

UC Merced

Proceedings of the Annual Meeting of the Cognitive Science Society

Title

Coordination dynamics in speech and lexical semantics

Permalink

<https://escholarship.org/uc/item/9pk3c44g>

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 32(32)

ISSN

1069-7977

Authors

Kello, Christopher
Rhodes, Theo
Hollis, Geoff
et al.

Publication Date

2010

Peer reviewed

Coordination dynamics in speech and lexical semantics

Christopher Kello

University of California, Merced

Theo Rhodes

University of California, Merced

Geoff Hollis

University of Cincinnati

Bryan Kerster

University of California, Merced

Abstract: Variations in individual human behavior are intrinsically long-range correlated (i.e. $1/f$ noise). These correlations may reflect interdependence (i.e. coordination) among components at various scales of structure and dynamics (e.g., neurons, cortical columns, brain areas, brain-body interactions). Two experiments tested whether long-range correlations emerge when two people interact. In experiment 1, perceptual-motor coordination was invoked by instructing participant pairs to coordinate uttering the word "mom" in alternation with key taps. In experiment 2, semantic coordination was invoked by alternating free word associations (e.g. one says "cat", the other says "dog", first says "collar", second says "shirt", and so on). Fluctuations in series of mom-tap intervals were long-range correlated. Long-range correlations were also found in semantics fluctuations of free word associations, the latter being weaker and derived from lexical co-occurrence statistics. Results indicate that common principles of coordination apply across individual and dyadic scales of perceptual-motor and cognitive performances.