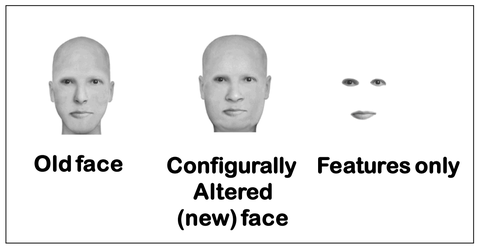

A Snake Wiggle of Reaction Time Functions to Indicate Holistic Perception

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Introduction

We analyzed the underlying fundamental processes engaged in forming holistic perceptual representations. The subjects participated in a face categorization task over multiple sessions. We applied the systems factorial technology (SFT) to analyze the properties of the observed response time (RT) distributions. The key statistic was a survivor interaction contrast function (SIC). Over the course of extensive practice, the observed SICs exhibited a specific pattern of shape transformations that could be described as a "snake wiggle". The observed SIC signature indicated that the processing mechanism behind holistic perception relies on strong positive facilitation between feature detectors, within the parallel mental network. The converging evidence is provided by the additional qualitative RT test (Fific, Little & Nosofsky, 2010).

Defining holism/configurality in terms of processing characteristics: Systems factorial technology (SFT)

- Parallel, or coactive architecture
- Mandatory exhaustive stopping rule
- Super-capacity
- Interdependencies between feature detectors

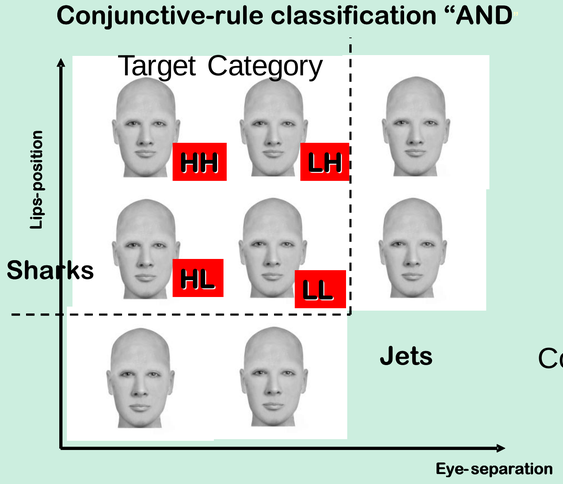
The main SFT statistic

Survivor interaction contrast (SIC):

$$SIC(t) = S_{ll}(t) - S_{lh}(t) - (S_{hl}(t) - S_{hh}(t))$$

Experimental study

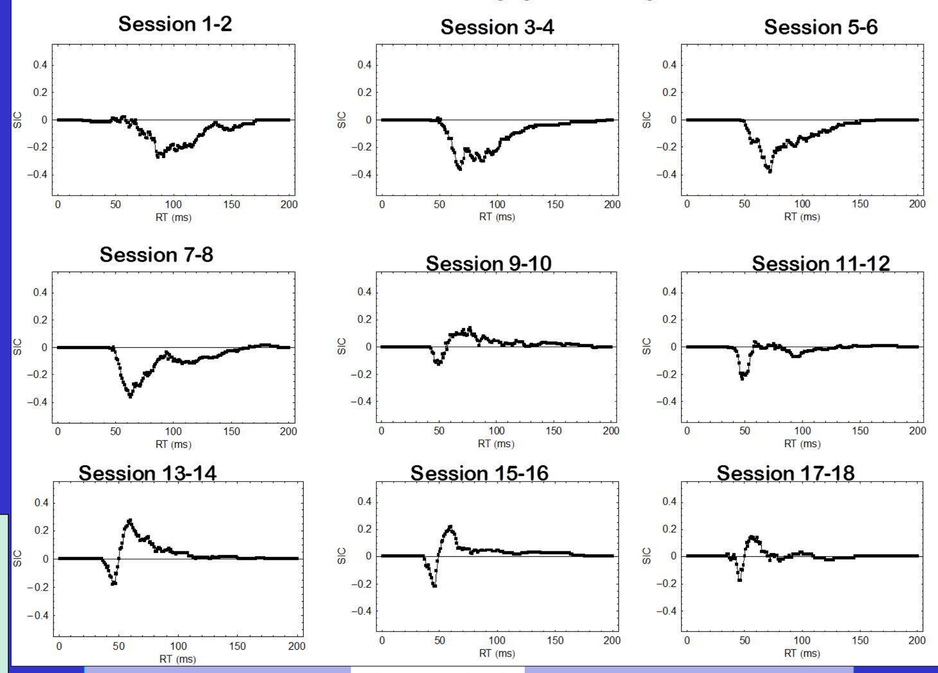
Conjunctive-rule classification "AND



(Fific & Townsend, 2010)

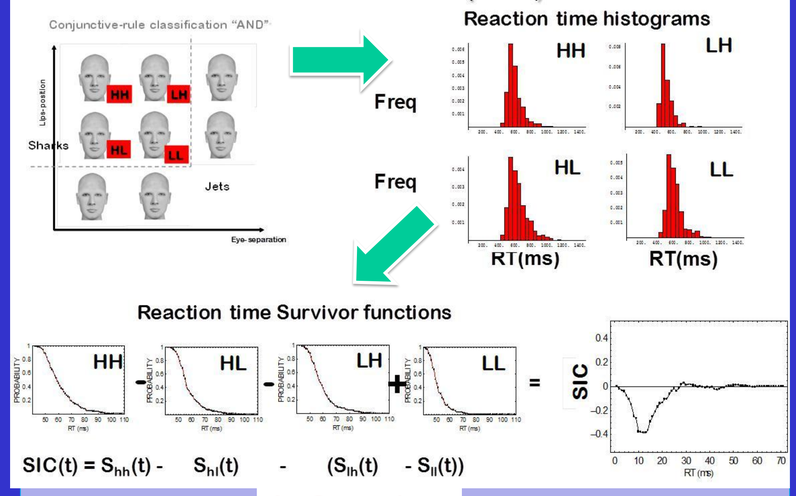
Phenomenon

The "Snake Wiggle" signature



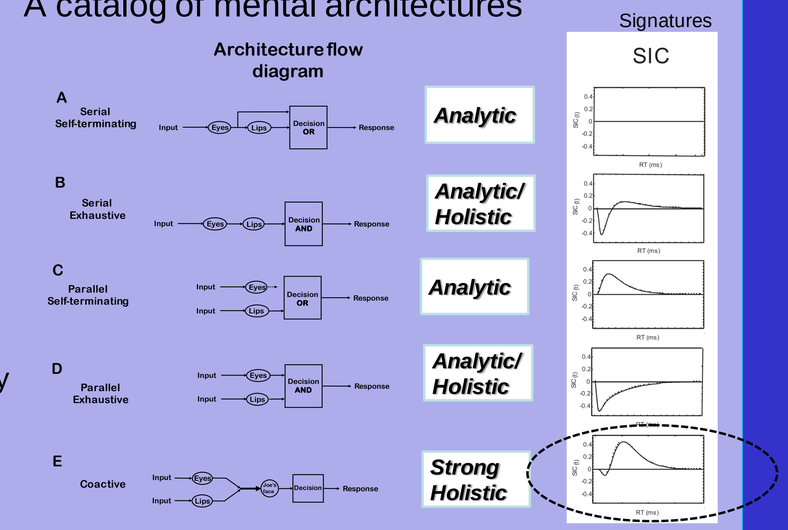
Tutorial

Tutorial: how to calculate the survivor interaction contrast (SIC) function

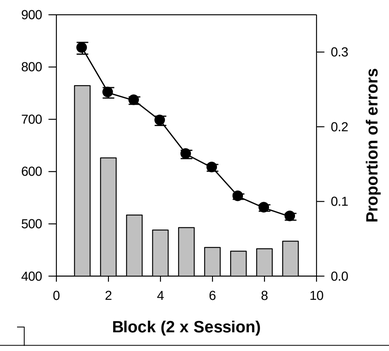


A Catalog

A catalog of mental architectures

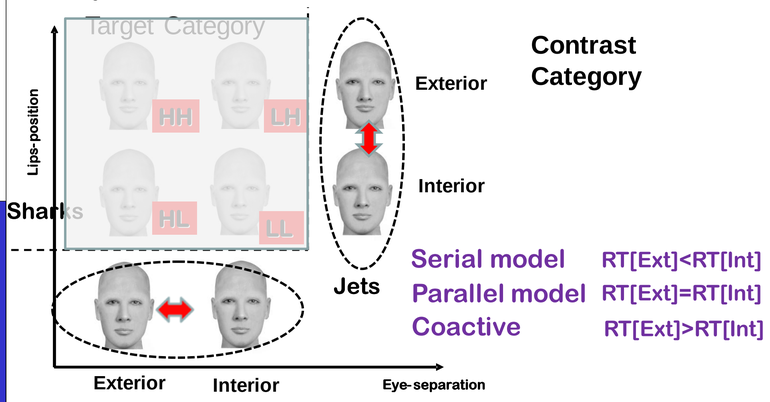


Mean RT trend

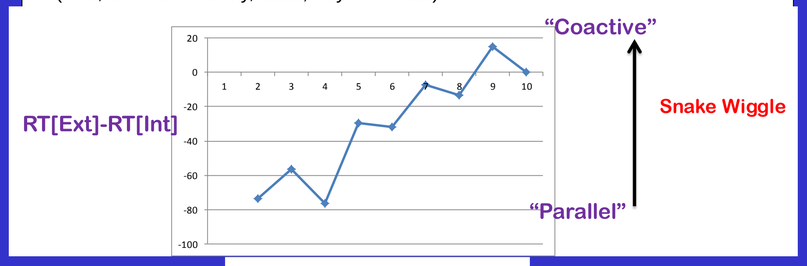


Converging evidence

Conjunctive-rule classification "AND



(Fific, Little & Nosofsky, 2010; Psych Review)



Conclusions

- Let's wiggle: The SIC function wiggles its way to S-shaped positive function
- Robustness: All subjects wiggled
- Coactivation: The target signature is Coactive, an indicator of strong holism
- Performance superiority: Mean RT decreases, and accuracy improves
- Introspection: The verbal reports
- Contrast faces wiggled to coactivation, too.
- The snake wiggle is a dynamic signature of holistic perception

Recommended Readings

Fific, M., Little, D. R., & Nosofsky, R. M. (2010). Logical-rule models of classification response times: A synthesis of mental-architecture, random-walk, and decision-bound approaches. *Psychological Review, 117*, 309–348.

Fific, M., & Townsend, J. T. (2010). Information-processing alternatives to holistic perception: Identifying the mechanisms of secondary-level holism within a categorization paradigm. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 36*, 1290-1313.

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