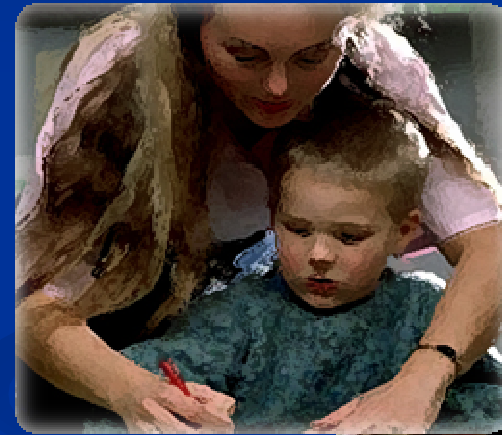


COGNITIVE DEVELOPMENT

- Culture is the prime determinant of cognitive development
- Learning leads cognitive development



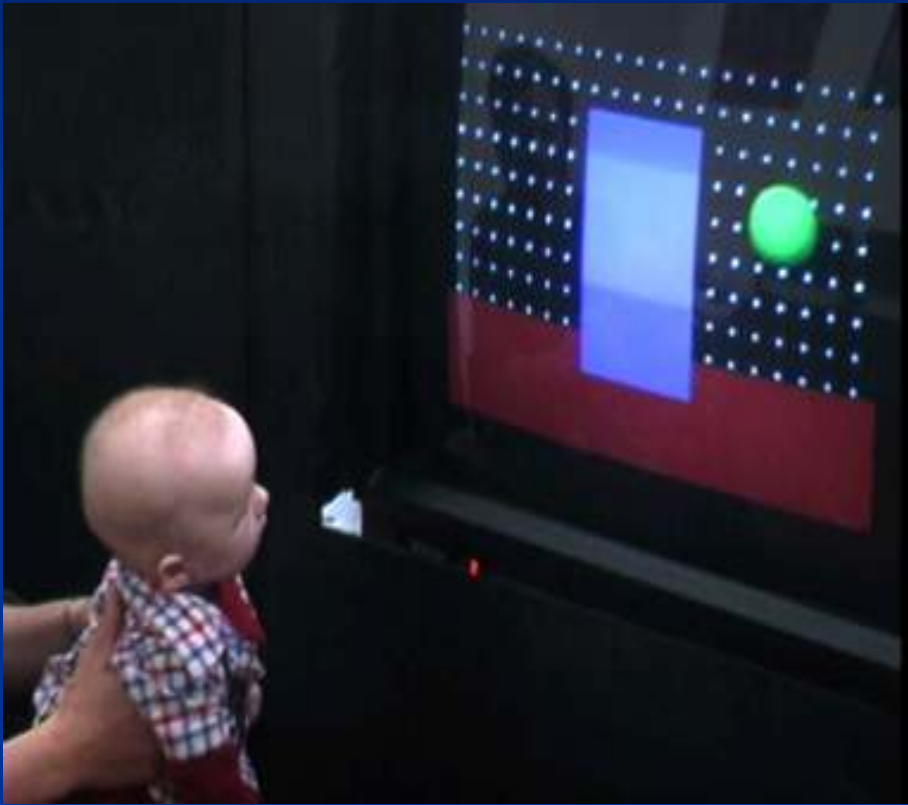
Lev S. Vygotsky

The social formation of mind

Vygotsky believed that individual development could not be understood without reference to the social and cultural context within which such development is embedded



Mind evolution is continuous



Unlike Piaget or Bruner, Vygotsky focused on the mechanism of the development, excluding distinguishable developmental stages

Vygotsky's theoretical assumptions

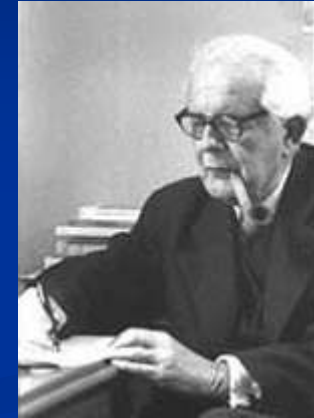
He rejected the idea that a single abstract principle, such as equilibration, can explain cognitive development



He offered an alternative to Piaget's constructivism

Piaget: Mind models the external world

Human beings make sense of their world by means of their mental structures



Vygotsky: External world models the mind

Knowledge is internalization of social activity

Mediation



Mediation means that human beings purposefully interpose tools between them and their environment, in order to modify it and obtain certain benefits. Example: farmers plough the earth to acquire better crops.

Mediation is a central concept in Vygotsky's view of cognitive development. It offers a complementary perspective to the behaviourist view.



He states that by using activity mediators, the human being is able to modify the environment, and this is her way of interacting with the nature

Mediation

Two phenomena marked the mediated relationship of humans with their environment:

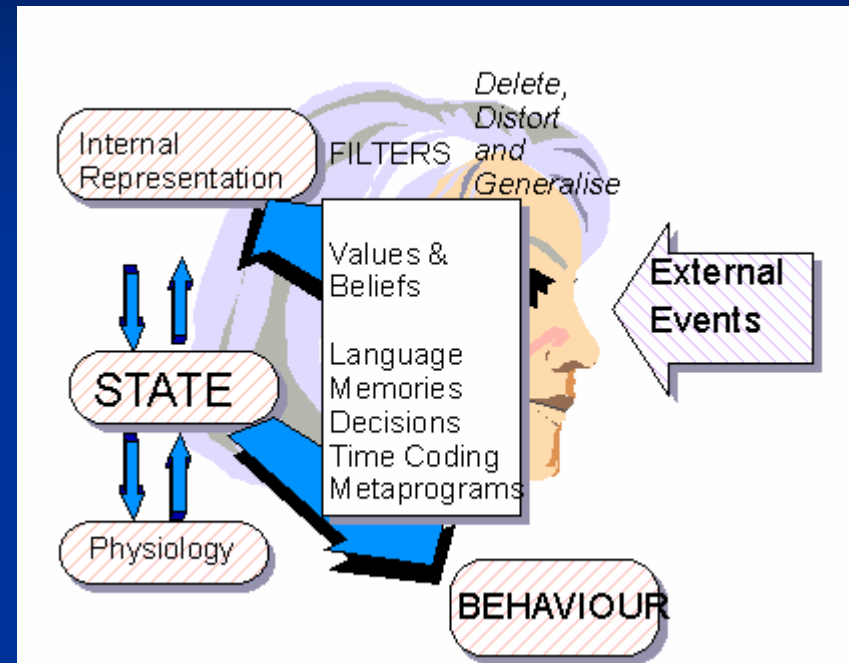
The use of tools within social organized activity



The use of language as a cultural form of mediation

Mediation → intelligence → higher mental processes

How people
convert social
relations into
psychological
functions?



They use different types of language (signs) as mediators between their minds and their environment

Higher mental processes: symbolic mediation

When a child tries to grasp an object, and parents interpret this gesture as a pointing out to the object, they give her the object. She internalizes the gesture as a way of acquiring the object. After repeating this behaviour with other objects, the mental representation of this behaviour becomes more abstract. An interpersonal relation between child and parents becomes intrapersonal (child's representation of acquiring objects).



Decontextualization

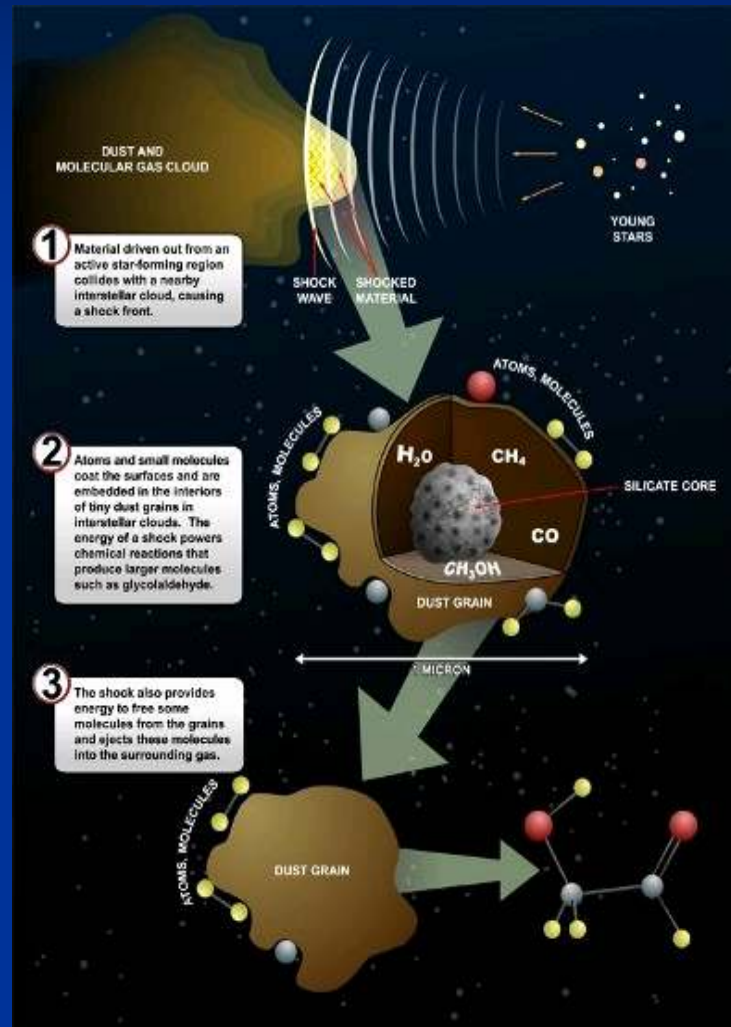
The use of abstract language is the most important sign-mediated behaviour that occurs during cognitive



development. It appears as the detachment from the individual features of the environment . An example is when children start to play with abstract objects.

Mediation → intelligence → higher mental processes

During humankind's evolution, more complex structures of activity mediated by more complex tools produce more complex mental structures.



Psychological tools enable us to perform higher mental functions:

- *various systems for counting*
- *mnemonic techniques*
- *algebraic symbol systems*
- *works of art*
- *writing*
- *schemes, diagrams, maps, and technical drawings*
- *all sorts of conventional signs*

Zone of proximal development (ZDP)

It represents one of the most obvious difference between Vygotsky's and Piaget's view of cognitive development

Zone of proximal development (ZPD)

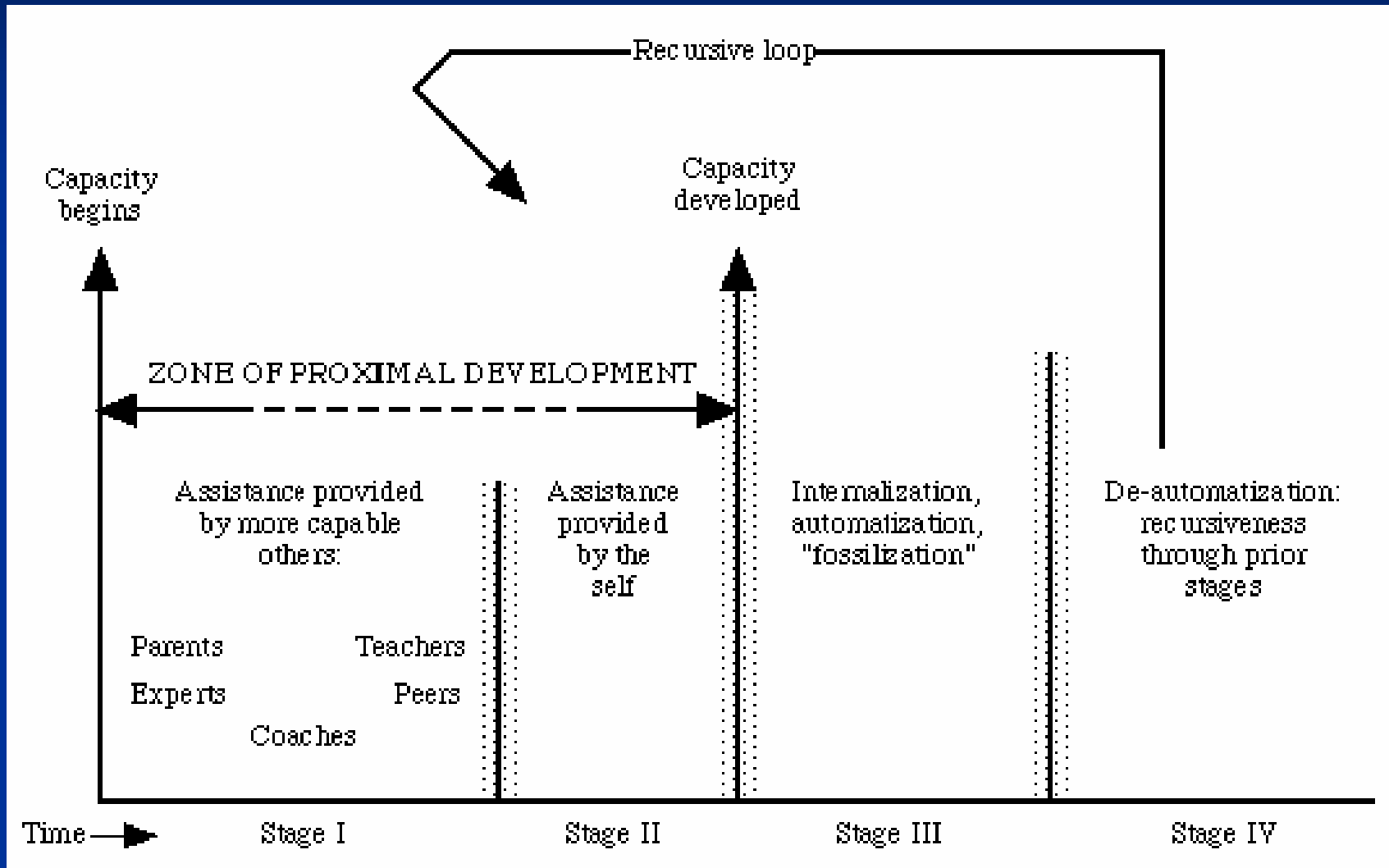
This is the vygotskian concept that explains the mechanism of cognitive development

ZPD is actually the gap between actual competence level (what problem level a student is able to independently solve), and the potential development level (what problem level could she solve with guidance from a tutor)

ZPD is based on the mental functions that have not yet matured but are being in the process of maturation.



Zone of proximal development



Zone of proximal development (ZDP)



It supports a representation of intellectual development based on continuity.

It states that learning can force cognitive development

It states the role of the teacher as a necessary mediator of child's cognitive development.

Learning, instruction and development in Vygotsky's view

The only good type of instruction is that which leads the cognitive development.

The only good learning is that which is in advance of the development. Learning that is situated within the current developmental level is not desirable .

How could we understand the statement that some learning doesn't bring development?

Scaffolding



Cognitive development in the zone of proximal development stresses the role of a social partner of the student (a teacher or a more skilled peer).

Scaffolding: the instructor becomes a supportive tool for the student in the zone of proximal development. The characteristics of an ideal teacher are those of a scaffold:

It provides support

It functions as a tool

It extends the range of the worker

It allows to accomplish a task otherwise impossible

It is used selectively, when needed



Scaffolding

In Vygotsky's view, learning is an interactive, interpersonal activity:

Instructor and student co-construct the solution to problem

Inequality between partners resides only in their respective levels of understanding. Authority is shared

The psychological mechanism is to create (external) activities that will be later internalized by student

Scaffolding example:

Palincsar's reciprocal learning (an instructional strategy for improving reading comprehension). Intersubjectivity comes together with scaffolding.

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Zone of proximal development. Four stages

<http://www.ncrel.org/sdrs/areas/issues/students/learning/lr1zpd.htm>

Situating the Zone of Proximal Development

<http://www.westga.edu/~distance/ojdla/summer82/marsh82.htm>

Animation scaffolding

<http://www.coe.uga.edu/epltt/vygotskyconstructionism.htm>

These are not animations, but are good examples for iconic representations of scientific concepts
(Bruner)

<http://auc.uow.edu.au/conf/Conf96/Papers/McNaught.html>

Animation: Nerve Synapse (the same, Bruner)

<http://camel2.conncoll.edu/academics/zoology/courses/zoo202/Nervous/synapse.html>

Making sentences

<http://www.cs.fsu.edu/~jtbauer/sentence.html>