medium for promoting cognitive, socio-emotional, and academic development in young children*.

Gaithersburg, MD: Psychosocial & Educational Publications.

Strauss, V. (2015, January 14). Requiring kindergartners to read—as Common Core does—may harm some. *The Washington Post*. Retrieved from <https://www.washingtonpost.com/news/answer-sheet/wp/2015/01/13/report-requiring-kindergartners-to-read-as-common-core-does-may-harm-some/>

Talyzina, N. F. (2001). *Pedagogicheskaya psikhologiya* [Educational psychology]. Moscow, Russia: Academia.

Tizard, B. (1977). Play: The child's way of learning? In B. Tizard & D. Harvey (Eds.), *Biology of play* (pp. 199–208). London, United Kingdom: Heinemann.

Tullis, P. (2011). The death of preschool. *Scientific American Mind, 22*, 36–41.

Venger, L. A. (Ed.). (1986). *Razvitie poznavatelnykh sposobnostei v protsesse doshkolnogo vospitaniya* [Development of cognitive abilities in the process of preschool education]. Moscow, Russia: Pedagogika.

Venger, L. A. & Kholmovskaya, V. V. (Eds.). (1978). *Diagnostika umstvennogo razvitiya doshkolnikov* [Evaluation of mental development of preschoolers]. Moscow, Russia: Pedagogika.

Venger, L. A., & Venger, A. L. (1994). *Domashnyaya shkola* [School at home]. Moscow, Russia: Znanie

Vygotsky, L. S. (1976). Play and its role in the mental development of the child. In J. S. Bruner, A. Jolly, & K. Sylva. (Eds.), *Play: Its role in development and evolution* (pp. 537–554). New York, NY: Basic Books. (Original work published 1966)

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes* (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds.). Cambridge, MA: Harvard University Press.

Vygotsky, L. S. (1981). The genesis of higher mental functions. In J. V. Wertsch (Ed.), *The concept of activity in Soviet psychology* (pp. 144–188). Armonk, NY: Sharpe.

Vygotsky, L. S. (1986). *Thought and language*. Cambridge, MA: MIT Press. (Original work published 1934).

Vygotsky, L. S. (1998). *The collected works of L. S. Vygotsky, Vol. 5: Child psychology* (R. W. Rieber, Ed.). New York, NY: Plenum. (Original work published 1984).

Wilson, S. J., & Farran, D. (2012). *Experimental evaluation of the Tools of the Mind curriculum*. Nashville, TN: Peabody Research Institute, Vanderbilt University.

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