What is the Raven’s Test?

Why a visual solution strategy?

Is a purely visual strategy even possible? (Our computational models say yes!)

So what?

Wechsler Scales

Information
Similarities
Vocabulary
Arithmetic
Digit Span
Letter-Number Sequencing
Block Design
Picture Completion
Digit Symbol-Coding
...

A puzzling discrepancy...


Our Central Question

Do people with autism solve the Raven’s test visually?
But first...

Is using a visual strategy on the Raven’s even possible?

What do we mean by a visual strategy anyway?

Visual inputs

Verbal representations


Our visual method

**Affine transformations**

**Visual similarity**

**Visual similarity**


**Visual algorithm**

*For each base transform T:*

Apply T to Image A.

Find translation (tx, ty) which yields best match between T(A) and B, according to:

\[ \text{similarity}(A, B) = \frac{f(A, B)}{f(B, B)} \]

Find image composition operand X as follows:

\[ \text{similarity}(A, B) = \frac{f(A, B)}{f(B, B) + a|A - B| + b|B - A|} \]

With: 1) \( a = 1, \beta = 1 \)
    2) \( a = 0, \beta = 0 \)
    3) \( a = 0, \beta = 1 \)

Choose maximum similarity value.

If maximum is (1), then \( X = 0 \).
If maximum is (2), then \( X = B - A \), and \( \oplus \) refers to image addition.
If maximum is (3), then \( X = A - B \), and \( \ominus \) refers to image subtraction.

The best-fit similitude transformation can then be specified as:

\[ [T_{\text{max}} + (tx, ty)](A) \oplus X = B \]

![Norms for typically developing children in the USA](image)

So what?
Our work shows **sufficiency** of these particular visual representations, not **necessity**.

We have shown that one **could** use a purely visual strategy on parts of the Raven’s test.

Whether one **does** is still an open question.