

children cannot mentally reverse the clay-rolling process to see that the amount of clay is the same in both the shorter ball shape and the longer stick shape.

In addition to failing to conserve volume, preoperational children fail to conserve number, matter, length, and area. However, children often vary in their performance on different conservation tasks. Thus, a child might be able to conserve volume but not number.

Some developmental psychologists do not believe that Piaget was entirely correct in his estimate of when children's conservation skills emerge. For example, Rochel Gelman (1969) showed that when children's attention to relevant aspects of the conservation task is improved, they are more likely to conserve. Gelman has also demonstrated that attentional training on one dimension, such as number, improves preschool children's performance on another dimension, such as mass. Thus, Gelman believes that conservation appears earlier than Piaget thought and that attention is especially important in explaining conservation.

Vygotsky's Theory

Like Piaget, Vygotsky was a constructivist, but Vygotsky's theory is a **social constructivist approach**, and it emphasizes the social contexts of learning and the construction of knowledge through social interaction. In Vygotsky's view, children's cognitive development depends on the tools provided by society, and their minds are shaped by the cultural context in which they live (Moura da Costa & Tuleski, 2017; Yu & Hu, 2017). Earlier, we described some basic elements of Vygotsky's theory. Here we expand on his theory, exploring his ideas about the zone of proximal development, scaffolding, and the young child's use of language.

The Zone of Proximal Development and Scaffolding

Vygotsky's belief in the importance of social influences, especially instruction, on children's cognitive development is reflected in his concept of the zone of proximal development. **Zone of proximal development (ZPD)** is Vygotsky's term for the range of tasks that are too difficult for the child to master alone but can be learned with the guidance and assistance of adults or more-skilled children. Thus, the lower limit of the ZPD is the level of skill reached by the child working independently. The upper limit is the level of additional responsibility the child can accept with the assistance of an able instructor (see Figure 6). The ZPD captures the child's cognitive skills that are in the process of maturing and can be accomplished only with the assistance of a more-skilled person (Holzman, 2017). Vygotsky (1962) called these the "buds" or "flowers" of development, to distinguish them from the "fruits" of development, which the child can already accomplish independently.

What are some factors that can influence the effectiveness of the ZPD in children's learning and development? Researchers have found that the ZPD's effectiveness can be enhanced by factors such as the following (Gauvain, 2013): better emotion regulation, secure attachment, absence of maternal depression, and child compliance.

social constructivist approach

An approach that emphasizes the social contexts of learning and that knowledge is mutually built and constructed. Vygotsky's theory reflects this approach.

zone of proximal development (ZPD)

Vygotsky's term for tasks that are too difficult for children to master alone but can be mastered with assistance.

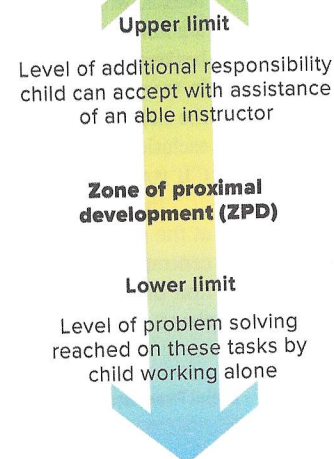
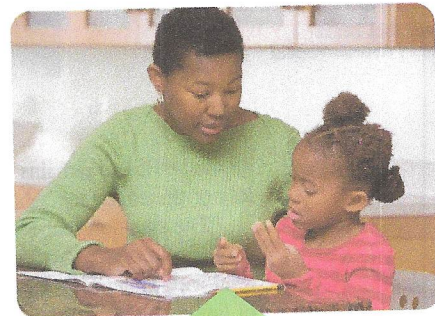


Figure 6 Vygotsky's Zone of Proximal Development

Vygotsky's zone of proximal development has a lower limit and an upper limit. Tasks in the ZPD are too difficult for the child to perform alone. They require assistance from an adult or a more-skilled child. As children experience the verbal instruction or demonstration, they organize the information in their existing mental structures so they can eventually perform the skill or task alone.

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How Would You...?

As an educator, how would you apply Vygotsky's ZPD theory and the concept of scaffolding to help a young child complete a puzzle?