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## Associations Between Sensory Processing and Irritability in Prader-Willi Syndrome: Beyond Genetic Subtypes and Clinical Backgrounds

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### Abstract

**Irritability is a core challenge in Prader-Willi syndrome (PWS).** This study investigated the independent contribution of sensory processing to irritability while controlling for clinical and genetic backgrounds in a cohort of 101 individuals with PWS (77 deletion, 24 maternal uniparental disomy [mUPD]). Caregivers completed the Japanese version of the Short Sensory Profile (SSP-J) and the irritability subscale of the Aberrant Behavior Checklist (ABC-J). Hierarchical multiple regression analysis was performed. In Step 1, age, sex, genetic subtype, and psychotropic medication use explained 22.3% of irritability variance ( $R^2 = 0.223$ ,  $p < 0.001$ ). Adding sensory variables in Step 2 explained an additional 38.2% ( $\Delta R^2 = 0.382$ ,  $p < 0.001$ ), totaling 60.6% ( $R^2 = 0.606$ ). Auditory filtering ( $\beta = 0.262$ ), under-responsiveness/seeking sensation ( $\beta = 0.201$ ), and visual/auditory sensitivity ( $\beta = 0.194$ ) were significant independent predictors ( $p < 0.05$ ). Notably, the effect of the mUPD subtype became non-significant after accounting for sensory variables. **Sensory processing is a robust predictor of irritability, independent of genetic subtype and medication. Evaluating sensory profiles is essential for environmental adaptations and behavioral interventions in PWS.**

**Keywords:** Prader–Willi syndrome; genetic subtype; hierarchical regression; irritability; sensory processing.

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