# Ling 151/Psych 156A: Acquisition of Language II

## Lecture 1

## Introduction to language acquisition

# Administrivia

Instructor:

**Lisa Pearl**

Department of Linguistics

Department of Cognitive Sciences

lpearl@uci.edu

http://www.socsci.uci.edu/~lpearl

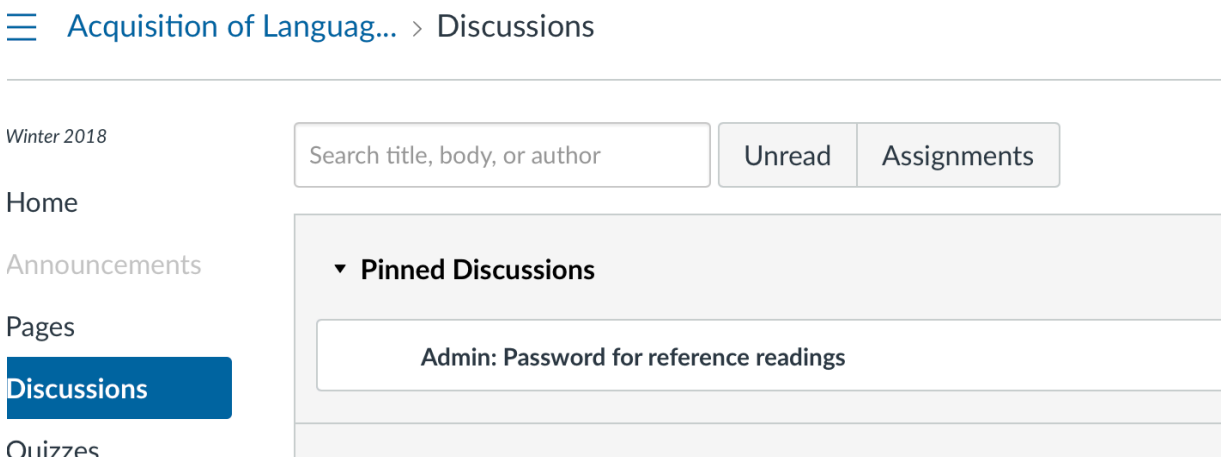
Office Hours: W, 3:00-4:00pm in SBSG 2314

# Administrivia

Message board (accessible via Canvas EEE)

https://canvas.eee.uci.edu/courses/7442/discussion_topics

Used to facilitate communication about the course administrivia and content. **Please go there first** to see if someone has already asked your question before emailing the prfoessor. It may be that your question is already answered there, and this will allow you to get a quicker response to your question.

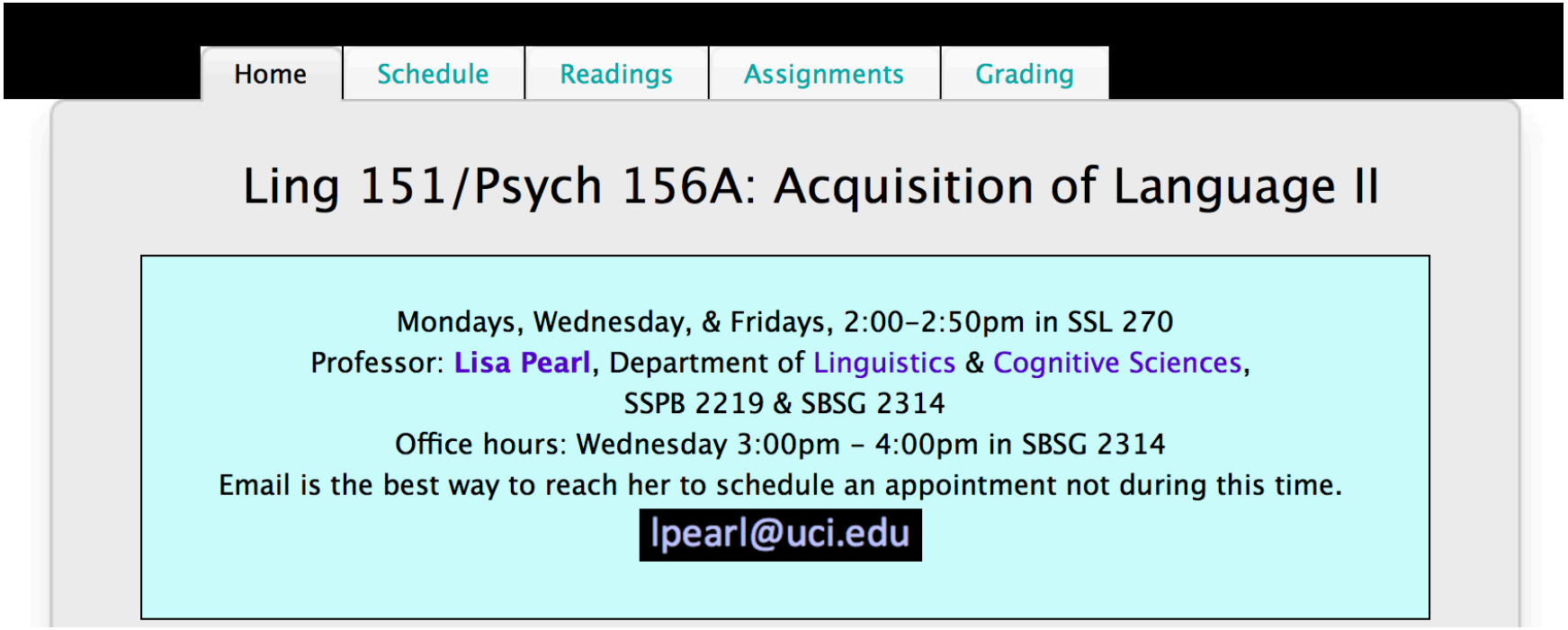


# Administrivia

Class web page:

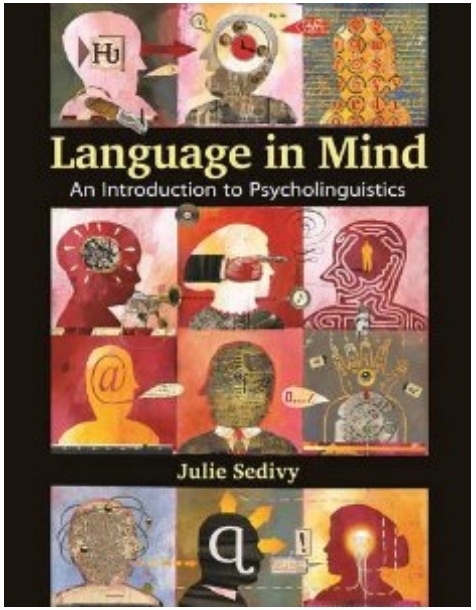
http://socsci.uci.edu/~lpearl/courses/acqoflang2_2018win/index.html

Contains overview, office hours, schedule, readings, assignment descriptions, and grading policies.



# Administrivia

Some reference readings will come from "Language in Mind" by Julie Sedivy




Others will be book excerpts, articles, and video links:

| | | | |
|---|---|---|---|
| 1/8/18 | **Intro 1** | Review questions available for intro<br><br>**HW1** available | • Video: The Linguistic Genius of Babies (up through 10:07 in particular)<br>• Jackendoff 1994: 3–34 [Chapters 1, 2, 3]<br>• O'Grady 2005: 164–175, "How do they do it?"<br>• Nativist perspective on language acquisition: (esp. 0:24–1:35) |

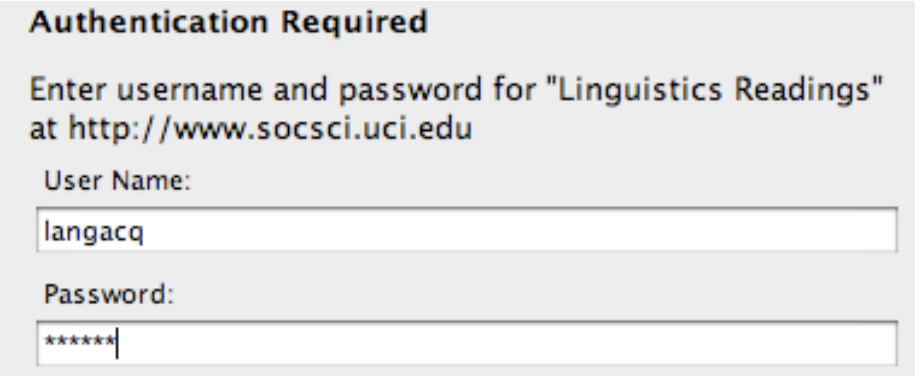
# Administrivia

Some readings & reference material will require a username and password to access.

User Name = langacq

Password = models

This information is also available on the message board under "Pinned discussions".




Lecture notes do not require a password

# Administrivia

## Assignments

Homework:

Late homework will be accepted according to the late policy listed in the assignments section on the class webpage. If you cannot turn in the homework on time, take advantage of the policy to get some credit for your assignment. Seriously.

**Late policy**: Late assignments will be accepted, but will lose 10% of the total score possible on the assignment for **every class session** late (*not* every day late). This is to encourage you to do the assignments, as it is far preferable to work through the material late rather than never. Moreover, homework comprises a hefty portion of your grade, so please do it – even if it's late. Late assignments can be submitted through the normal Canvas EEE interface.

**If you submit a late assignment, please email the instructor so that your assignment will be appropriately graded.**

# Administrivia

## Assignments

Homework:

Several throughout the quarter, available through EEE. Collaboration is allowed and **highly encouraged**. In fact, take a minute to introduce yourself to some people around you who might **form a homework/study group** with. However, you must turn in your own assignment copy.

Review questions are also available for each topic, but you are not required to do them. They are just there to help you review the material (and are a great way to study for exams).

# Administrivia

## Exams

Midterm exam:

There will be two online midterm exams on 2/2/18 and 2/28/18, available through EEE. They will cover the material in the prior weeks (not cumulative). Review questions will be available for each topic covered in class, and there will be a midterm review in class prior to each midterm exam on 1/31/18 and 2/26/18. Midterm exam questions will come from the homeworks and the review questions.

The midterm exams will be open-note, but **non-collaborative**.

If you are found collaborating with other classmates during a midterm exam, you will receive a 0.

For details of the online exam policy and procedure, see the course webpage. We will also go over these during the midterm review.

# Administrivia

## Exams

Final exam:

There will be an online final exam on 3/23/18, available through EEE. It will cover the material in weeks 1-10, with a strong focus on the material after the second exam. Review questions will be available for each topic covered in class, and there will be a final exam review in class on 3/16/18. Exam questions will come from the homeworks and the review questions.

The final exam will be open-note, but **non-collaborative**.

If you are found collaborating with other classmates during the final exam, you will receive a 0.

For details of the online exam policy and procedure, see the course webpage. We will also go over these during the final review.

# Administrivia

## Grades

Homework: 50%

Midterms: 20%

Final Exam: 30%

Your grades will be determined by *approximately* this scale (available on the webpage):

| | | | |
|---|---|---|---|
| 96-100: A+ | 84-88: B+ | 72-76: C+ | … |
| 92-96: A | 80-84: B | 68-72: C | |
| 88-92: A- | 76-80: B- | 64-68: C- | |

# Administrivia

## Extra Credit

You can earn up to 3 percentage points of extra credit two ways. (See the class web page under the "assignments" tab for more details.)

(1) Participate as a human subject in a language science experiment webgame (30 items = half a percentage point).

(2) Participate as a human subject in social science experiments for up to 3 hours (half an hour = half a percentage point).

### Extra credit

You may earn up to a maximum of 3 extra credit percentage points in one of two ways:

# Administrivia

## Schedule

"This is our wonderfully ambitious schedule. We'll attempt to keep with it, but it is subject to modification."

Topics:

| | | |
|---|---|---|
| Introduction | (1/8/18 – 1/12/18) | [3] |
| Sounds & Sounds of Words | (1/17/18 – 1/24/18) | [4] |
| Speech Segmentation | (1/26/18 – 1/29/18) | [2] |
| Word Meaning | (2/5/18 - 2/9/18) | [3] |
| Syntactic Categories | (2/12/18 – 2/14/18) | [2] |
| Sentences | (2/16/18 – 2/23/18) | [3] |
| Poverty of the Stimulus | (3/2/18 – 3/5/18) | [2] |
| Structure | (3/7/18 – 3/14/18) | [4] |

# What is language?

# What is language?


A language is a system of signals, such as voice sounds, gestures or written symbols, that encode or decode information.

Human languages are usually referred to as natural languages, and the science of studying them is linguistics.

The term "animal languages" is often used for non-human languages. Most researchers agree that these are not as complex or expressive as human language; they may better be described as animal communication. Some researchers argue that there are significant differences separating human language from the communication of other animals, and that the underlying principles are unrelated.

# Language is special

René Descartes

"It is a very remarkable fact that there are none … without even excepting idiots, that they cannot arrange different words together, forming of them a statement by which they make known their thoughts; while on the other hand, there is no other animal, however perfect and fortunately circumstanced it may be, which can do the same."

# Language is special

“For the moment, the main thing is to appreciate how hard a problem this is. The fact that we can talk (and cats can’t) seems so obvious that it hardly bears mention. But just because it’s obvious doesn’t mean it’s easy to explain. Think of another perfectly obvious, well-known phenomenon: the fact that metals turn red when you heat them. Why does this happen? It could be otherwise - they might just as well turn green or not change color at all. It’s a simple phenomenon, easily observable, but the explanation isn’t simple at all. It turns out to involve at the very least the theories of electromagnetic radiation and quantum mechanics, two of the more amazing intellectual advances in the past century. So it is, I want to suggest, with the human ability to use language.” - Ray Jackendoff, 1994

# Language is special

"What is so special about language? Maybe nothing if you are a snail or a camphor tree. But language is paramount among the capacities that characterize humans, setting us off from even the most perfectly formed and functioning of the other beasts on earth; so, as a matter of species pride – if nothing else – we would hold up language as a marker of our humanity and thus a focus of our scientific interest." (Gleitman & Liberman 1991: xix)

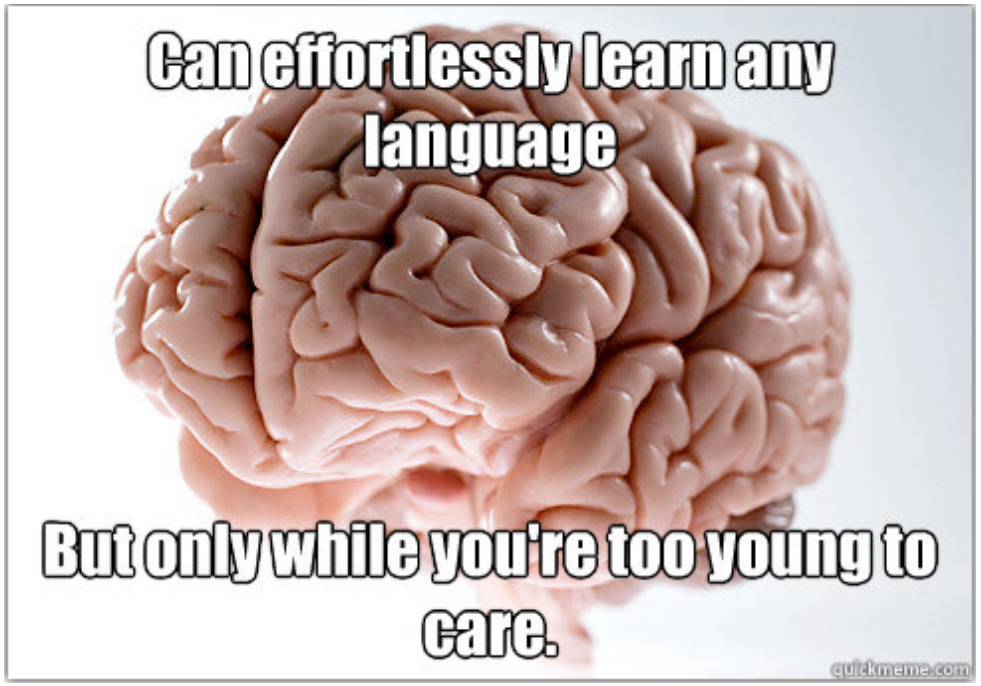
# Knowledge of language

It’s so natural for us to produce and comprehend language that we often don’t think about what an accomplishment this is.

Or how we learned language in the first place.

# The mystery of language acquisition

http://www.quickmeme.com/meme/36f39x/



# What's all the fuss about language development?

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Babies are amazing at learning language

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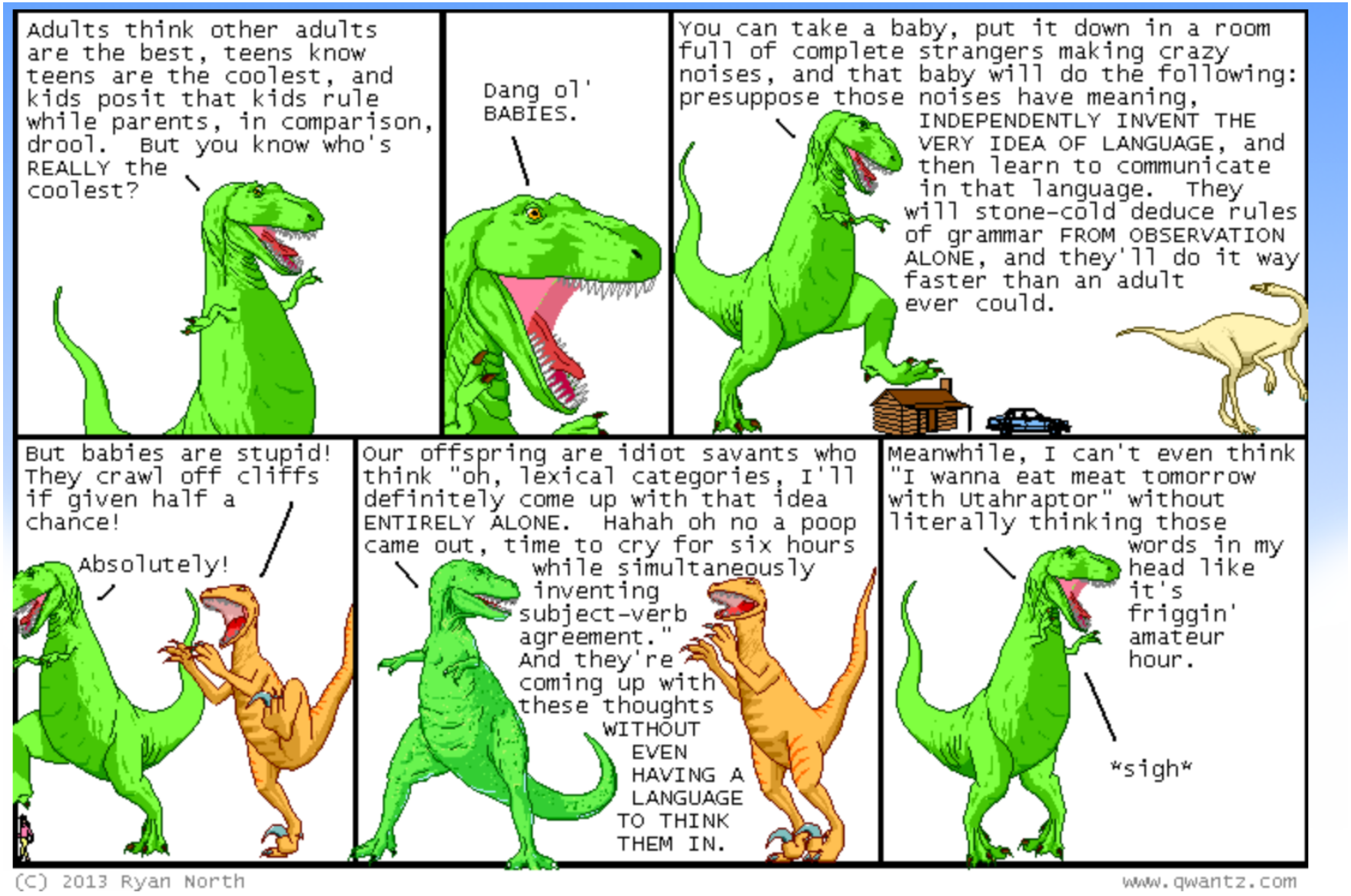



**http://www.qwantz.com/index.php?comic=2479**

# Babies are amazing at learning language

Wait…what exactly do you know when you know a language?

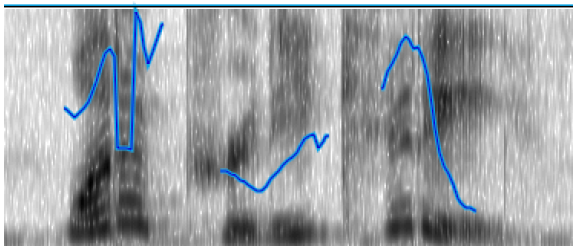
Wait…what exactly do you know when you know a language?

**A lot!**

# Wait…what exactly do you know when you know a language?

**A lot!**

You know how to identify words in fluent speech (speech segmentation)



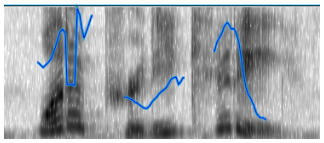
= wʌɾəpɹɪɾikɪɾi

wʌɾ ə pɹɪɾi kɪɾi

what a pretty kitty!

# Wait…what exactly do you know when you know a language?

**A lot!**



what a pretty kitty!

**speech segmentation**

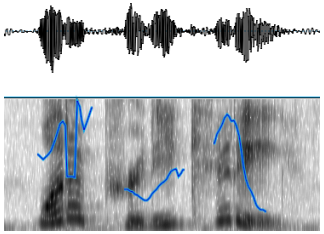
You know how to pronounce words (phonology)

✓ KI tty

✗ ki TTY

# Wait…what exactly do you know when you know a language?

**A lot!**



what a pretty kitty!

**speech segmentation**

✓ KI tty

✗ ki TTY

**phonology**

You know that certain words behave like other words (syntactic categorization)

**Noun**

what a pretty ___!

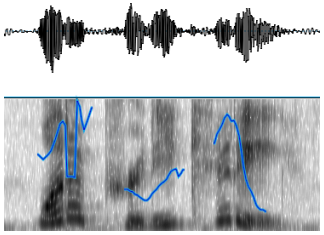
penguin

owl

kitty

# Wait…what exactly do you know when you know a language?

**A lot!**



what a pretty kitty!

**speech segmentation**

✓ KI tty

✗ ki TTY

**phonology**

**Noun**

penguin owl

kitty

**syntactic categorization**

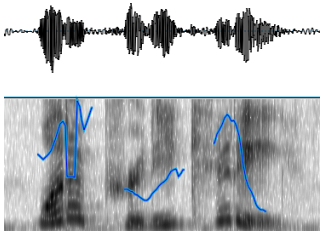
You know how to interpret words in context (syntax, semantics)

"Oh look — a pretty kitty!"

"Look — there's another one!"

# Wait…what exactly do you know when you know a language?

**A lot!**



what a pretty kitty!

**speech segmentation**

✓ KI tty

✗ ki TTY

**phonology**

**Noun**

penguin owl

kitty

**syntactic categorization**

"Oh look — a pretty kitty!"
"Look — there's another one!"

**syntax, semantics**

You know how to put words together to ask questions (syntax)

*This kitty was bought as a present for someone.*

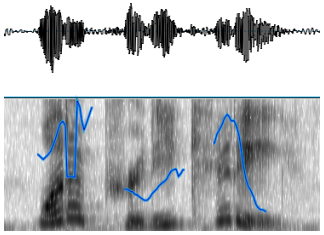
*Lily thinks this kitty is pretty.*

☹

*Who does Lily think the kitty for is pretty?*

# Wait…what exactly do you know when you know a language?

**A lot!**



what a pretty kitty!

**speech segmentation**

✓ KI tty

✗ ki TTY

**phonology**

**Noun**

penguin owl

kitty

**syntactic categorization**

*Who does Lily think the kitty for is pretty?* ☹

**syntax**

"Oh look — a pretty kitty!"
"Look — there's another one!"

**syntax, semantics**

You know how to identify the right interpretation in context (pragmatics)

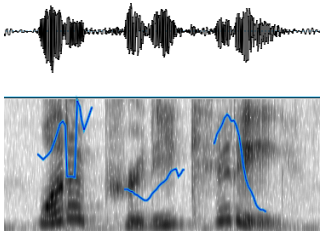
"Every kitty didn't sit on the stairs"

✗ No kitties sat on the stairs.

✓ Not all kitties sat on the stairs.

# Wait…what exactly do you know when you know a language?

**A lot!**



what a pretty kitty!

**speech segmentation**

✓ KI tty

✗ ki TTY

**phonology**

**Noun**

penguin owl

kitty

**syntactic categorization**

*Who does Lily think the kitty for is pretty?* ☹

**syntax**

"Oh look — a pretty kitty!"
"Look — there's another one!"

**syntax, semantics**

"Every kitty didn't sit on the stairs"

✓ Not all kitties sat on the stairs.

**pragmatics**

Wait…what exactly do you know when you know a language?

**A lot!**

phonology

speech segmentation

syntactic categorization

pragmatics

syntax

syntax, semantics

So how exactly do children learn all this?

# “The Linguistic Genius of Babies”


http://www.ted.com/talks/patricia_kuhl_the_linguistic_genius_of_babies.html

(up through 10:07, but especially through 7:55)

# Kids do amazing things

Much of the linguistic system is already known by age 3.

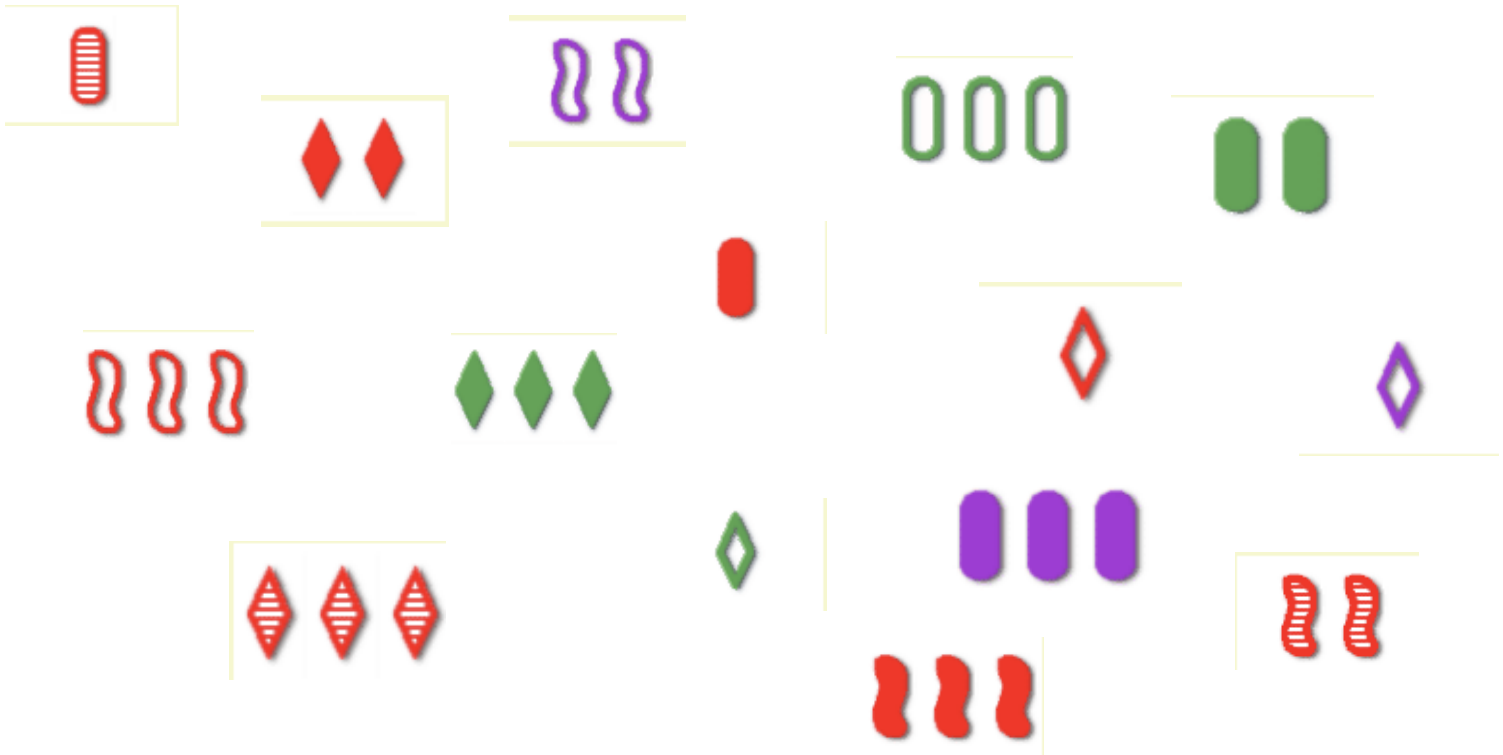
…when kids can't tie their own shoes
or reliably recognize "4".

What kids are doing: extracting patterns and making generalizations from the surrounding data mostly without explicit instruction.

Terminology: Patterns or "rules" of language = grammar

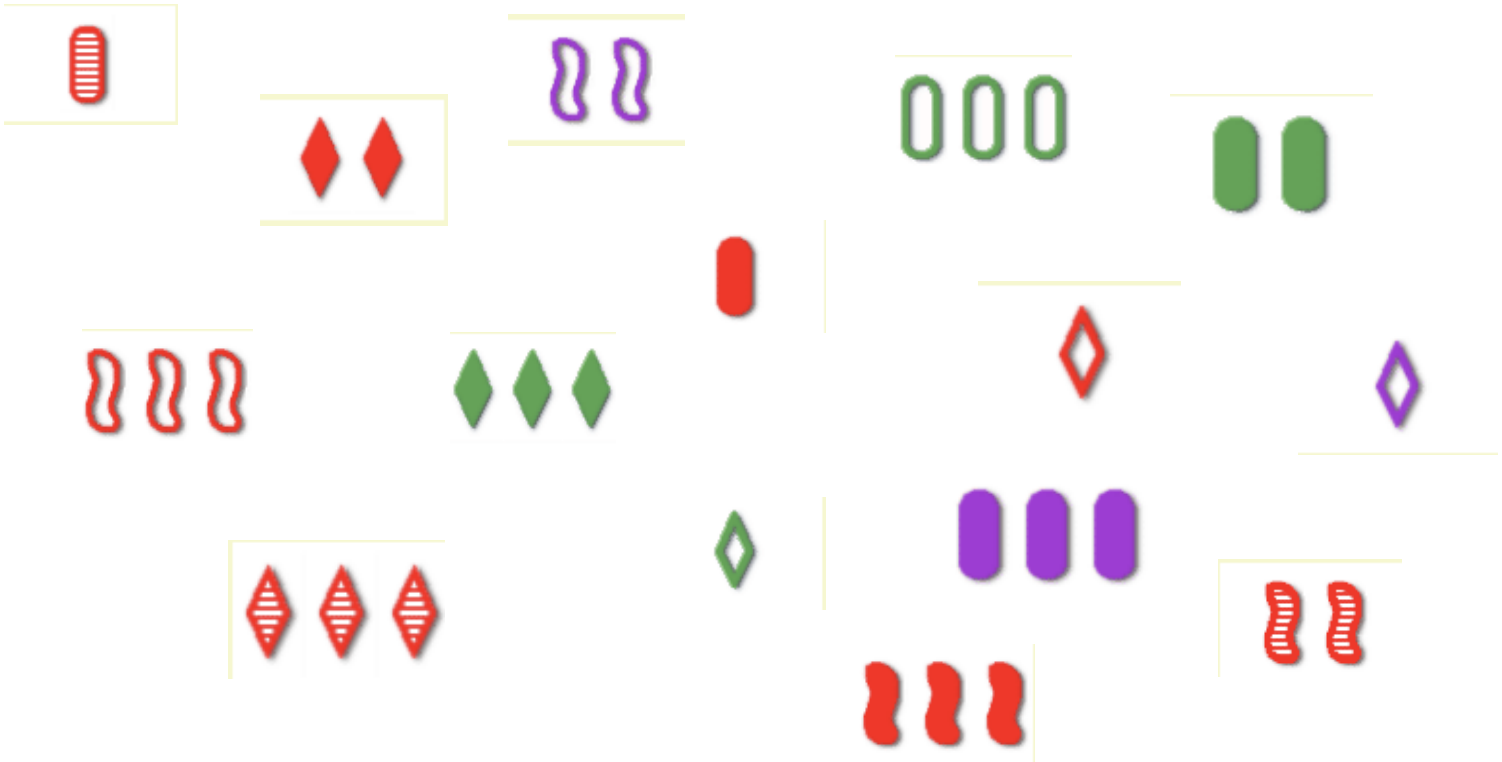
# A learning analogy: Set

Here are some cards - they have some salient features associated with them: **number** of items, **shape** of items, **color** of items, **fill** of items.



# A learning analogy: Set

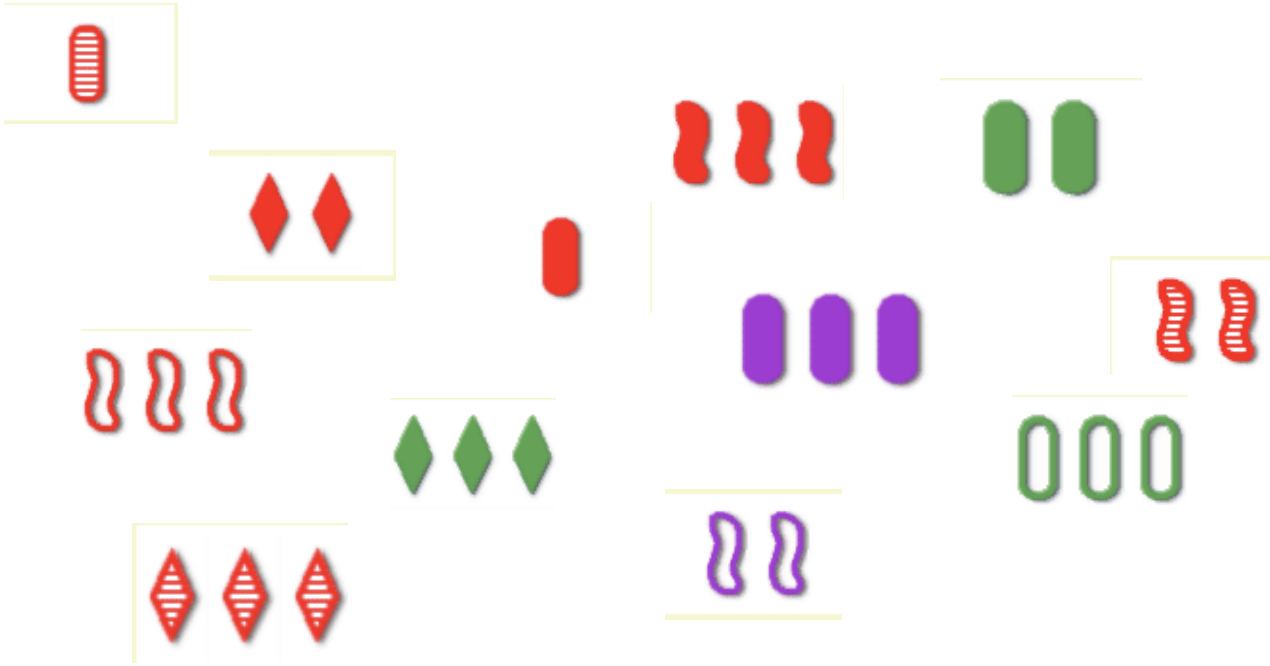
**Task: Find Sets.**



# A learning analogy: Set


**Here's one:**

**What generalizations might you make about Sets?**

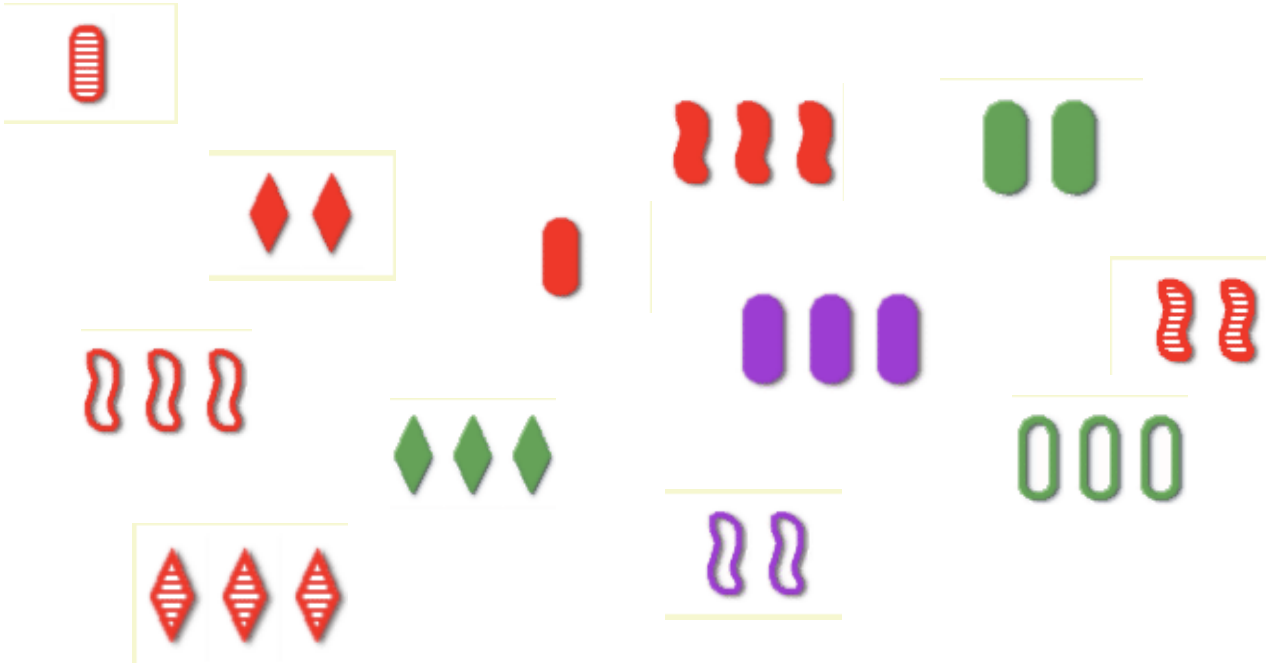


# A learning analogy: Set

**Here's one:**

**Set = all shapes, fills, and number of items the same?**

**What generalizations might you make about Sets?**

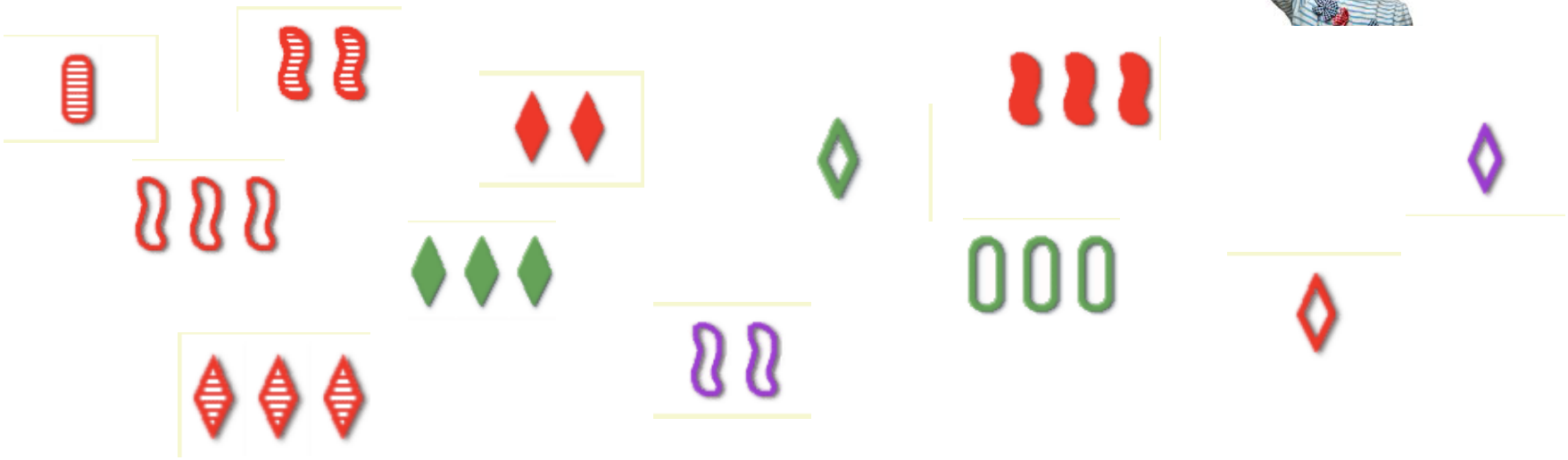



# A learning analogy: Set

**Here's another one:**

**Set = all shapes, fills, and number of items the same?**

**Does this fit the generalization?**

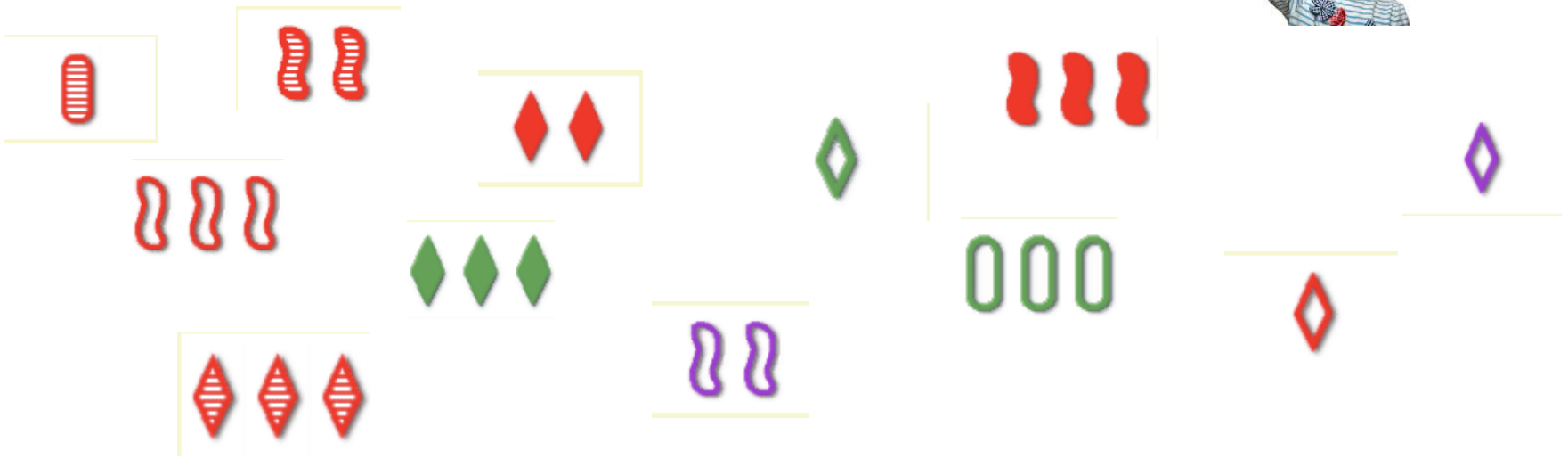



# A learning analogy: Set


**Here's another one:**

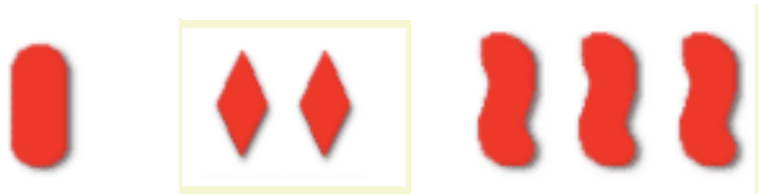
**Set = all shapes and fills the same?**

**Does this fit the generalization?**



# A learning analogy: Set

**Here's another one:**



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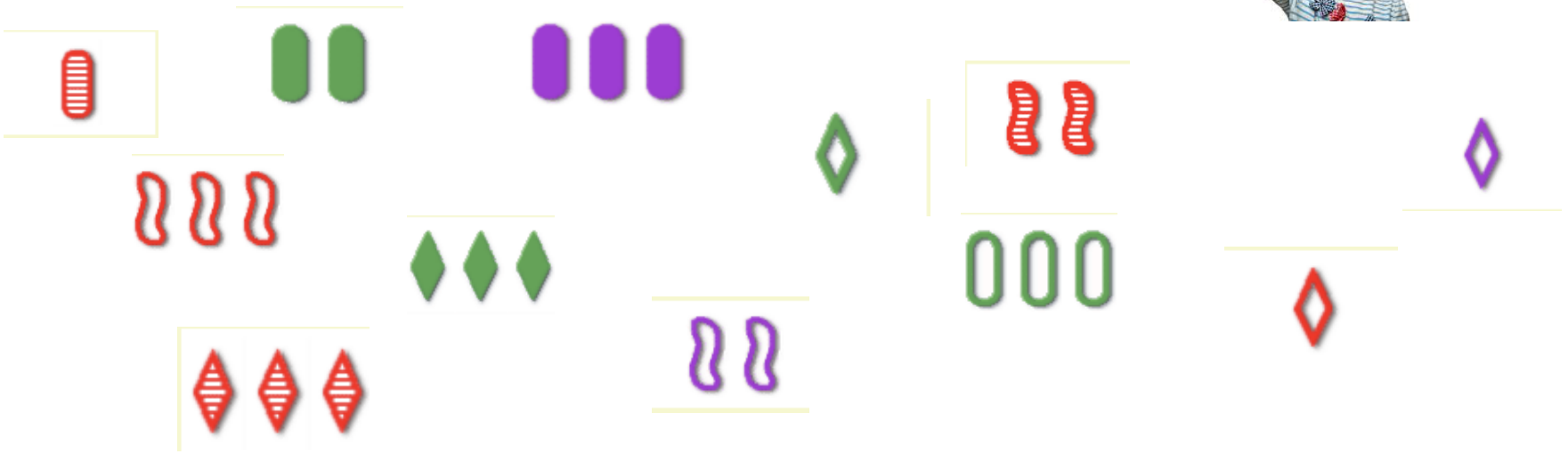
**Does this fit the generalization?**



# A learning analogy: Set

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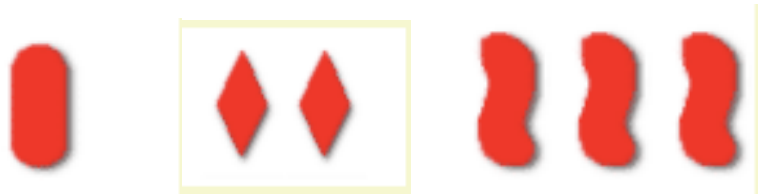

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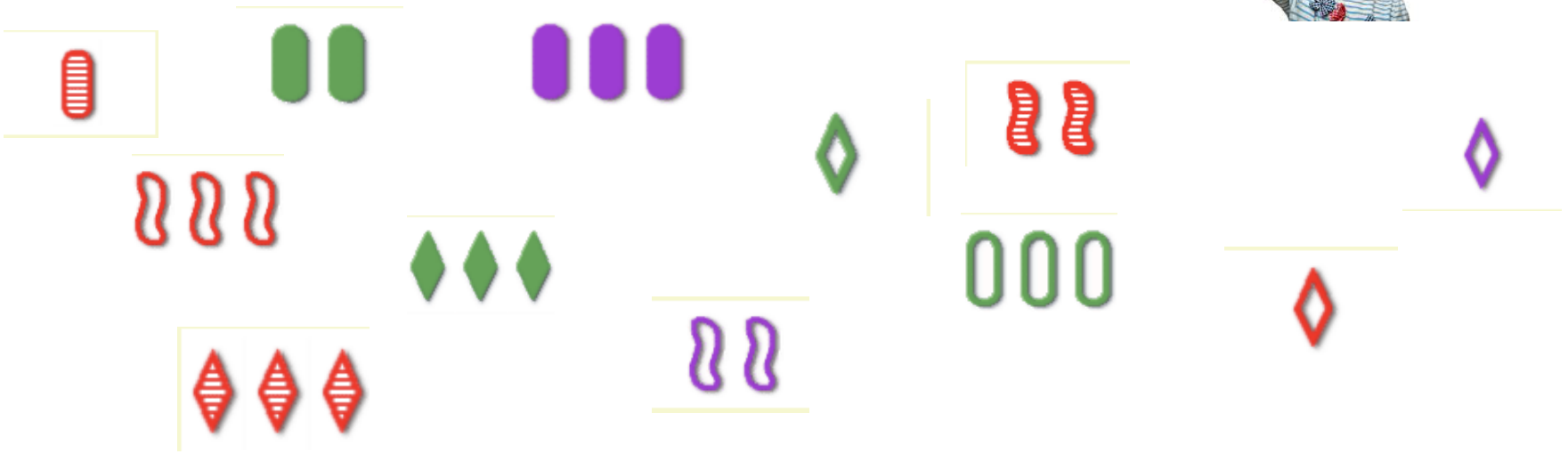
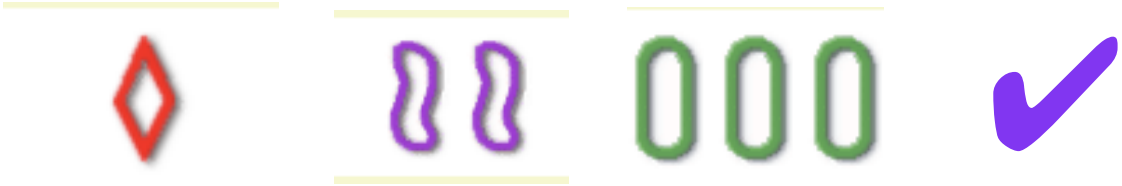


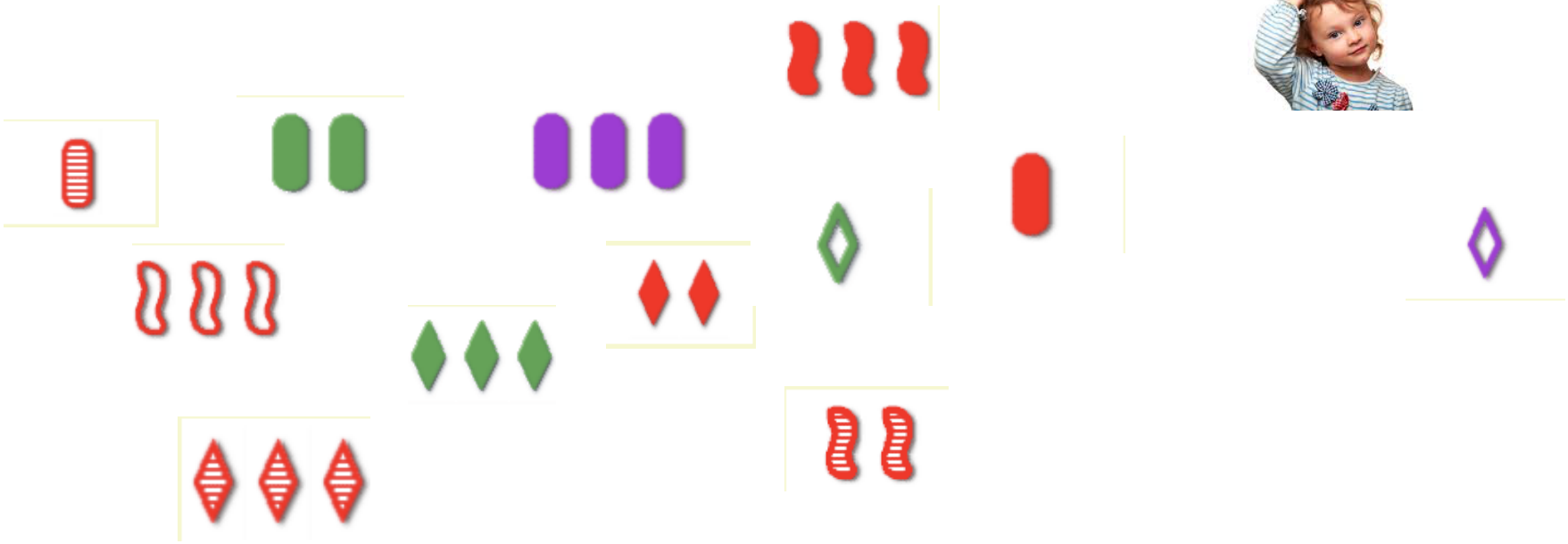
# A learning analogy: Set


**Is this a Set?**



**Set = all fills the same?**

**It truly is a set!**

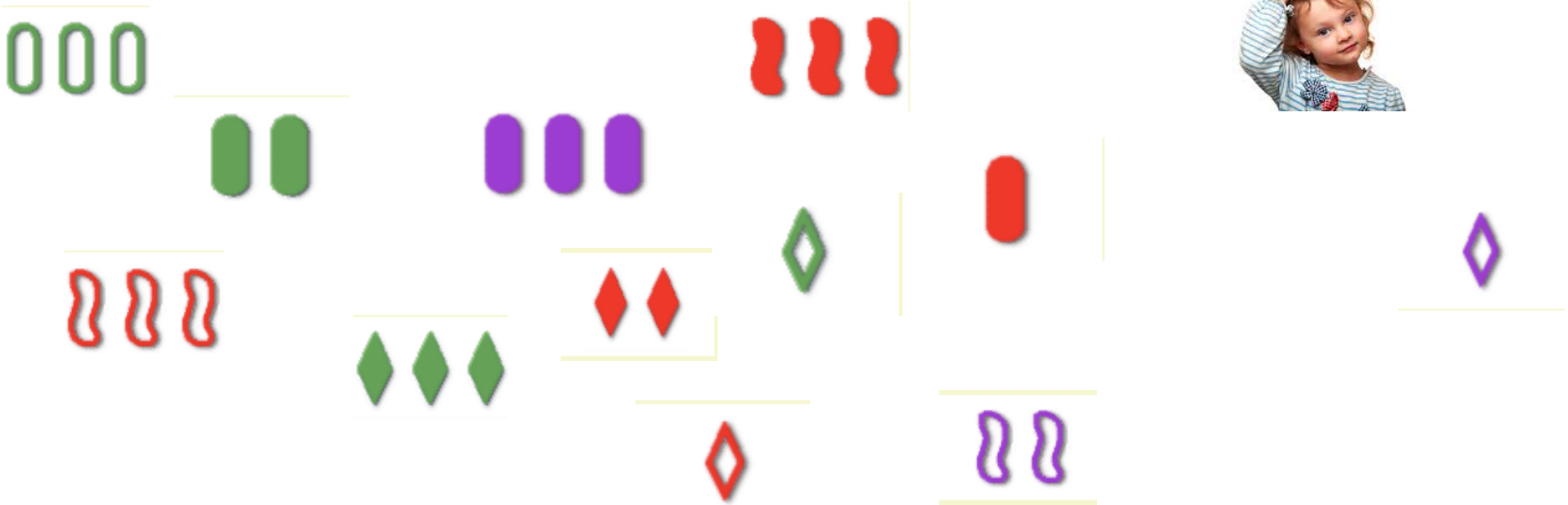


# A learning analogy: Set


**Is this a Set?**

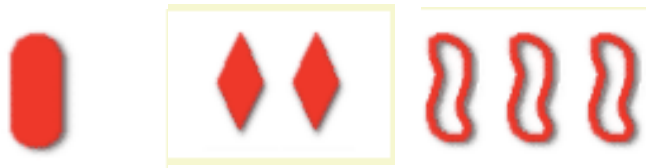
**Set = all fills the same?**

**It truly is a set!**



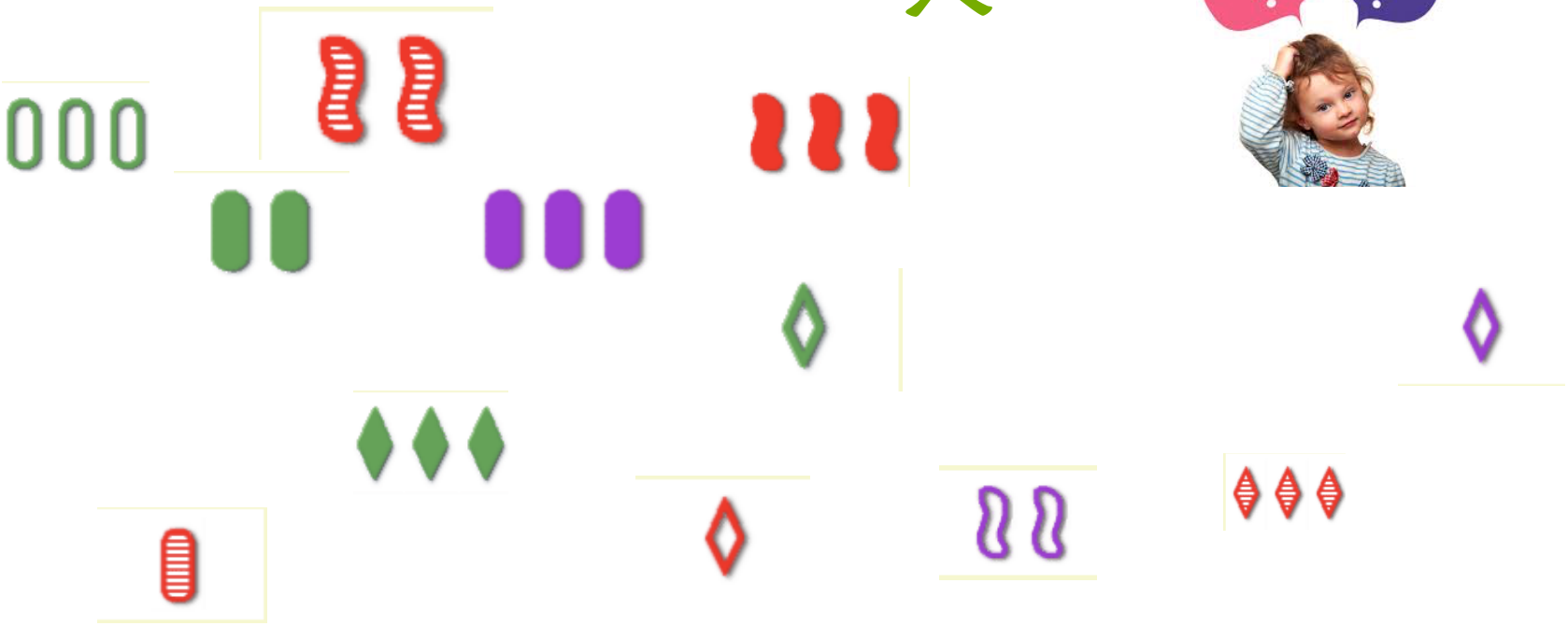
# A learning analogy: Set

**Is this a Set?**



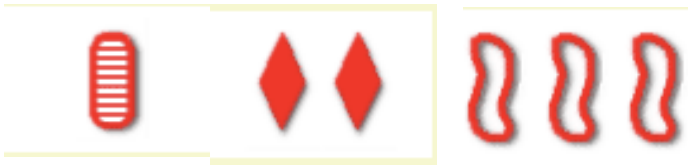
**Set = all fills the same?**

**It truly isn't a set!**

# A learning analogy: Set

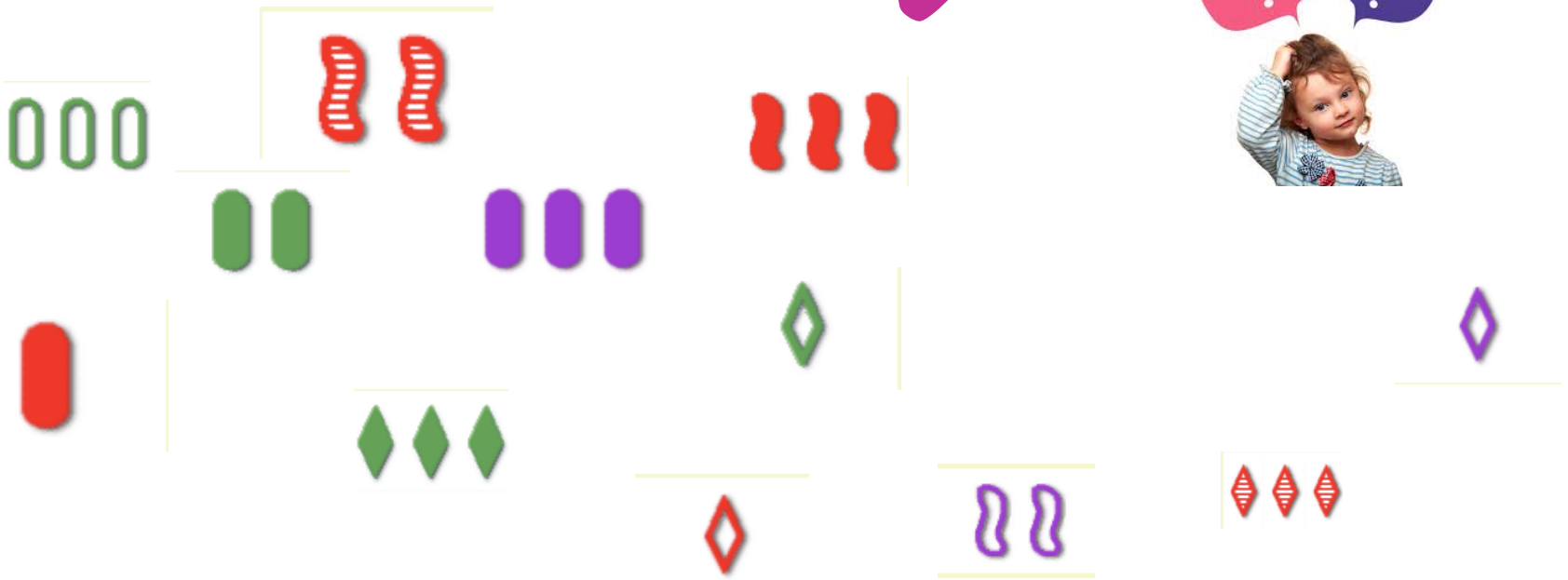
**Is this a Set?**



**Set = all fills the same?**

**Uh oh! Now what…**

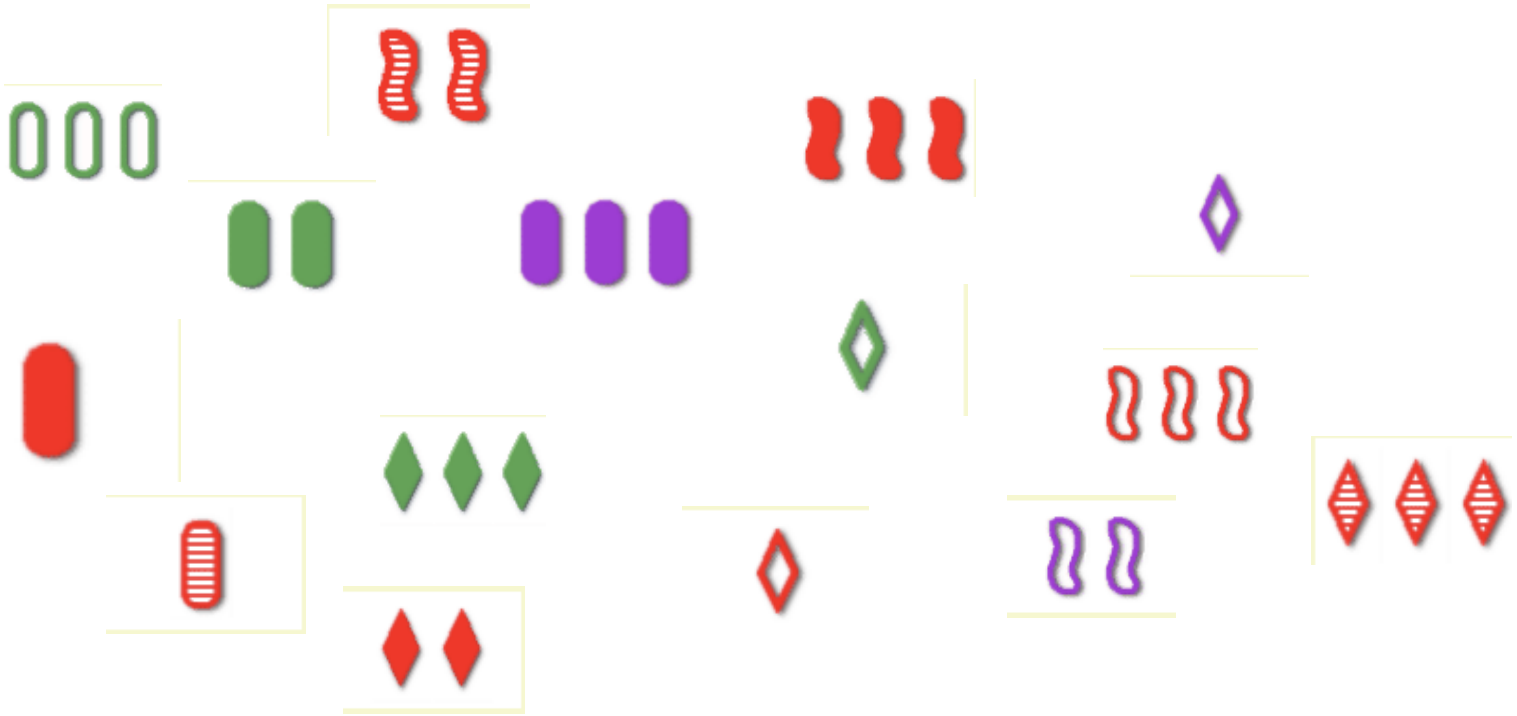
**It truly is a set!**



# A learning analogy: Set

**The grammar of Set**

**Set = three cards in which each individual feature is either all the SAME on each card or all DIFFERENT on each card.**



# A learning analogy: Set

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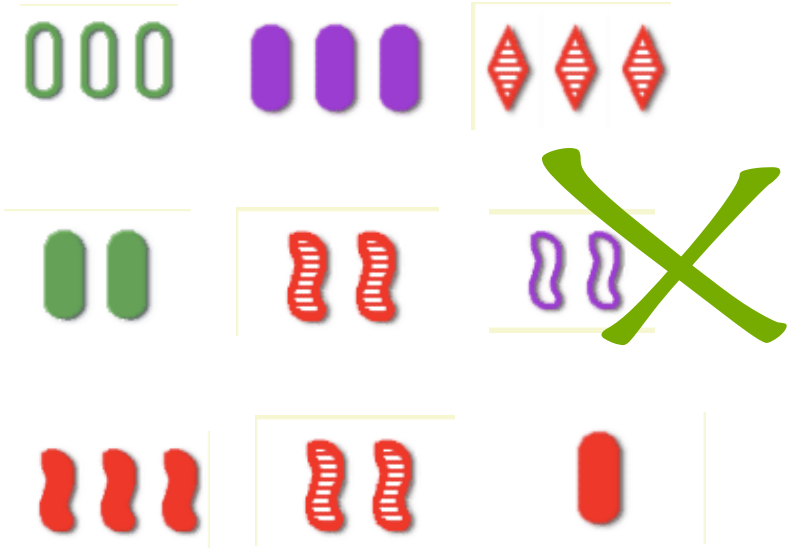
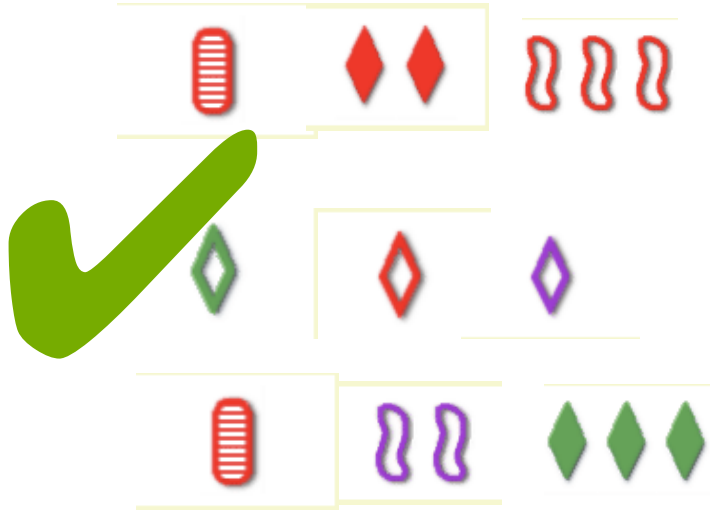
**Set = three cards in which each individual feature is either all the SAME on each card or all DIFFERENT on each card.**





# A learning analogy: Set


**The grammar of Set**

**Set = three cards in which each individual feature is either all the SAME on each card or all DIFFERENT on each card.**

Children infer language rules with this amount of complexity (and more!) from examples of language. And sometimes, even when there's noise (misleading examples in the input).

# A learning analogy: Set


**The grammar of Set**

**Set = three cards in which each individual feature is either all the SAME on each card or all DIFFERENT on each card.**

**noise** (misleading examples in the input)

**"This is a set"**

So how exactly do children learn all this?

**We know they do it relatively quickly.**

speech segmentation

phonology

syntactic categorization

syntax

syntax, semantics

pragmatics

Much of the linguistic system is already known by **age 4**.


Interesting: They do this mostly without explicit instruction.

# So how exactly do children learn all this?

**And when they do get explicit instruction, they don't really pay attention to things that don't impact meaning.**

*(From Martin Braine)*


**Child**: Want other one spoon, Daddy.
Father: You mean, you want the other spoon.
**Child**: Yes, I want other one spoon, please Daddy.
Father: Can you say "the other spoon"?
**Child**: Other…one…spoon.
Father: Say "other".
**Child**: Other.
Father: "Spoon."
**Child**: Spoon.
Father: "Other spoon."
**Child**: Other…spoon. **Now give me other one spoon**?

# So how exactly do children learn all this?

**In general, imitation isn't likely to get them too far.…**

Imitation certainly *is* useful for learning some aspects of language, such as learning that the sequence of sounds "*cat*" refers to a furry, purring pet.


# So how exactly do children learn all this?

**In general, imitation isn't likely to get them too far.…**

However, children can't learn how to understand and produce full sentences by imitating what they hear and repeating it word for word.


Why not?

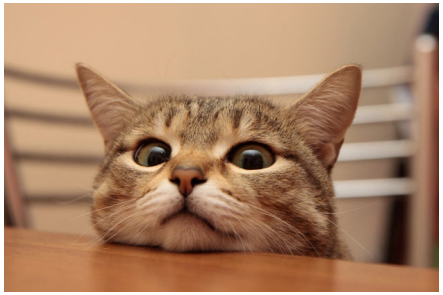
One reason: Most sentences are novel – you understand and produce them on the fly, and may never have heard them before.

# So how exactly do children learn all this?

**In general, imitation isn't likely to get them too far….**

Also, it turns out that children are bad at imitating sentences where they don't know some of the words (so how could they learn those words by imitating them?):


"The cat is hungry" becomes "Cat hungry."



# So how exactly do children learn all this?

**In general, imitation isn't likely to get them too far.…**

In addition, children don't often repeat word-for-word what adults around them say.

# What kids are doing

**Extracting patterns** and **making generalizations** from the surrounding data mostly just by hearing examples of what's allowed in the language.


Remember: Patterns or "rules" of language = grammar

# The rules of language = grammar

It's also unlikely children learn by being explicitly taught all the rules of their language. This is because once we go beyond the most superficial things (like "cat" is a furry, purring pet), most of our knowledge is subconscious.


We know it – but we don't know *how* we know it or why it's so.

# Knowledge of language & hidden rules

Some examples from language:

You know that…

…*strimp* is a possible word of English, while *stvimp* isn't.

# Knowledge of language & hidden rules

Some examples from language:

You know that…

…to ask about "someone" in the sentence
"You think that [someone] did it",
you can't ask it this way:

"Who do you think that did it?" 

(Instead: "Who do you think did it?") 

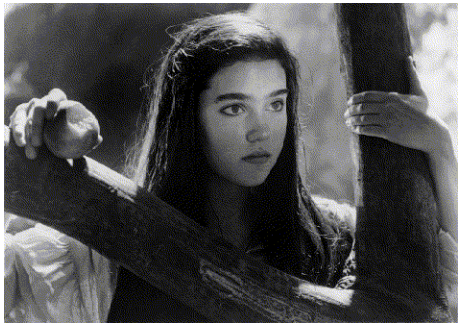
# Knowledge of language & hidden rules

Some examples from language:

You know that…

*she* can be *Sarah* in all of these:

Sarah ate the peach while she was reading.
While she was reading, Sarah ate the peach.
While Sarah was reading, she ate the peach.



but in "She ate the peach while Sarah was reading", *she ≠Sarah*

# Knowledge of language & hidden rules

Some examples from language:

You know that…

…the ‘s’ in ‘cats’ sounds different from the ‘s’ in goblins

cats: ‘s’ = /s/

goblins: ‘s’ = /z/

# Knowledge of language & hidden rules

Some examples from language:

You know that…

… contracted forms like “wanna” and “gonna” can’t always replace their respective full forms “want to” and “going to”.

*You get to choose who you will rescue.*

“Who do you want to rescue?”

“Who do you wanna rescue?”

# Knowledge of language & hidden rules

Some examples from language:

You know that…

… contracted forms like “wanna” and “gonna” can’t always replace their respective full forms “want to” and “going to”.

*You get to choose who you will rescue.*

“Who do you want to rescue?”

“Who do you wanna rescue?”

*You get to choose who will do the rescuing.*

“Who do you want to do the rescuing?”

* “Who do you wanna do the rescuing?”

# Knowledge of language & hidden rules

Some examples from language:

You know that…

… contracted forms like “wanna” and “gonna” can’t always replace their respective full forms “want to” and “going to”.

*You get to choose who you will rescue.*

“Who are you going to rescue?”

“Who are you gonna rescue?”

# Knowledge of language & hidden rules

Some examples from language:

You know that…

… contracted forms like “wanna” and “gonna” can’t always replace their respective full forms “want to” and “going to”.

*You get to choose who you will rescue.*

“Who are you going to rescue?”

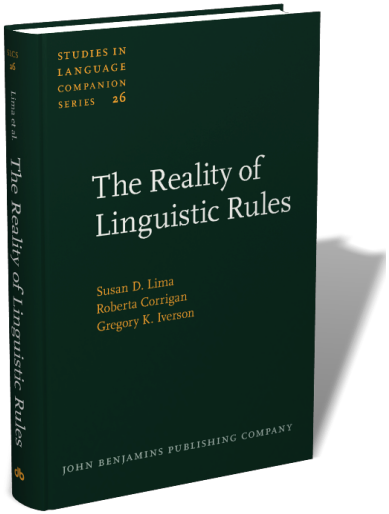
“Who are you gonna rescue?”

“I’m going to the witch’s lair to rescue her.”

* “I’m gonna the witch’s lair to rescue her.”

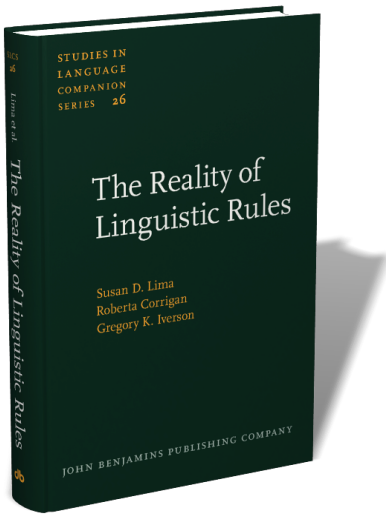
# Linguistic rules

The point: our minds store words and meanings and the patterns into which they can be placed (= **rules**).




# Recap

Children learn rules about language that are quite complex. How they typically do this so well and so quickly is a major mystery.


Children don't just imitate what they've heard - they're trying to figure out the patterns of their native language. Also, they may not notice or respond to explicit correction.

# Questions?

You should be able to do
up through question 5 on the introduction review questions and
up through question 1 on HW1.