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## **DEVELOPMENT AND RELATIONSHIP BETWEEN PERFORMANCE AND THE DRAWING PROCESS ON THE BENDER-GESTALT TEST AS ANALYZED USING THE DIGITAL PEN**

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### **Abstract**

This study investigated the developmental changes and characteristics in children's Bender-Gestalt Test, including not only the finished drawing (size, the number of strokes, and their preciseness in copying [i.e., total scores]), but also the drawing process (duration, speed, and pressure). Developmental changes and the relationship between the method of drawing and the Bender-Gestalt Test score were also examined. Our research utilized a high-technology interface 'digital pen' (Anoto DP201) and paper, which converts handwritten analog information created by the pen and paper into digital data and stores it in its built-in memory. Seventy 4-to 6-year-old Japanese preschoolers (34 boys and 36 girls) were asked to copy the Bender-Gestalt Test figures with the digital pen. Results showed the developmental changes and the relationship between the performance of copying the figures and drawing process; the older children drew smaller figures more slowly with stronger pressure, and that the children who drew figures more slowly displayed better Bender-Gestalt Test total score. Sex differences were found in total stroke length and average pressure; girls drew smaller figures with stronger pressure than boys. This study showed that the drawing tests provided more valuable information by analyzing *how* the participants drew in addition to *what* they drew.

**Keywords:** Bender-Gestalt Test, Japanese Preschoolers, Drawing Process, Digital pen

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