What is the plural of walkman?

Words
PSY 200
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Lecture 27

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?

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

Words are special
● Words are not just a collection of letters
  • Word superiority effect
  • Judge a pair as being the same or different
  

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

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

Morphology

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

<table>
<thead>
<tr>
<th>duck</th>
<th>quacks</th>
</tr>
</thead>
<tbody>
<tr>
<td>ducks</td>
<td>quacked</td>
</tr>
<tr>
<td></td>
<td>quacking</td>
</tr>
</tbody>
</table>

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

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

Morphology

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

<table>
<thead>
<tr>
<th>teachable</th>
<th>teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>unteachable</td>
<td>teach</td>
</tr>
</tbody>
</table>

Suffixes

- English has lots of these derivational suffixes
- Examples of morphemes

-able -ify -ance -ism -ous
-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.
**Compounding**

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

```
  tooth  brush  unmicrowaveability
  toothbrush
```

**Rules**

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

```
  Nstem  Ninflection  Nstem  Ninflection
  dog    -s            wug    -s
```

- The creation of compound nouns also follows a simple rule

```
  Nstem  Nstem  Nstem
  tooth  brush  unmicrowaveability
```

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

**More detail on rules**

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

```
  Vstem  Astemaffix  Nstem  Nstemaffix
  crunch  -able      crunch  -er
```

**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 Darwinismans is not
  - -ian must attach to a root

```
  Nstem  Ninflection  Nstemaffix  Nrootaffix  Nroot
  Darwin  -s               -s           -ian
```

**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"; attach me to a verb stem
  - -er
    - noun stem affix; means "one who X" s"; attach me to a verb stem
  - ...

```
  Nstem  Ninflection  Nstemaffix  Nrootaffix  Nroot
  Darwin  -s               -s           -ian
```
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

Language families

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

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

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

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

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
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

Conclusions

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

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 buffalo.”*