Dr. Tupler

Pixel-Based Approach
(Problems)

Scanning the original stimulus card of the Rey-Osterrieth Figure using an HP ScanJet 8300 scanner reveals:

- 8-pixel-wide lines (which introduces additional complexity of measurement)
- A slight imperfection (by 2 pixels) believed to originate from the official stimulus card, not the scanning process
- The drawing is technically possible but extremely difficult to achieve perfection in view of the connection of the Diamond (item 14) to the Triangle on the Right (item 13) relative to the thickness of the lines
Pixel-Based Approach
(A solution)

• Recreation of a “perfect” Rey-Osterrieth stimulus with 1-pixel-wide lines (and circle)
• The constraints of 1 pixel and the connection between items 13 and 14 results in only 1 possible “perfect” Rey-Osterrieth figure.
• Measurements of this figure, which overlays perfectly with the original corrected figure, yields the exact dimensions of the Rey-Osterrieth in pixels (96 pixels = 1 inch), which is the preferred unit of micro-analysis (rather than inches, although inches are used to meet exact specifications of the scoring manual).
• Accessing the Image.Canvas.Pixels(x,y) property in Delphi (Object Pascal) on the .bmp image combined with the exact dimensions determined previously allows an entirely automated approach to scoring the Rey-Osterrieth.
• Combination with temporal, Z axis, and N force data, as well as rate, acceleration, and other derived parameters will enhance the precision of the Delphi coding and allow a number of derived indices of motor behavior that may be examined for learning and skill acquisition.
Pixel-Based Approach
(A solution)

• Identify all linear components
• Compare slopes, angles, discontinuities, and motor-control topographies
• Identify all non-linear components: circle, dots within circle, random lines or other motor errors
• Apply measures of circularity
• Apply measures of dot production
• Translate these more fundamental motor-control measures into the traditional 0-, .5-, 1-, and 2-point scoring system or other scoring systems (e.g., those emphasizing sequencing).
Pixel-Based Approach
(A solution)

• Find point farthest to NW
• Sherman’s march, linear only
• Identify any points not continuous, which should detect the circle
• They are tracked as a circle, and the number of pixels inside is counted
• Determine circularity of circle
• Center point determined by mean X, mean Y
• Mean diameter = [(N-most Y – South-most Y) + (E-most X – W-most X)]/2