1. Problem: an agreement puzzle

Hoeksema (1988) first noticed the determiner-sensitive subject-verb agreement puzzle in (1) and (2).

(1) Non-universally quantified conjuncts
   a. The boy and the girl were given sweets.
   b. The boy and the girl was given sweets.
   c. An ethnic group and a tribe were documented.
   d. An ethnic group and a tribe was documented.

(2) Universally quantified conjuncts
   a. Every boy and every girl were given sweets.
   b. Every boy and every girl was given sweets.
   c. Each ethnic group and each tribe were documented.
   d. Each ethnic group and each tribe was documented.

2. Why is there such a subject-verb agreement difference?

- Hypothesis 1: no explanation, it’s just the way it is.
- Hypothesis 2: lexical ambiguity of ‘and’. There are two ‘and’ coordinators; the one in (1) forms a plurality, but the one in (2) does not.
- Hypothesis 3: competence & processing coarsening. The plural verb agreement in (1a) and (2a) is due to a direct NP coordination parse like (4a). The singular verb in (2b,d) obtains with an elliptical S coordination parse like (4b).

Chaves (2007) proposes that the grammar of subject-verb agreement behaves in a systematic way, and that the agreement puzzle is due to the interaction of performance and the grammar.

3. Pragmatic conditions, semantic ambiguity, and frequency

- Pragmatics: peculiar contexts are required.
- Semantics: complex and highly ambiguous

Unlike non-universally quantified conjuncts, universally quantified conjuncts yield complex ambiguities. Sentence (7a) either means that boys shook hands with girls, or that kids shook each other’s hands.

<table>
<thead>
<tr>
<th>Coordination type vs. Verb form</th>
<th>Table 2: t-tests: coordination type vs. verb number agreement</th>
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</thead>
<tbody>
<tr>
<td>the N and the N</td>
<td>2.390 0.189.994 0.048 0.210</td>
</tr>
<tr>
<td>each N and each N</td>
<td>2.223 0.099 0.489 0.207</td>
</tr>
<tr>
<td>each N and each N</td>
<td>2.256 0.089 0.444 0.299</td>
</tr>
</tbody>
</table>

This suggests that the less frequent the coordination type, the less likely for comprehenders to distinguish between singular and plural agreement, and is consistent with the hypothesis that the more frequent determiner-NP-coordination type, the greater the bias towards an NP coordination parse. Thus, unacceptable sentences like "the boy and the girl was thrilled about it are worse than *the boy and one girl was thrilled about it (although in our analysis both are grammatical)."

Acknowledgements

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References

Hoeksema, J. (1988). The semantics of non-boolean conjunctions, due to (i) their peculiar contextual requirements and (ii) the tendency for speakers to avoid complex semantic ambiguities. This frequency difference is observable in the BNC corpus.

4. Magnitude Estimation experiments

We conducted five Magnitude Estimation experiments (Bard et al. 1996; Covert 1997), manipulating determiner type (a, one, the, each, and every), and verb number (singular vs. plural) as experimental factors. All of our items had the following form: [DET NOUN; and DET NOUN; [NP PRED]]

The two determiners (DET) were identical for each item, the two nouns were different singular nouns for each item, and PRED was a scenario-appropriate adjective, participial verb, or prepositional phrase. This constitutes a 2-factor 5×2 design. We constructed 100 test items, each having ten versions, and counterbalanced across ten presentation lists. The nouns and adjectives were different for each item, and equally frequent (Kucera and Francis 1967). All ten lists had the same reference sentence (the modulus), the patient examined by the doctor was discharged yesterday. Forty participants were recruited, all undergraduate students native speakers of American English. The responses of the participants were grouped according to category, and log-transformed prior to analysis.

5. Coordination frequency vs. difference in verb acceptability

As usual in Magnitude Estimation, the raw score ratios of the participants were grouped according to category, and log-transformed prior to analysis to normalize distribution. The five t-tests are seen below.

The Pearson’s correlation between the effect-size r for universally quantified conjuncts (M=0.28, SD=0.189, N=5) and the proportions in the BNC frequency values in Table 1 (M=6843.2, SD=1119.264, N=5) approached significance (r(3)=.719, p=.085).

This suggests that the less frequent the coordination type, the less likely for comprehenders to distinguish between singular and plural agreement, and is consistent with the hypothesis that the more frequent determiner-NP-coordination type, the greater the bias towards NP coordination parses. Thus, unacceptable sentences like "the boy and the girl was thrilled about it are worse than *one boy and one girl was thrilled about it (although in our analysis both are grammatical)."