Understanding word learning with computational models

Micha Elsner, Department of Linguistics
The Ohio State University

Psychologists and linguists believe infants can recognize many words even before they begin to talk...

tell English from Japanese

own name, 'Mommy'

'apple', 'cup'

'for', 'the'

'gone', 'eat'

first spoken words

50 spoken words

rapid word learning

birth 6 months 1 year 2 years

How do they learn all these words? Words can run together...
Researchers have different theories about the clues that babies use:

Stress: most words have only one stress, on the first syllable:

li - on hor - sie

But words like *a* or *the* rarely get stressed, and some words break the rules...

the bed ba - lloon

Repetition: patterns that occur over and over might be words:

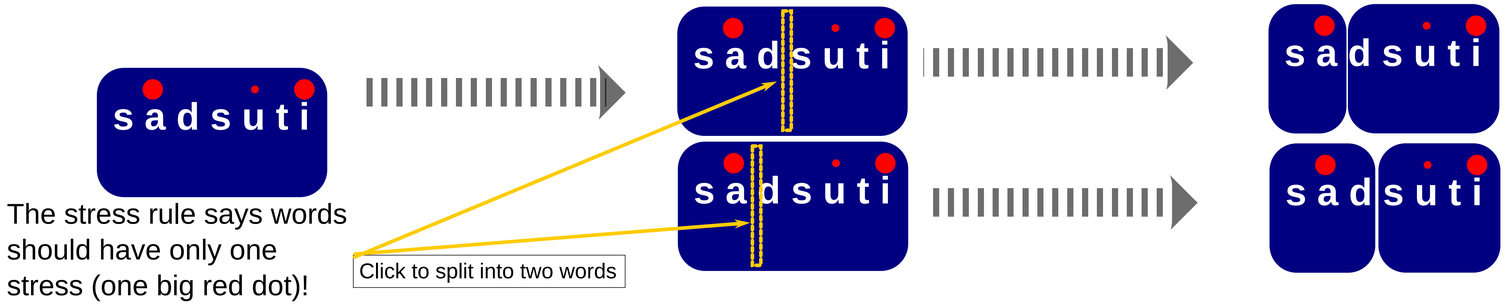
itsyourdoggie! doesthewolflooklikeadoggie? thedoggiesayswoofwoof!

Sound patterns: some sounds can't occur at the beginnings or ends of words:

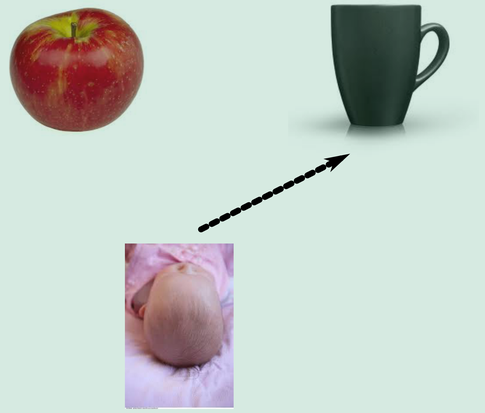
make sense (ksense?) I'm big (mbig?)

Other languages allow these sound combinations: *Kseniya* (Russian), *Mbeki* (Xhosa)

How far can these simple cues get you? What's still missing?
Try the demo to see how stress and repetition help discover words!



Look at the cup!



How can we tell what words a baby knows— before they start talking?

Babies who know the word *cup* will look at the right picture more often...

Scuse me while I kiss this guy!

Words run together, and it's hard to hear where they begin and end

Babies learn words despite these potential mishearings...

but how do they do it?

Computer programs that learn words

I write programs to see which words you can find with rules like these

I want to understand how babies learn

And maybe improve speech recognition software!