PRT – A Picture Based Test to Study the Development of Mental Rotation with Children of Different Cultures

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The Picture-Rotation-Test (PRT)

- Explores the mental-rotation ability of pre-school children (aged 4 to 6).
- Consists of 16 coloured three-dimensional pictures of animals and humans.
- Good applicability for cross-cultural use because of picture-based items and few verbal instructions.

For each picture the child is asked to compare it to three other pictures and state if they are the same or a mirrored one. Only one correct answer.

In contrast to mental-rotation tests for adults the pictures are rotated in the plane (not in depth).

Unfortunately, raw scores are not normally distributed.

Analysis of Answer Patterns

- 565 children, aged 65.07 months were tested with the PRT (Quaiser-Pohl, Rohe, & Marke, in prep.).
- Answer patterns were analyzed by verbal protocols and with Latent Class Analysis.
- Seven different solution strategies were used:
  - Non-Appropriate Strategy:
    - Always 1st Stimulus
    - Always 3rd Stimulus
    - Guessing/Comparing Details
  - Semi-Appropriate Strategy:
    - Smallest Angle Discrepancy
    - Line of Sight
  - Appropriate Strategy:
    - Holistic Strategy
    - Analytic Strategy

- The appropriateness of strategy increases with the age of the children:

Test Results as Indicator of the Developmental Stage

You can use three methods to assign the child to one of the three developmental stages:
1. Check the number of correct answers
2. Check for specific patterns on the answer sheet
3. Identify the child’s solution strategy by interview (optional)

Semi-Appropriate Strategy:
1. 3-6 correct items
2. specific pattern
3. „She looks in the same direction."

Appropriate Strategy:
1. 12 or more items correct
2. no specific pattern
3. „When I rotate the bear like this (hand movement), then it looks like this one."

Non-Appropriate Strategy:
1. about 5 correct items
2. specific pattern: (see figure for example)
3. „Because the shoes are different."

References: