

# Developmental Psychology

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APT 2013

Educational Implications



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## Learning outcomes

- To look at how education practices were influenced by Piaget's and Vygotsky's theories
- To outline and review the empirical evidence linked to Piaget and Vygotsky's ideas of cognitive development
- To review current education practice from Piagetian and Vygotskian perspectives

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## A developmental curriculum?

- Most school curricula (particularly for the early years) claim to be 'developmental'
- But how far does the school curriculum reflect underlying processes of development?
- In designing a curriculum, it is important to understand the developmental changes that occur through infancy and childhood
- And that these inform good educational practice

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## Educational practice: The influence of Piaget

- The 1960s saw a shift from 'chalk and talk' to a 'child-centred' pedagogy
- Plowden Report (1967) 'Children and their Primary Schools'
- Its recommendations were influenced by the cognitive developmental theory of Piaget
- 'child-centred education'



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## Piaget's image of the child

- Cognitive development was **maturational**
- Development is reflected in **abilities that are innate but which are not present at birth but which appear according to an unfolding genetic blueprint**
- Development occurs through stages

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## Piaget's stage theory

- Sensory-motor stage [up to 2 years]
- Pre-operational stage [2-7 years]
- Concrete operational stage [7-11 years]
- Formal operational stage [11+ years]
  
- The child develops operation and symbolic **schemas** through a process of **assimilation** and **accommodation** [**disequilibrium** and **equilibrium**]

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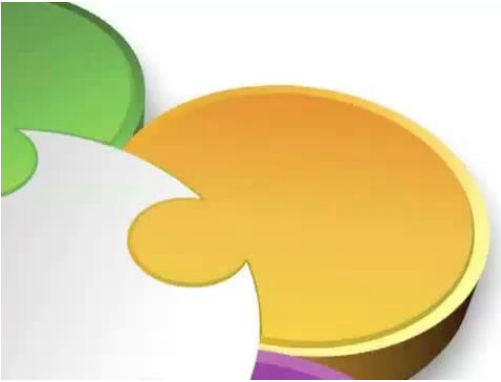
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## Piaget's image of the child

- Pre-operational → Concrete operational
- Ego-centrism → decentring
- Centrating → conserving
- The teacher's role is to provide a learning env that matches the child's stage of cog development

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## Piaget's image of the child

- The teacher encourages active construction of development, predominantly through interaction with the physical environment
- The teacher's role is to provide the best physical environment for the child to move from 'egocentrism'
- Often, in practice, through 'discovery learning' (e.g. water play, sand play)
- This is esp useful in mathematics and science teaching

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## Piaget's image of the child

- A child is presented with several wooden beads. Most are coloured white, some brown:
  - Are they all wooden beads?
  - Are there more brown or more white beads?
  - Are there more brown beads or wooden beads?
- John is taller than Susan, Susan is taller than Charlie but Jack isn't. Who is the tallest and who the shortest?

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## Piaget's image of the child

- Piaget saw the adult-child interaction as having minimal learning benefits
- His theory about the ages when these developmental milestones occur is challenged by critics largely because of the methodology he employed...
- Piaget later accepted and recognised the value of peer interaction – 'social cognition'

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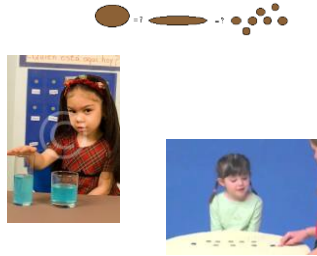
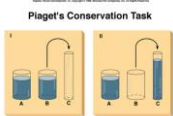
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## The effects of peers

- Piaget (1926; 1932) conservation and decentring skills can develop through interaction with peers e.g. Field...
- Peers may provide socio-cognitive conflict - opposing egocentric views
- Resolution = cognitive development
- This highlights the importance of working in pairs



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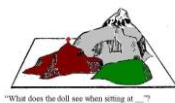
- Evaluation – Bryant (1990) – peer interaction may lead children to arrive at 'consensus' on a solution but it may not necessarily be the right one!

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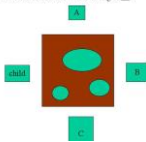
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## What's the evidence?

- Does working in pairs promote perspective taking?
- Perspective taking task:
- 5 year olds will tend to select a picture from their own perspective (Piaget & Inhelder, 1956)
- Doise & Mugny (1984) modified the task and included a 3-stage design to evaluate the effects of peer interaction

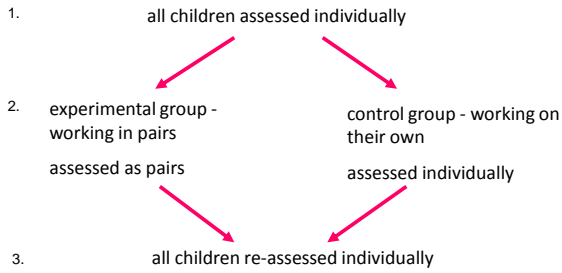


"What does the doll see when sitting at ...?"



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## 2 key questions

- At stage 2, do the experimental group perform better than the controls?
- At stage 3, does the effect of peer interaction at stage 2 have an effect on individual performance?
- Is there positive empirical evidence at both stages?
- Results – Yes!
- Similar findings for the standard conservation of liquid paradigm (Perret-Clemon, 1980)

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- But is the benefit of peer learning true with older children and with computer-based learning tasks?

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- Blaye et al (1991) found similar benefits in the learning of 11-12yr olds on a computer version of the Towers of Hanoi: paired v individual performance
- gender differences in interactive style
- boys tend to dominate when children are working in pairs at computers (Light, 1997)
- when girls are paired with each other they perform at the same level as boys; girls less likely to discuss ideas in mixed-gender groups (Underwood & Underwood, 1999)
- software issues; e.g. no gender differences in an adventure game paradigm when pirates capturing treasure were replaced with honey bears (Littleton *et al.*, 1995)

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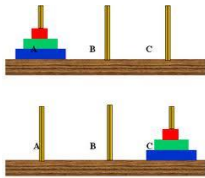
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Task – move the discs one at a time, a larger disc cannot sit on a small disc. What is the minimum number of moves to move from A to C?

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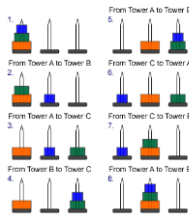
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- But is may not be peer interaction at all!

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Peer presence effects

- The presence of another child in the room working on another computer shows similar levels of cognitive benefit as children working in pairs (Light *et al.* 1994)

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## Piaget and education

- The teacher judges the child's level of CD
- S/he provides learning activities that match their stage of CD
- The teacher encourages 'discovery learning'
- Knowledge and CD develop as schemas develop
- Peer interaction is better than teacher-child interaction
- Assess individual performance

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## Lev Vygotsky (1896-1934)

- In contrast to Piaget, Vygotsky's theory is based on the social nature of learning
- Knowledge exists between individuals before it can exist within an individual
- He offers a theory of learning AND a theory of teaching



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## Learning can lead development

learning can pull development along; expert teaching promotes expert learning and advances intellectual development

'scaffolding' (structuring or simplifying the environment to assist learning). Matching this to the child's 'zone of proximal development'



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## Vygotsky's key ideas



### Knowledge is constructed

For Piaget, the child's growth of knowledge is constructed predominantly through interaction with the physical world, and this depends on their stage of cognitive development and this is largely maturational

For Vygotsky learning is best achieved in the presence of more knowledgeable others – **experts guide novices**

'Inter-mental ability' becomes 'intra-mental ability'

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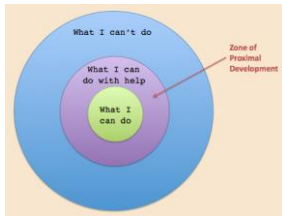
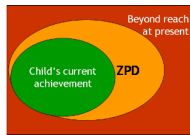
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### Language plays a central role in mental development

Language, as a cultural tool, is a mechanism for thinking

Language is used to develop higher mental functions, and includes private speech



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## Implication for education practice

- At present the primary school curriculum is in-keeping with a Piagetian approach, with children tested individually through SATS
- A Vygotskian approach would emphasise:
- collaborative, group-based learning;
- Expert guidance [Teacher, more able peer, imagined or self-talk];
- Measuring assisted as well as unassisted learning
- The teacher needs to be creative in keeping the child at the upper edge of Zone 2

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