

## **UC Merced**

### **Proceedings of the Annual Meeting of the Cognitive Science Society**

#### **Title**

The effect of language impairment on non-symbolic exact quantity representation

#### **Permalink**

<https://escholarship.org/uc/item/1255j43c>

#### **Journal**

Proceedings of the Annual Meeting of the Cognitive Science Society, 38(0)

#### **Authors**

Verbos, John

Wallace, Sarah

Kranjec, Alexander

#### **Publication Date**

2016

Peer reviewed

# **The effect of language impairment on non-symbolic exact quantity representation**

**John Verbos**

Duquesne University, Pittsburgh, PA, USA

**Sarah Wallace**

Duquesne University, Pittsburgh, PA, USA

**Alexander Kranjec**

Duquesne University, Pittsburgh, PA, USA

**Abstract:** Both English-speakers whose access to number language is artificially compromised by verbal interference and the Pirahã (an Amazonian tribe without exact number words) appear to rely on analog magnitude estimation for representing non-symbolic exact quantities greater than 3. Here, 10 participants with aphasia from stroke performed the same 5 counting tasks from these previous studies. Performance was poorest when targets were not visible during response (70% correct) and best when targets were presented as subitizable groups of 2 and 3 (98% correct). Western Aphasia Battery-Revised subtest scores were reliably correlated with performance across counting tasks suggesting ways that both speech and naming may contribute to errors. Coefficients of variation for particular tasks, and significant correlations between target magnitude with both error rate and size across tasks suggests use of analog magnitude estimation for verbally impaired participants. Diverse forms of language impairment may contribute to errors on nonverbal counting tasks.