

Neighborhood Density in Naturalistic Word Learning

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Word Learning

- Children rapidly acquire new words
- Able to associate word form with the referent after 1 exposure
 - Fast mapping
- Initial representations retained and elaborated

Influence of Existing Representations

- New words learned in the context of known words
- Representations of new words must be integrated with existing representations
- Structure of memory may influence acquisition

Structure of the Lexicon

- Semantic
 - Representation of meaning
 - chair – “furniture for sitting”
- Lexical
 - Representation of whole word form
 - chair -- /tʃeɪr/

Structure

- Representations are not isolated
- Connections among related representations
- Similarity relationships may influence acquisition

Semantic Similarity

- Semantic set size
- Number of different words generated by two or more people in response to a given word
- sit – stand, chair, down, relax, rest
- Large vs. small set size

Effect of Semantic Set Size

- Cued recall
 - Study a list of words
 - Recall words with the support of a cue
- Small set size advantage
 - Words with few associates are recalled better

Lexical Similarity

- Neighborhood density
- One phoneme substitution, deletion, addition
- Sit – pit, set, sick, it, spit
- High vs. low density

Density Effect

- Word recognition studies
 - Judge word pair as “same” or “different”
 - Lexical decision
 - Repeat the word
- Low density advantage
 - Words with few neighbors recognized faster

Does semantic and/or lexical structure influence naturalistic word learning?

- Similarity could be harmful
- Similarity could be helpful

Word Learning Database

- Mac Arthur Communicative Development Inventory Norms (Dale & Fenson, 1996)
- Infant (8-16 months)
 - 396 words
 - Comprehension
 - Production
- Toddler (16-30 months)
 - 680 words
 - Production

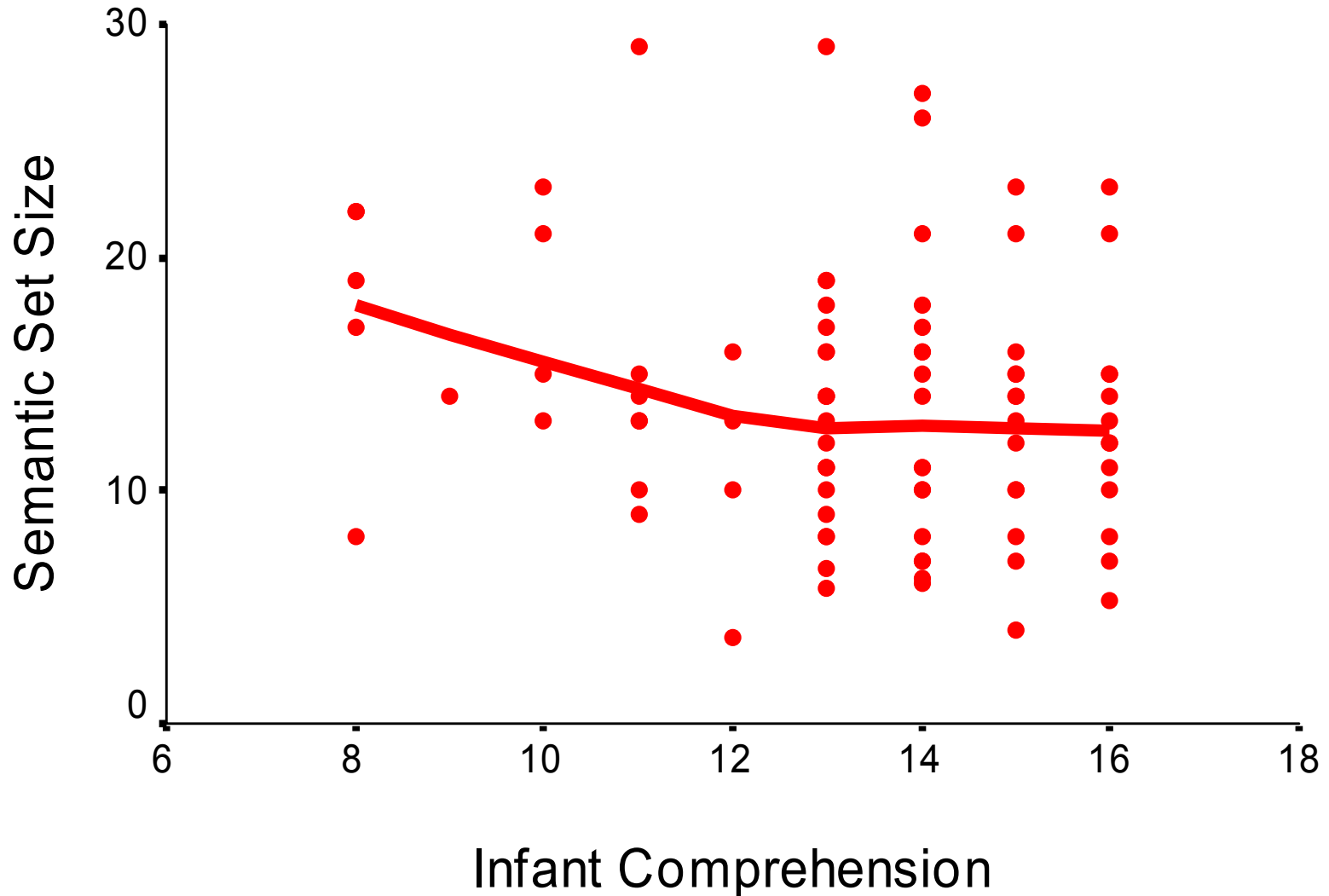
Variables

- Age-of-Acquisition
 - Earliest age when $\geq 50\%$ of children “know” word
- Semantic set size (Nelson, McEvoy, & Schreiber)
- Neighborhood density
- Word Frequency (Moe, Hopkins, & Rush)
- Word length

Results

- Linear regression
- Infant production
 - Not enough data (n=13)
- Infant comprehension
 - Semantic set size significant

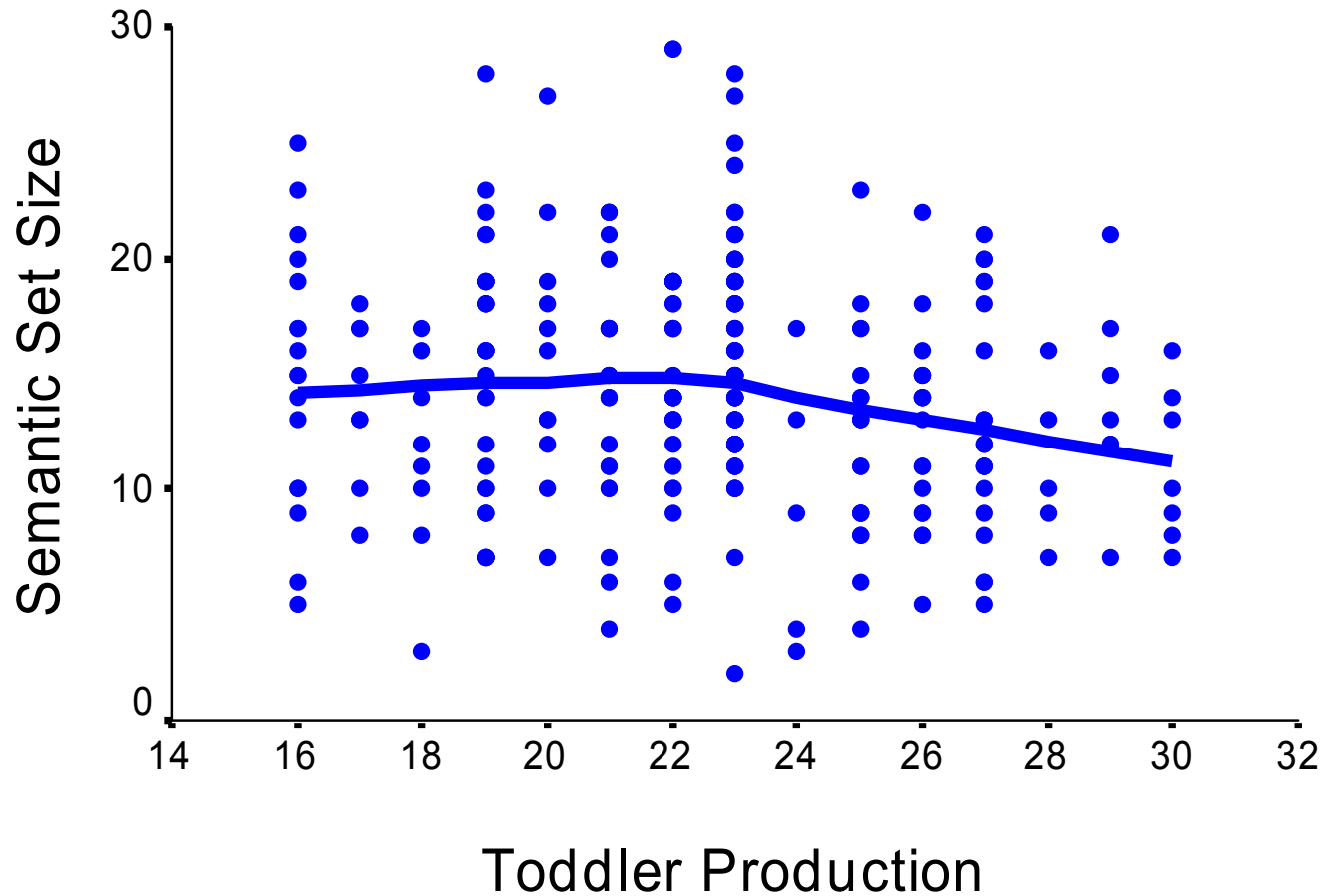
Large Set Size Acquired Early



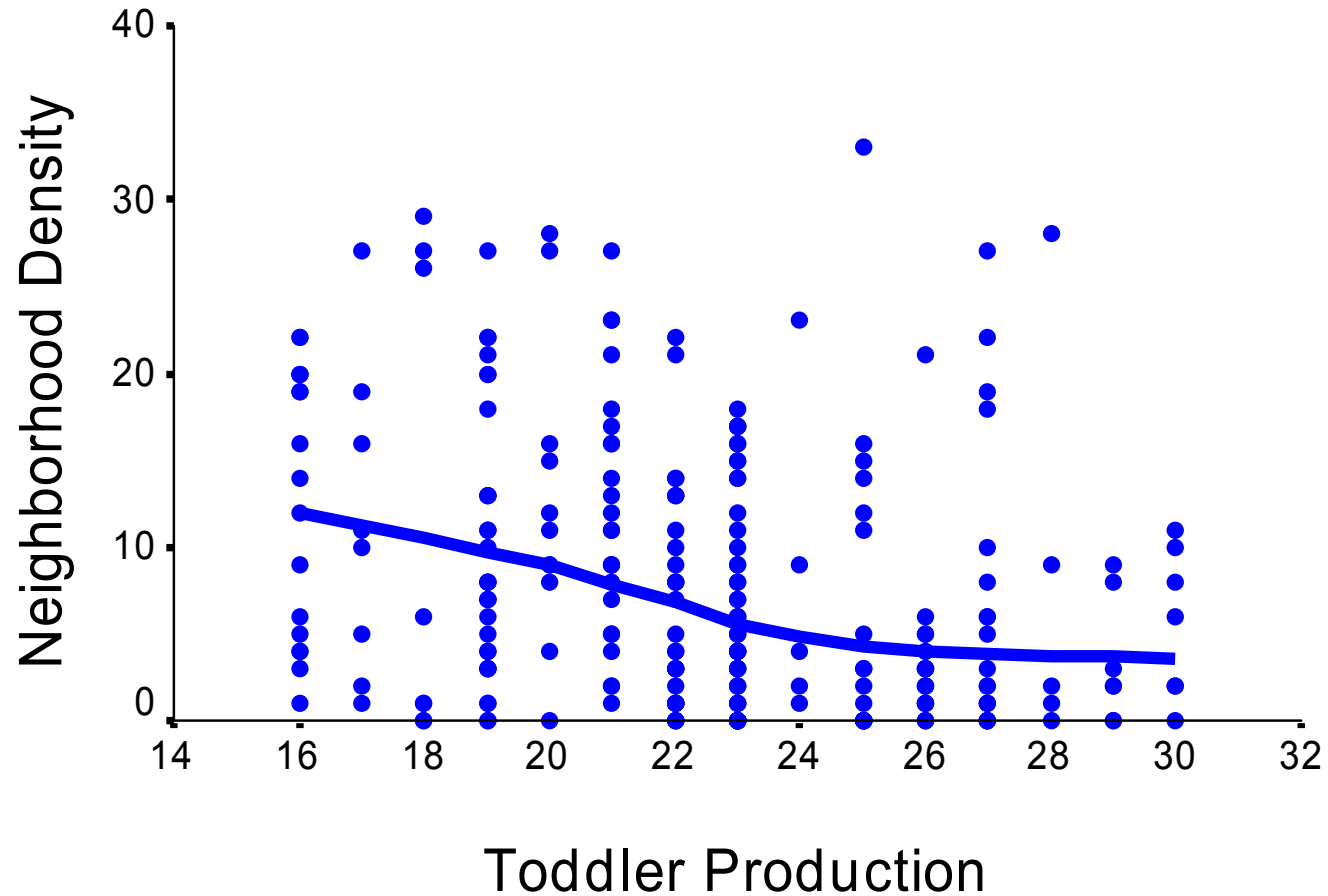
Results (cont)

- Toddler production
 - Semantic set size significant
 - Neighborhood density significant

Large Set Size Acquired Early



High Density Acquired Early



Summary

- Similarity to known words influences acquisition
 - High similarity facilitates acquisition
 - Connections to many known words
- Different representations influential x development
 - Semantic influences early
 - Lexical influences later

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