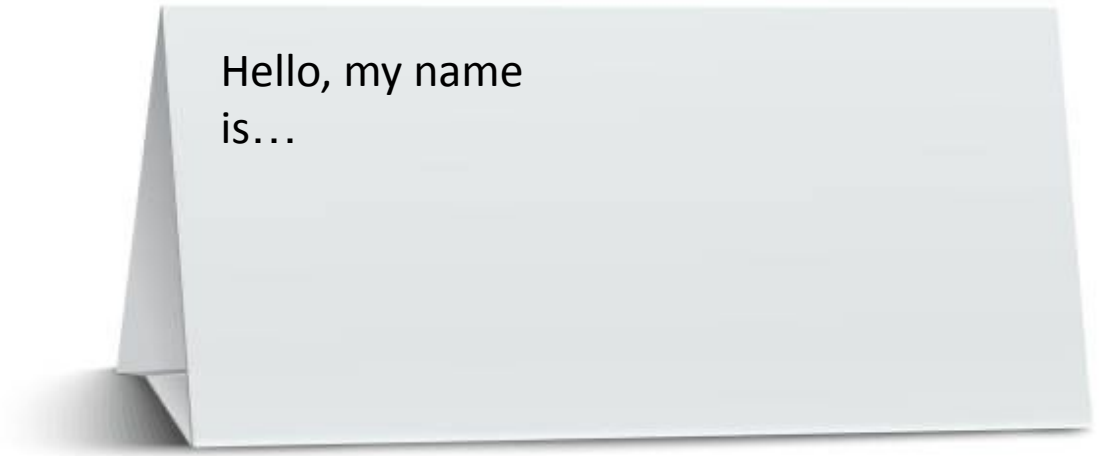
Welcome! As you come in…

- Grab a piece of paper and marker
- Make a name card
  - Fold paper in half and write your name and pronouns (optional) CLEARLY on one side of the paper
- Return the marker or give it to someone else



PSY 254
Precept 1

AI/Preceptor: Alexander Ku
alexku@princeton.edu
He/him/his

Today's agenda

- Introductions
- Precept expectations
- Why study developmental psychology?
- How to read a scientific article

About me

2nd year PhD in psychology and neuroscience
Lab: Computational Cognitive Science Lab
PI: Tom Griffiths

Undergrad and masters:

Berkeley
UNIVERSITY OF CALIFORNIA
Electrical Engineering and Computer Sciences

Last few years:

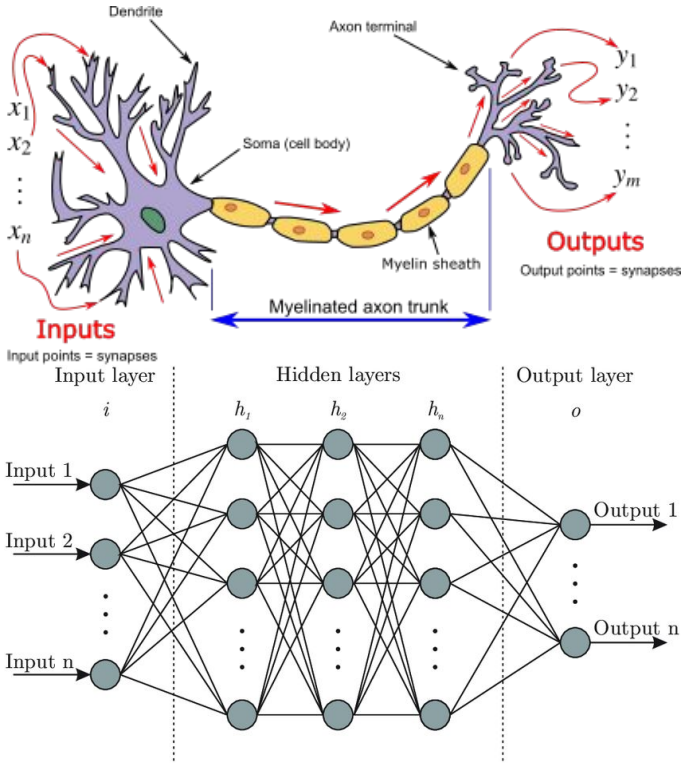
Google DeepMind

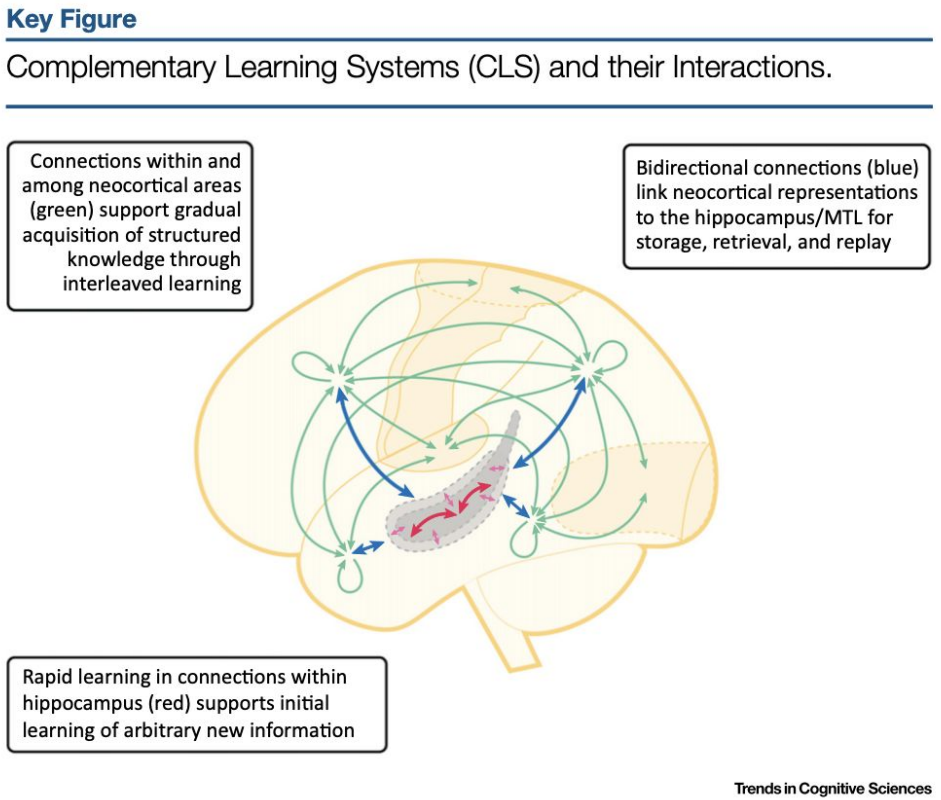
Was living in NYC before Princeton

Grew up in Palo Alto, CA

Spent quarantine in Seattle, WA

Computational models of memory and learning





What computations take place in the brain during learning and memory formation

How do interactions between different memory systems facilitate learning?

Get to know you, and each other

With your partner, figure out 1 thing in common between you that won't apply *to anyone else in the room.*

E.g., You both have lived in Antarctica.

Today's agenda

- ~~Introductions~~
- Precept expectations
- Why study developmental psychology?
- How to read a scientific article

Precept structure

- A precept is a discussion group!
  - NOT for reviewing lectures
  - Please do the readings before you come into class! We will be discussing the readings at the beginning of each precept
- Grades:

20%: midterm exam
20%: final exam
30%: journal article
30%: precept: *10% active participation*
10% media/art project
5% app/toy/book evaluation
5% attendance (You may miss 1 precept without an excuse. If you miss 3 or more without an excuse, you will fail the course.)

What you can expect from me

- Precept Slides Prior to Class
- Office hours: Thursdays from 2-3pm at PSH 321
  - Come in with or email me clear, concise questions
  - Zoom will be open: https://princeton.zoom.us/my/alexku
- Responsive to emails: alexku@princeton.edu
  - Will respond within 1 business day
  - Won't respond to emails within 1 business day of exams
- Respectful of your feedback/suggestions

What I expect of you

- You are welcome to wear a mask if you like
- Lively participation and discussion (10% of grade)
  - No need to raise hands, just speak up BUT let others speak too
  - *If you prefer, you can email me your thoughts prior to the precept, and I will voice them anonymously*
- Assignments on time
  - Weekly MCQ
  - Course policy is 20% off per day late
- Use of respectful language and consideration for everyone in class

Today's agenda

- ~~Introductions~~
- ~~Precept expectations~~
- Why study developmental psychology?
- How to read a scientific article

Why study developmental psychology?

Take a moment to write down some thoughts.

Why study developmental psychology?

To understand what human knowledge is made of.

To understand why commonsense reasoning seems easy.

To answer an age-old question: when does learning start?

To understand why individual children differ so much in their responses to similar environments.

To design effective social policies.

Also, babies are weird!

Also, babies are weird!

Today's agenda

- ~~Introductions~~
- ~~Precept expectations~~
- ~~Why study developmental psychology?~~
- How to read a scientific article

What’s in a scientific article?

- Abstract
- Introduction
- Method
- Results
- Discussion

What's in a scientific article?

Brief article

All words are not created equal: Expectations about word length guide infant statistical learning

Title: broad summary of experiment

Casey Lew-Williams *, Jenny R. Saffran

Department of Psychology and Waisman Center, University of Wisconsin-Madison, United States

ARTICLE INFO

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Infant language learning
Word segmentation
Transfer
Prior experience

ABSTRACT

Infants have been described as 'statistical learners' capable of extracting structure (such as words) from patterned input (such as language). Here, we investigated whether prior knowledge influences how infants track transitional probabilities in word segmentation tasks. Are infants biased by prior experience when engaging in sequential statistical learning? In a laboratory simulation of learning across time, we exposed 9- and 10-month-old infants to a list of either disyllabic or trisyllabic nonsense words, followed by a pause-free speech stream composed of a different set of disyllabic or trisyllabic nonsense words. Listening times revealed successful segmentation of words from fluent speech only when words were uniformly disyllabic or trisyllabic throughout both phases of the experiment. Hearing trisyllabic words during the pre-exposure phase derailed infants' abilities to segment speech into disyllabic words, and vice versa. We conclude that prior knowledge about word length equips infants with perceptual expectations that facilitate efficient processing of subsequent language input.

Published by Elsevier B.V.

Abstract: more detailed summary of experiment

Introduction: Background info (what research has been done, what remains unknown, why it is important to address, how will authors address it), Predictions

1. Introduction

Smith (2000) describes learning as a historical process. Learners do not simply make connections between stimulus events. Instead, "the formation of initially simple associations changes what is attended to and, in doing so, changes what will be learned in the future" (p. 172). There

2008), and classroom education (Ennis, 1992). This approach to learning has also dominated research on second language learning for decades, yielding a highly robust and convergent finding: an individual's first language knowledge shapes and constrains acquisition of a second language (e.g., Bates & MacWhinney, 1981; Lado, 1957; Lew-Williams & Fernald, 2010; Nemser, 1971). Here we

What's in a scientific article?

ferred disyllabic or trisyllabic segmentations, imposing an apparent bias for shorter units. Indeed, English words are short relative to some languages, including Spanish: the 680 words included on the *MacArthur-Bates Inventario del Desarrollo de Habilidades Comunicativas* are a mean 2.7 syllables in length (vs. 1.7 syllables in English). In contrast, words in Mandarin Chinese are predominantly monosyllabic. Across time, experience with shorter vs. longer words may lead infants to form perceptual expectations for future language input, and thereby impact statistical learning from fluent speech.

The current study was designed to determine whether we could change infants' expectations about where words begin and end in a statistical learning task. Does prior experience mediate the deployment of language learning detection of trisyllabic words relative to disyllabic words in fluent speech. Similarly, pre-exposure to disyllabic words should facilitate detection of disyllabic words relative to trisyllabic words. This outcome would indicate that prior experience shapes statistical learning.

2. Method

2.1. Participants

Participants were 96 healthy, full-term infants (43 female) from monolingual English-speaking households. Infants ranged in age from 9.0 to 10.9 months (M = 10.0 months), matching the approximate age of

Method:
how was study carried out?
(participants, stimuli, procedure)

Results:
What are the research findings?
(objective results, statistical analysis techniques, graphs)

3. Results

Our initial analysis was designed to ensure that the length of words in the speech stream (disyllabic vs. trisyllabic) did not influence ease of segmentation. Looking times were analyzed in a 2 × 2 mixed ANOVA with segmentation language (disyllabic, triyllabic) as a between-subjects factor, and item (word, part-word) as a

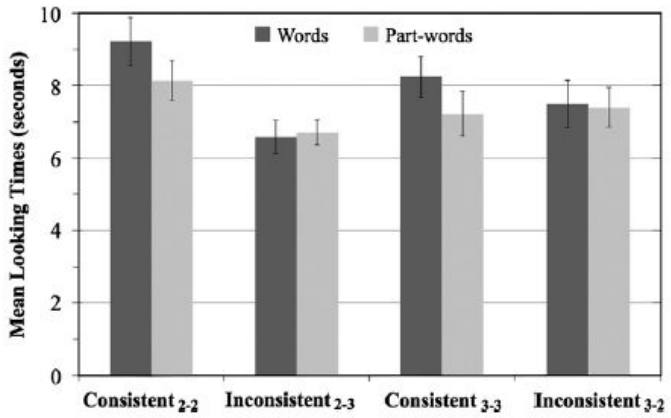
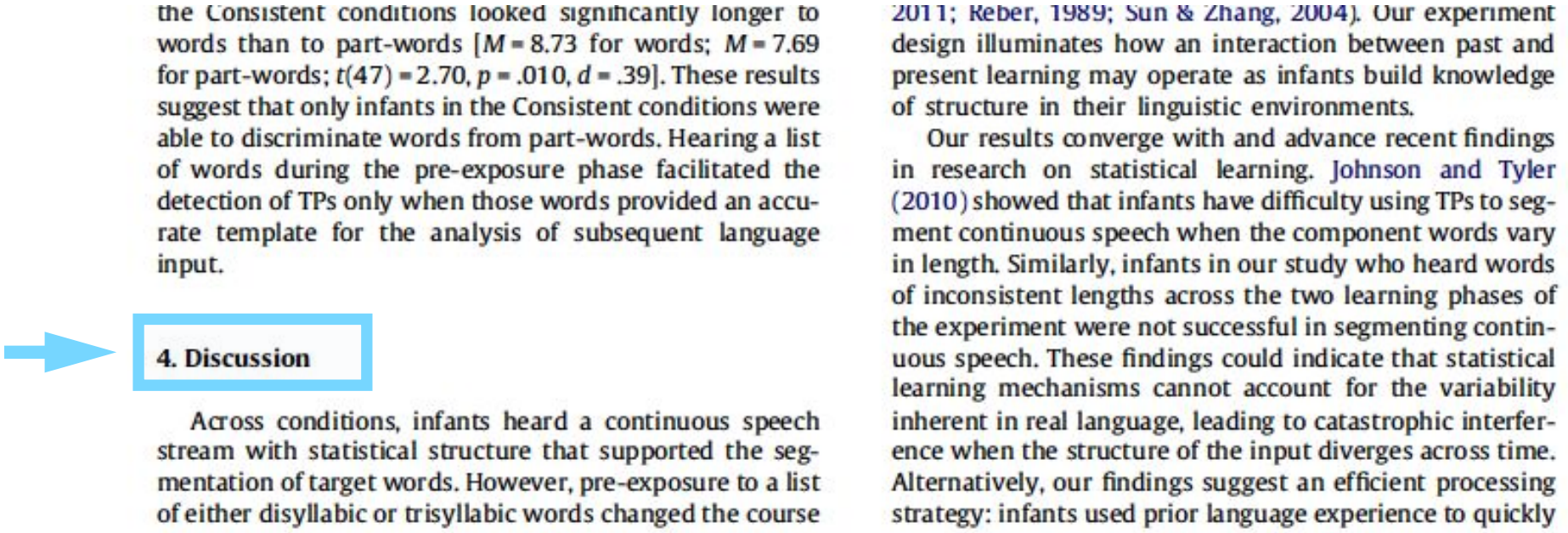


Fig. 2. Mean looking times to words and part-words in the four conditions. Error bars represent standard errors of the mean.

What's in a scientific article?

Discussion: what do the findings mean? (interpretation, possible limitations, future directions for research)



the Consistent conditions looked significantly longer to words than to part-words [$M = 8.73$ for words; $M = 7.69$ for part-words; $t(47) = 2.70$, $p = .010$, $d = .39$]. These results suggest that only infants in the Consistent conditions were able to discriminate words from part-words. Hearing a list of words during the pre-exposure phase facilitated the detection of TPs only when those words provided an accurate template for the analysis of subsequent language input.

4. Discussion

Across conditions, infants heard a continuous speech stream with statistical structure that supported the segmentation of target words. However, pre-exposure to a list of either disyllabic or trisyllabic words changed the course

2011; Reber, 1989; Sun & Zhang, 2004). Our experiment design illuminates how an interaction between past and present learning may operate as infants build knowledge of structure in their linguistic environments.

Our results converge with and advance recent findings in research on statistical learning. Johnson and Tyler (2010) showed that infants have difficulty using TPs to segment continuous speech when the component words vary in length. Similarly, infants in our study who heard words of inconsistent lengths across the two learning phases of the experiment were not successful in segmenting continuous speech. These findings could indicate that statistical learning mechanisms cannot account for the variability inherent in real language, leading to catastrophic interference when the structure of the input diverges across time. Alternatively, our findings suggest an efficient processing strategy: infants used prior language experience to quickly

Summarizing an article

- What is the main theoretical question the authors are trying to answer?
- What were their predictions?
- What methodology did they use to test this?
- What were the main findings?
- What do those results mean, and how do they support or disprove the overarching theoretical question?
- Do you have any questions about the methods or conclusions? Can you find any holes in the authors' logic? Might there be a better way to test this idea? Do you buy their conclusions?

For next class:

- Do the reading (Kisilevsky, 2003)
  - Come to class with questions/comments about this paper
- Submit a multiple-choice mock exam question on Canvas
- Submit your Preliminary Questionnaire! Look out for my email!
  - Confidential! Only Casey 0 & I will see your response.
  - Completion will count toward participation this week
- Presenting your baby photos Look out for my email!

Tips for Surviving College (and Life)

- Build a social and professional network
  - Family, Friends, Professors, Graduate Students, Staff, etc.
- Stay active, get some rest, and take care of yourself
- Get out of your comfort zone once in a while
- Ask for help (preferably BEFORE you need it)
  - Princeton Counselling Services

PSY 254
Precept 1

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He/him/his