

The Perceptual Limit in the Development of Reading Speed

Thursday, September 11, 2025 3:50 PM (10 minutes)

Reading development depends on the integration of perceptual and cognitive processes. Visual crowding—interference from nearby flankers that impairs target recognition—correlates with reading speed in both typical and dyslexic readers (Pelli et al., 2007; Pelli, 2016; Spinelli et al., 2001; Martelli et al., 2009). Although research suggests that crowding affects reading acquisition, its developmental trajectory remains unclear. This study aims to clarify how crowding evolves during childhood and relates to reading fluency.

We assessed visual acuity, foveal and peripheral crowding, and reading speed (via functional reading tests and the Rapid Serial Visual Presentation procedure) in 133 Italian children from first to fifth grade, all with age-appropriate reading skills.

Testing was conducted using *EasyEyes* (Pelli, 2021), a browser-based tool for precise crowding measurement. Grade level was negatively correlated with peripheral crowding in both the left ($r = -0.323$, $p = .002$) and right ($r = -0.384$, $p < .001$) visual fields, and with foveal crowding ($r = -0.256$, $p = .008$), indicating a developmental reduction. Grade also positively correlated with reading speed ($r = 0.362$, $p < .001$). Additionally, reading speed (words per minute) negatively correlated with foveal acuity ($r = -0.252$, $p = .009$) and right-field peripheral crowding ($r = -0.223$, $p = .021$).

These findings suggest that both foveal and peripheral crowding decrease with age and are linked to improved reading, underscoring the role of visual crowding in the development of fluent reading.

Keywords: (Reading development; perceptual integration)

If you're submitting a symposium talk, what's the symposium title?

If you're submitting a symposium, or a talk that is part of a symposium, is this a junior symposium?

No

Primary authors: MARRUCHELLI, Roberta (Department of Psychology, Sapienza University of Rome, Italy); AGOSTINI, Francesca (Department of Psychology, Sapienza University of Rome, Italy); PELLI, Denis (Department of Psychology and Neural Science, New York University, USA); MARTELLI, Marialuisa (Department of Psychology, Sapienza University of Rome, Italy)

Presenter: MARRUCHELLI, Roberta (Department of Psychology, Sapienza University of Rome, Italy)

Session Classification: Attention / Language

Track Classification: Language, reading and music