


### Words

PSY 200  
Greg Francis  
Lecture 27


*What is the plural of walkman?*

Purdue University 

1

### Grammar


- The rules of phrases
  - ♦ rules for combining phrases
  - ♦ universals for all languages
- So why do we have so difficult a time communicating with people that speak other languages?

Purdue University 

2

### Words

- Even if all languages have similar rules for combining phrases, they use different *words*
- Words are **symbols** that are arbitrary in many respects
  - ♦ “dog” is nothing like a dog
  - ♦ is it rote memorization?
    - » partly, but it is also more than that


Purdue University 

3

### Words are special

- Words are not just a collection of letters
  - ♦ Word superiority effect
  - ♦ Judge a pair as being the same or different

HRNO	LITL	TRIP	DEAL
CRNO	LITL	TRAP	DEAL


Purdue University 

4

### Words are special

- The judgment does not require you to *read* the words
  - ♦ Visual inspection is sufficient
- Knowing an item is a word should not even help you do the task

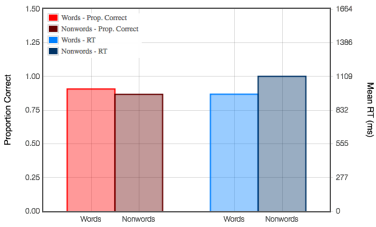
HRNO	LITL	TRIP	DEAL
CRNO	LITL	TRAP	DEAL

Purdue University 


5

### Words are special

- But words are judged faster (around 147 ms) and more accurately than nonwords
- CogLab data (163 participants)



Category	Measure	Words	Nonwords
Accuracy (Prop. Correct)	Words - Prop. Correct	~0.90	~0.85
	Nonwords - Prop. Correct	~0.85	~0.80
Reaction Time (Mean RT in ms)	Words - RT	~850	~1100
	Nonwords - RT	~1100	~1350

Purdue University 

6

### Word rules

- Part of linguistics identifies the rules for working with words (morphology)
  - Show this page to a preschooler
- The child will say *wugs* even though he has never seen a *wug* before
  - This implies that there must be a **rule** for pluralizing nouns

Purdue University

7

### Morphology

- The rules of word formation
- In many respects English has a very limited morphology
  - nouns have two forms
  - verbs have four forms

duck  
ducks

quack  
quacks  
quacked  
quacking

Purdue University

8

### Morphology

- Other languages have many more variations
  - Italian and Spanish have 50 forms of *each* verb
  - classical Greek has 350 forms of *each* verb
  - Turkish has 2 million forms of *each* verb
  - some languages build entire sentences around one complex verb
- There are rules for these forms

Purdue University

9

### Morphology

- English can convey this information in as many ways as other languages, but we use grammatical phrases to do so
- Simple present tense
  - General truths: *Ducks quack.*
  - Habitual action: *I quack like a duck when I wake up.*
- Present Perfect Progressive
  - To express duration of an action that began in the past, has continued into the present, and may continue into the future: *The duck has been quacking for two hours, and he hasn't finished yet.*
- Other languages have different verb forms to indicate these conditions

Purdue University

10

### Morphology

- On the other hand, English morphology allows one to easily create new words from old words
  - add suffixes and prefixes

Purdue University

11

### Suffixes

- English has lots of these derivational suffixes

-able	-ify	-ance	-ism	-ous	Examples of morphemes
-age	-ion	-ary	-ist	-y	
-al	-ish	-er	-ity		
-ate	-ize	-ful	-ive		
-ed	-an	-hood	-ness		
-en	-ant	-ic	-ory		

You probably do not consciously know what some of these mean, but your language system does.

Purdue University

12

### Compounding


- English also allows new words to be created out of other words
  - and combinations can be combined

tooth      brush

↓      ↓

toothbrush

unmicrowaveability



bootylicious

Purdue University

13

### Rules

- So what are the rules?
- One looks to be easy
  - to pluralize a noun, add -s

N

↓      ↓

Nstem    Ninflexion

dog      -s

N

↓      ↓

Nstem    Ninflexion

wug      -s

Purdue University

14

### Rules

- The creation of compound nouns also follows a simple rule

Nstem

↓      ↓

Nstem    Nstem

tooth    brush

Nstem

↓      ↓

Nstem    Nstem

dog      bite

By the way, ignore what grammar school might have taught you, these are *not* adjective-noun phrases

Purdue University

15

### More detail on rules

- Consider a rule that creates an adjective out of a verb
- Or a noun out of a verb

Astem

↓      ↓

Vstem    Astemaffix

crunch    -able

Nstem

↓      ↓

Vstem    Nstemaffix

crunch    -er

Purdue University

16

### Root

- Some morphemes can only be attached to certain types of words
  - a root is a word that cannot be split into smaller parts
  - some morphemes attach *only* to roots
  - thus, *Darwinianisms* is a word, but *Darwinismians* is not
    - ian must attach to a root

N

↓      ↓

Nstem    Ninflexion

↓      ↓

Nstem    Nstemaffix

↓      ↓

Nroot    Nrootaffix

Darwin    -ian

Purdue University

17

### Lexicon

- To keep track of what can attach to what, there must be a mental dictionary of morphemes
  - able
    - » adjective stem affix; means “capable of being X’ d”; attach me to a verb stem
  - er
    - » noun stem affix; means “one who X’ s”; attach me to a verb stem
  - ...

Purdue University

18

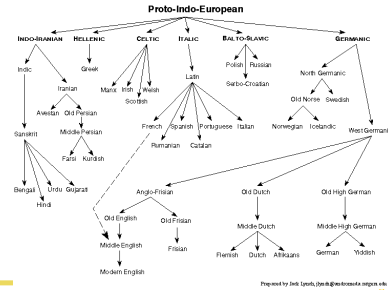
### Exceptions

- You can probably think of lots of exceptions to these types of rules
  - many words seem to follow arbitrary rules
- Pluralization, past tense
  - » mouse, mice            teach, taught
  - » leaf, leaves            buy, bought
  - » man, men                fly, flew
- The exceptions are related to relationships between different languages

19

### Language families

- Many languages are related to each other and have broad families
  - Which is why you see so many similar words across languages



20

### Exceptions

- The exceptions generally come from other languages (with appropriate rules)
  - English adopts the words but not the rules
- These exceptions tend to be very common words
  - » drink-drank            sink-sank
  - » throw-threw            ring-rang
  - » sit-sat                 blow-blew
- All derive from a proto-Indo-European language that formed past tense by replacing one vowel with another

21

### Very special cases

- What is the plural of *walkman*?
  - walkmans?
  - walkmen?
  - Neither feels quite right
- To answer this question we have to understand how the word *walkman* is formed and what it is about
  - this tells us how to pluralize the word



22

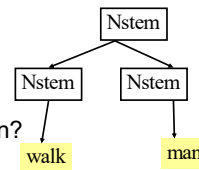
### Heads

- Most words have a *head* that indicates what the word is "about"
- In English it is always the *rightmost* morpheme
  - » *crunchable*            a thing that can be "x"-ed
  - » *cruncher*                a thing that does "x"
  - » *workman*                a type of person
  - » *sawtooth*                a type of tooth

23

### Heads and compounds

- The plural form of a compound word is based on the plural form of the *head* of the compound word
  - » *toothbrush* --> *toothbrushes*
  - » *sawtooth* --> *sawteeth*
  - » *snowman* --> *snowmen*
- Is *walkman* a compound noun?
  - yes, but it is not normal



24

### Headless compounds

- Some compound words are *headless*
- How can you tell?
  - ♦ a walkman is *not* about a type of man
  - ♦ thus, the “head” is not what the word is about
  - ♦ this tell us that walkman is more like a new word than a compound word (e.g., electricity)
- For headless compounds the irregular plural form is not appropriate
  - ♦ no plural form “feels” correct because the word has no head

Purdue University



25

### Headless compounds

- Sony corporation suggests that the plural of walkman is

Walkman Personal Stereos

- A similar analysis explains the plural form of names

Toronto Maple Leafs (not Leaves)

Florida Marlins (not Marlin)

I am sick of all the Mickey Mouses in this administration. (not Mickey Mice)

Purdue University



26

### Conclusions

- Words follow rules
- Morphology / morphemes
- Lexicon
- Explains characteristics of language

Purdue University



27

### Next time

- Interpreting language
- Parsers
- More ambiguity
- Computers vs humans
- CogLab on Lexical decision due!
- *This is a valid sentence: “Buffalo buffalo buffalo buffalo buffalo buffalo buffalo.”*

Purdue University



28