

# Artificial language learning workshop: Lecture 1

James Brand

j.brand@lancaster.ac.uk



# Outline

What you will learn in lectures 1 & 2:

- What Artificial Language Learning (ALL) is
- Why it is used in linguists research
- How it is used in linguistics research
- The validity of the paradigm

# Outline

What you will learn in lectures 1 & 2:

- Research that uses ALL to investigate grammar learning
- Research that uses ALL to investigate word learning
- Research that uses ALL to investigate reading
- Research that uses ALL to investigate language evolution

# Outline

What you will learn in lectures 3 & 4:

- What it is like to take part in an ALL experiment
- How to design ALL stimuli
- How to program an ALL experiment in PsychoPy
- How to interpret the data
- Ways to design your own ALL experiment

# What is artificial language learning?

Will I be learning about Valyrian, Dothraki,  
Klingon, Droidspeak etc.?

# What is artificial language learning?

## Valyrian languages

From Wikipedia, the free encyclopedia

The **Valyrian languages** are a fictional language family in the *A Song of Ice and Fire* series of fantasy novels by George R. R. Martin, and in their television adaptation *Game of Thrones*.

In the novels, High Valyrian and its descendant languages are often mentioned, but not developed beyond a few words. For the TV series, linguist David J. Peterson created the High Valyrian language, as well as the derivative languages Astaporí and Meereenese Valyrian, based on the fragments given in the novels.<sup>[1]</sup> Valyrian, alongside Dothraki, has been described as "the most convincing fictional tongues since Elvish".<sup>[2]</sup>

### Contents [hide]

1	High Valyrian
1.1	Creation
1.2	Phonology
1.3	Grammar
1.3.1	Nouns
1.3.2	Verbs
1.3.3	Adjectives
1.3.3.1	Class I adjectives
1.3.3.2	Class II and III adjectives
1.4	Duolingo course
2	Derivative languages
2.1	Astaporí Valyrian

Valyrian	
<b>Created by</b>	David J. Peterson, George R. R. Martin
<b>Date</b>	From 2012
<b>Setting and usage</b>	<i>A Song of Ice and Fire</i> novels (1996–) <i>Game of Thrones</i> TV series (2011–)
<b>Purpose</b>	Constructed languages <ul style="list-style-type: none"> <li>• Artistic languages</li> <li>• Fictional languages</li> <li>• Valyrian</li> </ul>
<b>Sources</b>	A priori language
Language codes	
<b>ISO 639-3</b>	<i>None</i> (mis)
<b>Glottolog</b>	<i>None</i>
<b>This article contains IPA phonetic symbols.</b> Without proper rendering support, you may see question marks, boxes, or other symbols instead of Unicode characters. For an introductory guide on IPA symbols, see <a href="#">Help:IPA</a> .	

# What is artificial language learning?

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# What is artificial language learning?

## Constructed language

From Wikipedia, the free encyclopedia

*This article is about the creation of planned or artificial human languages. For information about the linguistic field of language planning and policy, see [language planning](#). For languages that naturally emerge in computer simulations or controlled psychological experiments with humans, see [artificial language](#). For language with a high morpheme-per-word ratio, see [synthetic language](#).*

A **constructed language** (sometimes called a **conlang**) is a [language](#) whose [phonology](#), [grammar](#), and [vocabulary](#) are, instead of having developed [naturally](#), consciously devised for communication between intelligent beings, most commonly for use by humanoids. Constructed languages may also be referred to as [artificial](#), [planned](#) or [invented languages](#)<sup>[2]</sup> and in some cases [fictional languages](#). There are many possible reasons to create a constructed language, such as to ease human [communication](#) (see [international auxiliary language](#) and [code](#)), to give [fiction](#) or an associated constructed setting an added layer of realism, for experimentation in the fields of [linguistics](#), [cognitive science](#), and [machine learning](#), for [artistic creation](#), and for [language games](#).



# What is artificial language learning?

Will I be learning about Valyrian, Dothraki,  
Klingon, Droidspeak etc.?

NO

# What is artificial language learning?

Will I be learning how to test predictions  
about the way language is learnt using  
carefully designed experiments?

YES

# Why use artificial language learning?

*Copyright 2011 John Crowther*



*"Guess what, Charles, Quincy spoke his first words today, and the best part is I couldn't understand a thing he said. He's going to be bilingual."*

## Artificial Language Learning

# Why use artificial language learning?



# Why use artificial language learning?



# Why use artificial language learning?

ALL is best used in conjunction with other empirical methods

- Corpus analyses
- Computational modelling
  - Naturalistic recordings
- Neuropsychological measures
  - Individual differences

# What is artificial language learning?

The various forms of ALL...

# What is artificial language learning?

## LANGUAGE MONOGRAPHS

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EDITED BY

GEORGE MELVILLE BOLLING  
*Ohio State University*

AURELIO M. ESPINOSA  
*Stanford University*

EDWARD SAPIR  
*University of Chicago*

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NUMBER I

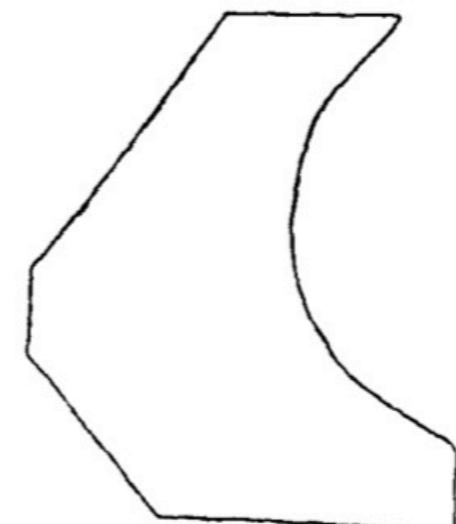
NOVEMBER, 1925

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**A TECHNIQUE FOR THE EXPERIMENTAL  
INVESTIGATION OF ASSOCIATIVE INTERFERENCE  
IN ARTIFICIAL LINGUISTIC MATERIAL**

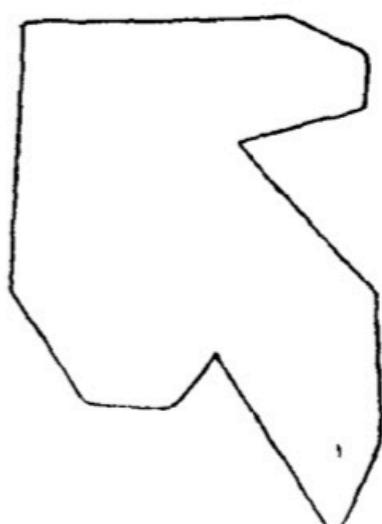
BY

ERWIN ALLEN ESPER  
*Assistant Professor of Psychology, University of Illinois.*



No. 1.

	I	II	III	I	II	III
R	nasliŋ	nulgen	čelhib	R	nasčaw	dolgən
G	wečliŋ	nugdet	vit	G	weččaw	dojgdet
B	/ownliŋ	nuzgub	zib	B	/ownčaw	dojzgub
Y	rojliŋ	numbow	tekbem	Y	*rojčaw	*dojmbow



No. 2.

Esper (1925)

# What is artificial language learning?

This is not an intelligence test. It is an experiment to determine how quickly you can learn the names of certain sacrificial objects in the Morgavian language, a language spoken on the northern slopes of the Himalaya Mountains. As each object is shown, I shall pronounce its name. You will immediately repeat the name after me aloud. If you are not sure of my pronunciation of any word, do not ask for a repetition, but do your best. Each time the series is repeated, try to make your pronunciation more like mine. Do not make any comments until the end of the hour, and do not set yourself any other task than looking at the objects and repeating their names after me.<sup>7</sup>

Esper (1925)

# What is artificial language learning?

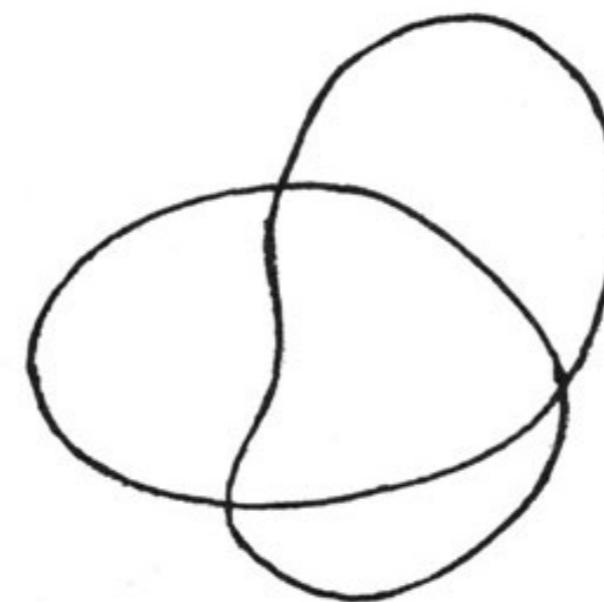


FIG. 18

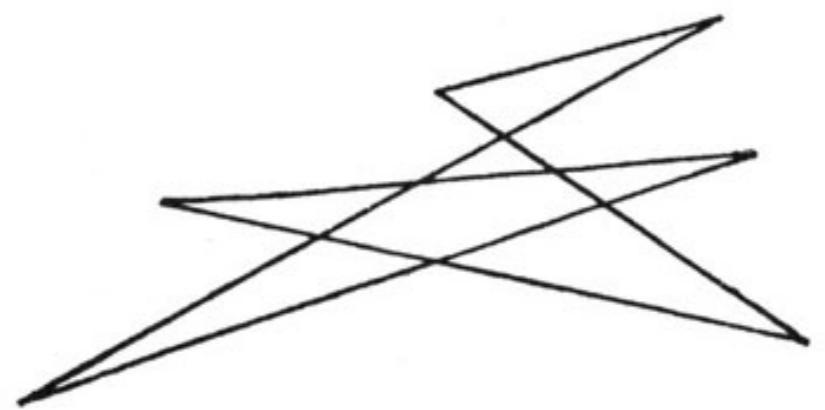
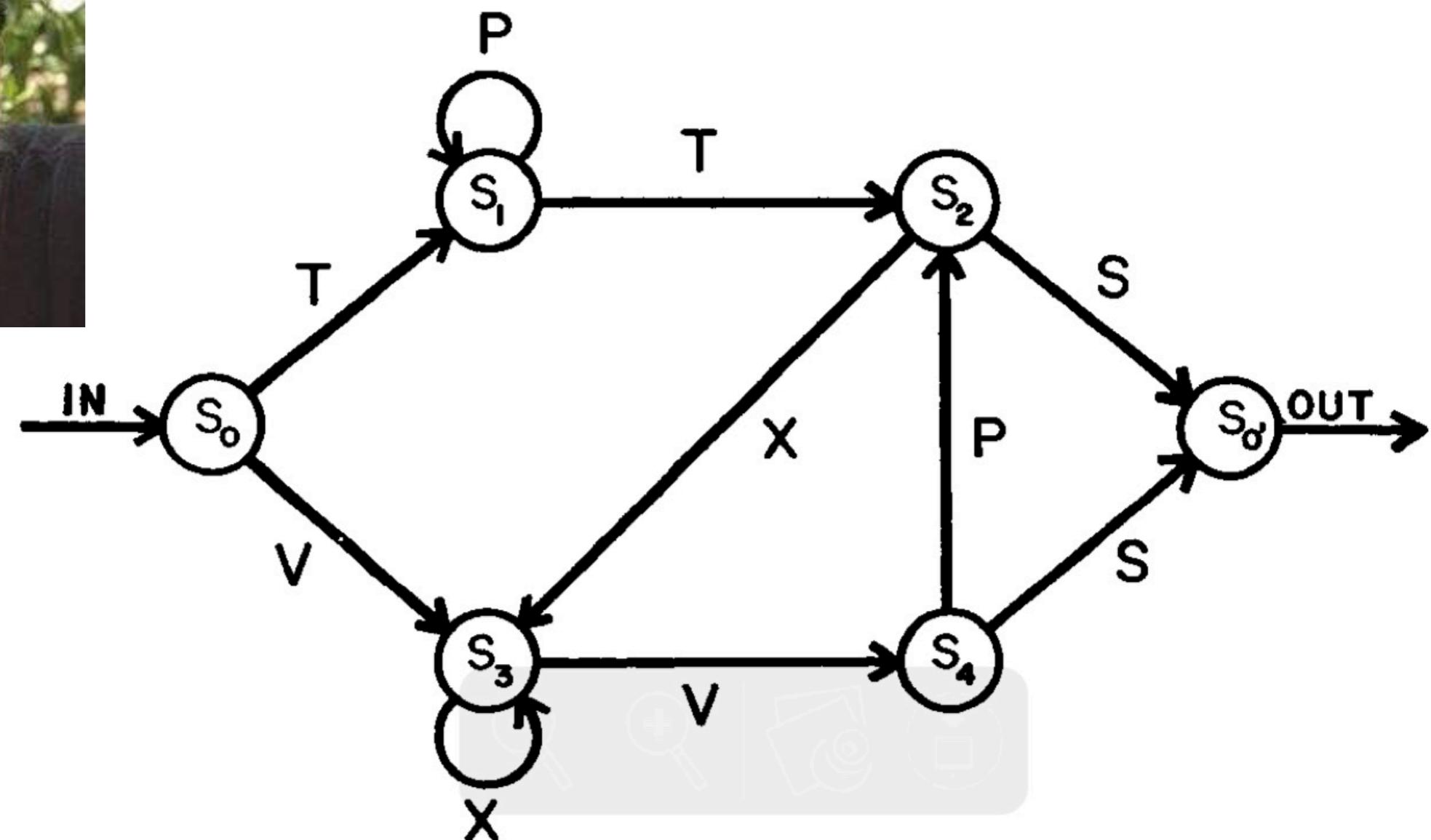
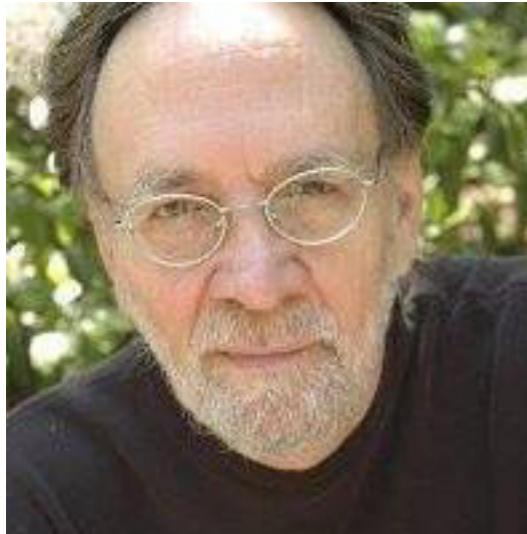


FIG. 19

Köhler (1929)

# What is artificial language learning?



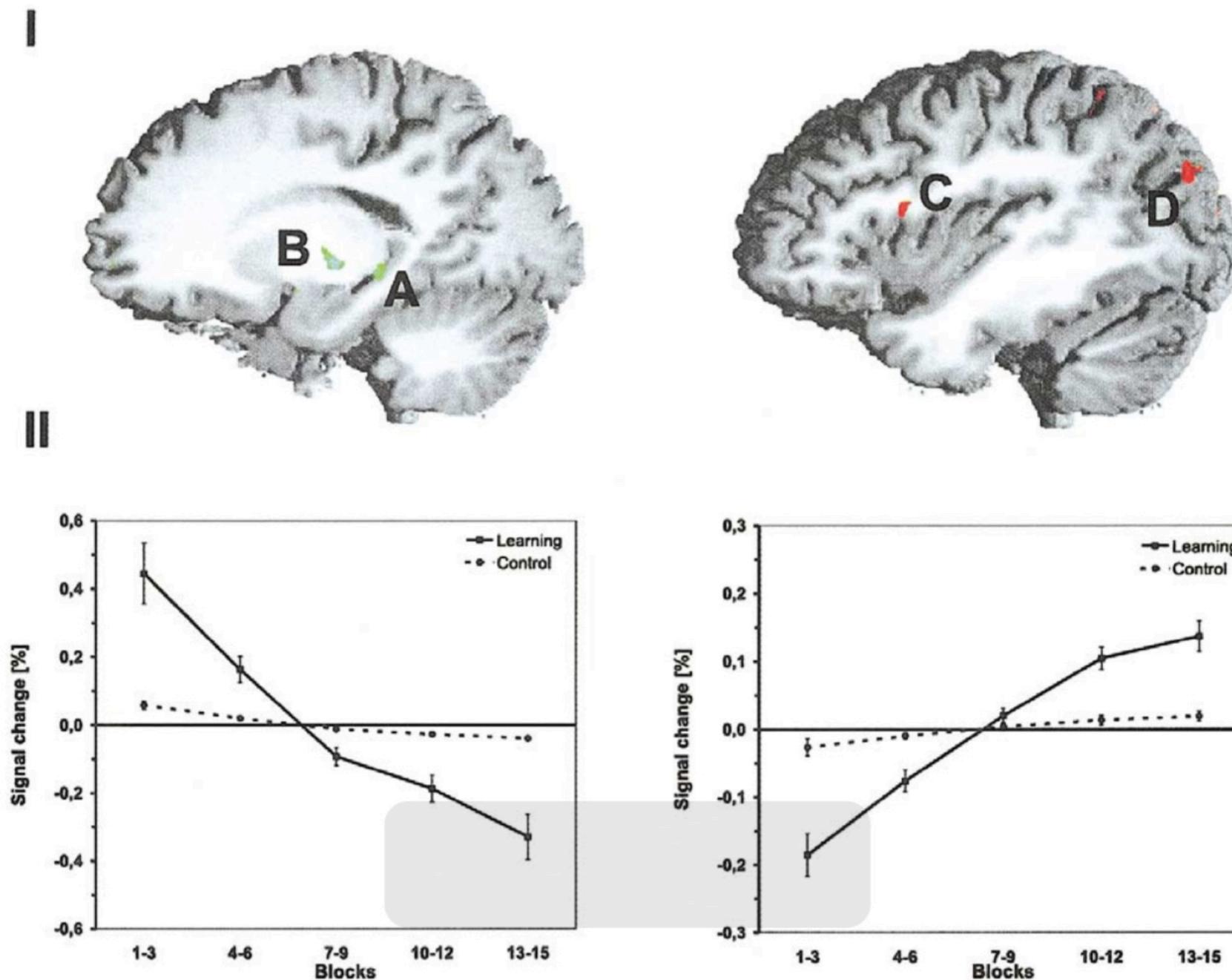
Reber (1967)

# What is artificial language learning?

		1R	1G	2R	2G	3R	3G	4R	4G
S		awa	vit	wuč	numbow	sotmiŋ	pel	ʃeb	faʒa
1			numbow		vit				
6				vuwč					
7					več	sotni			
10					vawč				
16			nimbow						
18				vowč		sotki			
19						ropki			
20									vafə
21			dinbow						
22			denbow						wafə
23				vowʃ	veʃ	repki			
24	əwa								wəʃə
25						retki			
29	ɔlba		vengow			kipki			
30			venɡow						
31	elba								
33			ven̩ga			pitka			
38				vowʒ	veʒ				
44	ɛlba		ven̩ga	vowʒ	veʒ	pitka	pel	ʃeb	wəʃə

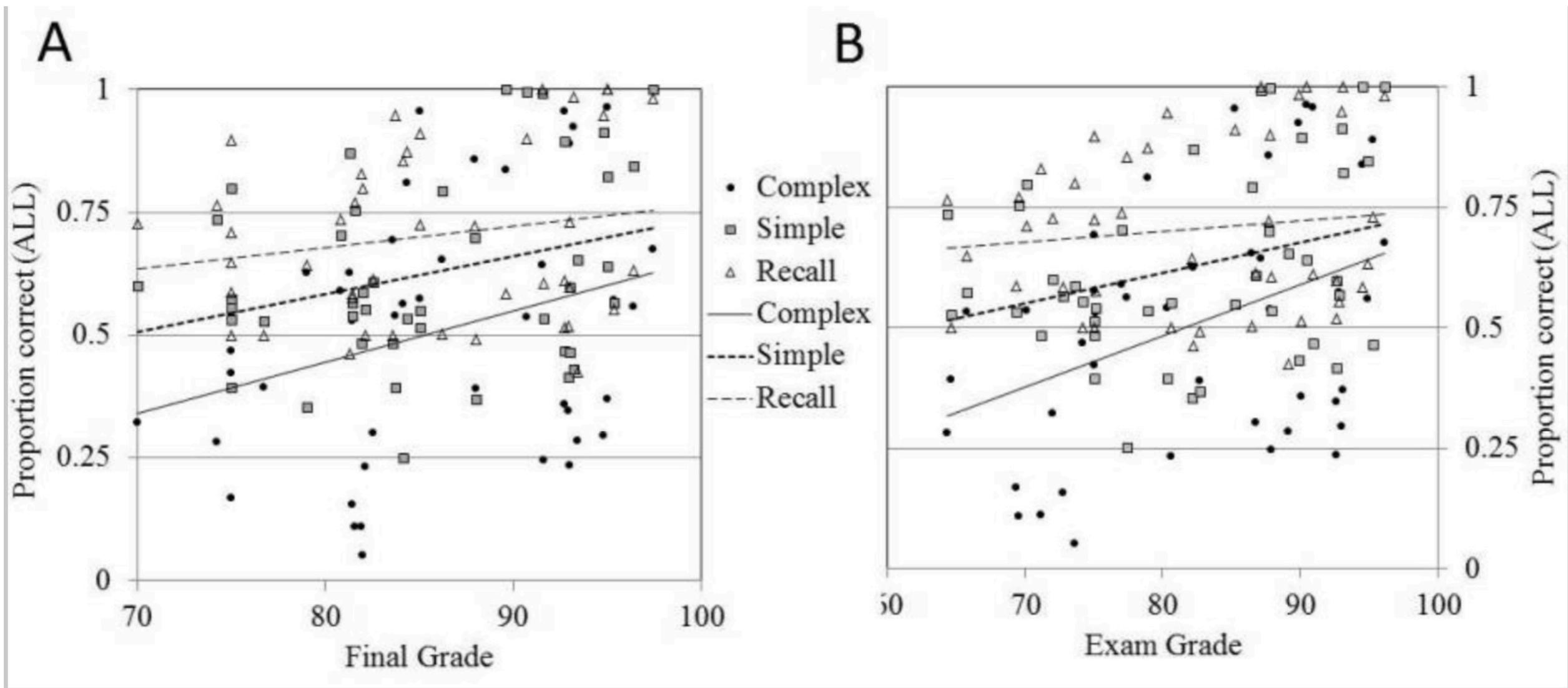
Esper (1966)

# How valid are artificial language learning experiments?



Opitz & Friederici (2003)

# How valid are artificial language learning experiments?



Ettlinger et al. (2016)

# Future directions of artificial language learning



jspsych



<https://mllewis.github.io/projects/RC/experiment38/refcomplex38.html>

# Future directions of artificial language learning



Chens Display

我的新谜局 ! ?

Select color represented by the symbols above.

Puzzle by Fonda Lynne ! ?

https://colorgame.net/en/

Important for lectures 3 & 4 (practical)

PsychoPy – to program and run an ALL experiment

<http://psychopy.org/installation.html>

Repository – to access lecture slides, experiment files, stimuli

[https://github.com/jamesbrandscience/SSoL\\_2018](https://github.com/jamesbrandscience/SSoL_2018)