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Word Length Effects and the Serial vs. Parallel Debate in Connectionist Models of Reading Aloud

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Abstract: In reading aloud, naming latency (i.e., reaction time) increases linearly as the number of written symbols in a word increases (e.g., Rastle, Havelka, Wydell, Coltheart, & Besner, 2009). Advocates of dual-route models have argued that these effects can be accounted for by connectionist models that have a serial processing component, but not by models that are completely parallel when a single fixation is assumed. However, this conclusion is valid only for the specific assumptions made in parallel models implemented to date, and is not valid more generally. As Townsend and colleagues (Snodgrass & Townsend, 1980; Townsend, 1972) have argued, parallel models can mimic linearly increasing RTs as the number of items to be processed increases if stochastic processing times, limited processing capacity (i.e., attention), and a self-terminating stopping rule (i.e., the criterion to initiate articulation corresponding to the segment) are considered.