More Experiments

• Spanish gender
  – all nouns are either masculine or feminine
More Experiments

• Spanish gender
  – All nouns are either masculine or feminine
  – Nouns pass the gender to the adjectives that modify them

    much* gente alt*
    │
    fem.

    Lots of tall peopleₐ
Spanish gender

- All nouns are either masculine or feminine
- Nouns pass the gender to the adjectives that modify them

\[
\begin{align*}
mucha & \quad \text{gente} & \quad \text{alta} \\
& \quad \text{fem.} & \\
\Rightarrow & \quad | & \quad \Rightarrow \\
\text{Lots of}_F \text{ tall}_F \text{ people}_F
\end{align*}
\]
More Experiments

- Spanish gender
  - All nouns are either masculine or feminine
  - Nouns pass the gender to the adjectives that modify them

```
much* edificio alt*
  |
  masc.
```

Lots of tall buildings

\[ \text{Lots of tall buildings}_M \]
More Experiments

• Spanish gender
  – All nouns are either masculine or feminine
  – Nouns pass the gender to the adjectives that modify them

\[ \text{muchaos} \quad \text{edificio}\quad \text{altos} \]
\[ \rightarrow \quad \rightarrow \quad \text{masc.} \]

Lots of\textsubscript{M} tall\textsubscript{M} buildings\textsubscript{M}
Spanish Gender

- Weird cases: masculine nouns take feminine article
  - $el_M \text{ águila}_F$
  - $el_M \text{ áncla}_F$
  - $el_M \text{ arma}_F$
    - $*la_F \text{ águila}_F$
    - $*la_F \text{ áncla}_F$
    - $*la_F \text{ arma}_F$
Spanish Gender

- Weird cases: masculine nouns take feminine article
  - el$_M$ águila$_F$
  - el$_M$ áncla$_F$  WHY?
  - el$_M$ arma$_F$
    - *la$_F$ águila$_F$
    - *la$_F$ áncla$_F$
    - *la$_F$ arma$_F$
Spanish Gender

• Traditional explanation
  – you do this to avoid [a á] sequences
    • *laₕ águilaₕ
    • elₕ águilaₕ

The el is just a variant form of la that is feminine, but just looks masculine
Spanish Gender

- So, only \textit{el} is OK before these words. The words are still feminine.
- Problem: people put all kinds of masculine modifiers before these words.
Spanish Gender

- Problem: people put all kinds of masculine modifiers before these words (Google search)

<table>
<thead>
<tr>
<th>Masculine</th>
<th>Feminine</th>
</tr>
</thead>
<tbody>
<tr>
<td>este agua</td>
<td>esta agua</td>
</tr>
<tr>
<td>82,900</td>
<td>210,000</td>
</tr>
<tr>
<td>ese hacha</td>
<td>esa hacha</td>
</tr>
<tr>
<td>1,140</td>
<td>1,170</td>
</tr>
<tr>
<td>aquel águila</td>
<td>aquella águila</td>
</tr>
<tr>
<td>240</td>
<td>421</td>
</tr>
<tr>
<td>mucho hambre</td>
<td>mucha hambre</td>
</tr>
<tr>
<td>13,700</td>
<td>138,000</td>
</tr>
<tr>
<td>todo el área</td>
<td>toda el área</td>
</tr>
<tr>
<td>122,000</td>
<td>383,000</td>
</tr>
<tr>
<td>poco agua</td>
<td>poca agua</td>
</tr>
<tr>
<td>34,500</td>
<td>136,000</td>
</tr>
<tr>
<td>un único área</td>
<td>una única área</td>
</tr>
<tr>
<td>129</td>
<td>14,100</td>
</tr>
</tbody>
</table>
Spanish Gender

- Problem: people put all kinds of masculine modifiers before these words (Google search)

<table>
<thead>
<tr>
<th>Masculine</th>
<th>Feminine</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>este agua</em></td>
<td><em>esta agua</em></td>
</tr>
<tr>
<td><em>ese hacha</em></td>
<td><em>esa hacha</em></td>
</tr>
<tr>
<td><em>aquel águila</em></td>
<td><em>aquella águila</em></td>
</tr>
<tr>
<td><em>mucho hambre</em></td>
<td><em>mucha hambre</em></td>
</tr>
<tr>
<td><em>todo el área</em></td>
<td><em>toda el área</em></td>
</tr>
<tr>
<td><em>poco agua</em></td>
<td><em>poca agua</em></td>
</tr>
<tr>
<td><em>un único área</em></td>
<td><em>una única área</em></td>
</tr>
</tbody>
</table>
Spanish Gender

• Answers
  – Lots of people have bad grammar
Spanish Gender

- **Answers**
  - Lots of people have bad grammar
    - But you can even find it in the writings of “good writers”
Spanish Gender

• Answers
  – Lots of people have bad grammar
    • But you can even find it in the writings of “good writers”

• I think these words are hermaphroditic (have both genders)
  – At least on the left side
• Evidence for this are masculine modifiers on left
  – *tanto ansia* so much anxiety
  – *ese arma* that arm
  – *buen alma* good soul
  – *propio agua* own water
• Even when separated by another word
  – *el abundante agua* the abundante water
  – *un único área* the only area
Spanish Gender

• So, gender doesn't radiate from noun to modifiers

\[
\begin{align*}
mucha & \quad gente \\
| & \quad alta \\
fem. & \quad\rightarrow\rightarrow \\
\text{Lots of}_F \text{ tall}_F \text{ people}_F
\end{align*}
\]
Spanish Gender

- Instead, people experience feminine modifiers around feminine nouns and masculine modifiers around masculine ones.
- They choose appropriately gendered modifiers by analogy, not by rule.
- The hermaphroditic nouns give best evidence of this.
Spanish Gender

• Examples: F=feminine modifier

F  F  F  F  F  F  F  F  F  F  F  F  F  F  F  F  F  F  F
Spanish Gender

• Examples: M=feminine modifier

M M M MM M M M M
M M M M M caso M M M M
M M M M M M M M
Spanish Gender

- Examples: M, F

M  F  M  F  M  M  M  M  M  M
F  M  F  M  agua  M  M  M  M  M
M  F  F  F  M  M  M  M  M  M
Hypothesis

• If gender assignment is rule-based error rates should be similar for:
  – post- and preposed modifiers.
  – different kinds of nouns.

• If gender assignment is analogical:
  – differing error rates are expected for different nouns.
  – different error rates for post- and preposed modifiers.
Experiment

- **Subjects:** 25 native Spanish speakers
- **Test items:**
  - Noun with an inflected modifier and uninflected modifier
    - *nuestra hambre constante*
    - *la peor ancla*
  - Items varied between prescriptively correct and incorrect
    - *nuestro/a hambre constante*
    - *el/la peor ancla*
  - Distractor items were included with number agreement
    - *humilde curas católicos*
Experiment

- **Test items**: Items varied on placement of inflected modifier (before or after noun)
  - *original arpa clásico/a*
  - *el/la mejor arma*
- 3 types of nouns:
  - Regular: *hermana, elemento, carne*
  - Transvestite: *problema, enigma, drama* (masculine, but look feminine)
  - Hermaphroditic: *arca, asta, haba* (Have both genders)
Experiment

- **Task:** Press *bien* or *mal* key depending on if words could appear together in a correct sentence.
- **Measure:** Number of correct/incorrect responses in each category.
- **Errors:**
  - Answering *mal* to a prescriptively good sequence:
    - *la dulce agua*
  - Answering *bien* to a prescriptively bad sequence:
    - *el dulce agua*
Results

- People made more errors on hermaphroditic and transvestite words (regardless of whether the modifier came before or after noun)
Results

- People made more errors on hermaphroditic and transvestite words (regardless of whether the modifier came before or after noun)
- More errors made on modifiers to the left of noun, especially for hermaphroditic nouns (and less so for transvestite nouns)