

Piaget: Developmental Psychology

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Stages of Development

- Sensorimotor [0–2]
- Pre-operational [2–7]
- Concrete operational [7–11]
- Formal operational [11–14]

Sensorimotor Period [0-2]

- Rely on reflexes
 - Modify them to adapt to their world
- Trial & error learning
- Goal directed behavior
 - Think of alternate sequences of actions before trying to achieve a goal
- Object permanence (Transitioning)
 - Understand object under blanket has not disappeared

Pre-operational Period [2-7]

- Mentally represent events, objects (the semiotic function) and engage in symbolic play
- Ego-centric perception and communication
- One-dimensional thinking
 - Either color or shape not both
- Transition: Understand conservation

Concrete Operational Period [7–11]

- Conservation
 - number, area, volume, orientation
- Seriation
- Reversibility
- Classification
- De-centering
- Transition: Abstract and hypothetical thought

Formal Operational Period [11–14]

- Abstract thought
 - Love, Existential meaning, Shades of grey,
- Combinatorial systems
- Higher-order reasoning
 - Logical proofs
 - Deductive reasoning

Sensorimotor vs. Verbal Behavior

Sensorimotor	Verbal
Obligated to follow events without being able to exceed the speed of the action	Can represent a long chain of actions very rapidly
Limited to immediate time and space	Thought can range over large stretches of time and space
Can only represent successive or step by step acts	Can simultaneously represent all the elements of an organized structure

Language & Mode of Reasoning Correlation



Pre-operatory
(scalars)

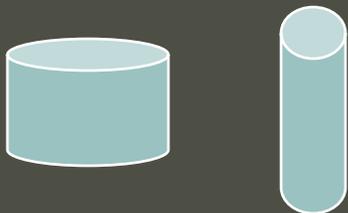
Concrete Operational
(vectors)



“this man has a big one, that man has a small one”

“this man has a bigger one than the other man”

“he has more”



“ this one has a lot, that one little”

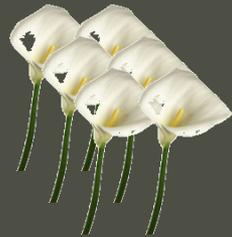
“this pencil is longer and thinner”

Obstacles of Operation

- Mentally representing what has already been absorbed at level of action
- Achieving systematic mental representation
- De-centering in physical universe
- De-centering in interpersonal or social universe

Concrete Operations

- Conservation
- Seriation [7,8]
- Classification [3– 12]
 - Organize in rows, squares, circles, etc.
 - Organize in groups, does not understand inclusion [5,6]
 - Relative sizes and inclusion [8]
- Number
- Space



Concrete Operations (cont)

- Time and speed:
 - Pre-operatory level: consider points of arrival, does not understand speed is required to catch up
 - Operational level: anticipate overtakings as well as observed overtakings
 - Hyperordinal level: Increasing or decreasing size of the intervals
 - Relate duration with distance covered

Concrete Operations (cont)

- Operations notion of time based on:
 - Seriation of events (temporal succession)
 - Duration (inclusion of intervals between events occurring at a certain point of time)
 - Temporal metrics

Causality and Chance

- White beads on one side, black on the other
 - Pre-operatory [4-6]: each bead will return to its place, or they will switch sides
 - Says beads will become unmixed.
 - After [8,9]: anticipation of mixing and awareness of improbability that beads will return to their initial position.
 - Cannot foresee outcome of individual events
 - After [12]: Understand combinations of objects

Preadolescent & Propositional Operations

- Formal Thought and Combinatorial System:
 - Formal Thought: ability to reason from truths the child has not himself experienced
 - Combinatorial System: generalization of classification operations and order relations

Preadolescent & Propositional Operations

- The Combinatorial System [12]:
 - Permutations a little later
 - Propositional Combinatorics: ability to combine ideas or hypotheses in affirmative or negative statements => understands
 - implication (if-then)
 - disjunction (either-or, or both)
 - exclusion (either-or)
 - incompatibility (either-or, or neither-neither)
 - and reciprocal implication

Formal Operatory Schemes [11,12]

- Proportions:
 - Spatial proportions (similar figures)
 - Metrical speeds ($S/T = NS/NT$)
 - Probabilities ($x/y = nx/ny$)
- Double systems of reference:
 - Understand a snail moving on a board that is moving in the opposite direction is stationary with respect to the outside world.
- Hydrostatic Equilibrium:
 - Understand the dynamics of a piston
- Notions of probability

Moral Feelings and Judgments

- Genesis of Duty – sense of obligation
 - Orders & acceptance of orders
 - Acceptance: affection combined with fear of parents
- Heteronomy
 - Before [7,8] law maker must be present for law to hold

Moral Feelings and Judgments (cont)

- Moral realism
 - Moral claims are cognitive claims
- Autonomy
 - Games
 - Younger children [< 7]: rules are a doctrine
 - Older children [>7]: rules are agreed upon and can be changed democratically
 - Justice
 - Starting at [7,8] justice becomes more important than obedience

References

- [1] "The Psychology of the Child" by Jean Piaget and Barbel Inhelder, Basic Books (Harper-Collins), 1969.
- [2] Wikipedia- Theory of Cognitive Development
http://en.wikipedia.org/wiki/Theory_of_cognitive_development