Avoiding ambiguity in Japanese and ASL

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The plan:
(1) Why is this an interesting (and difficult) question?
(2) Robust evidence from Japanese.
(3) Preliminary evidence from ASL.
(4) What kind of grammar can deal with this?

Functionalism: To what extent do the formal properties of language follow from its function?

Ambiguity avoidance would be a good functional property for languages to have. Do languages really do this grammatically?

English fixed word order?

BUT: Lots of unattested fixed word orders would also work.
English still has plenty of ambiguity.

Craig makes a very strong case that –ni is primarily motivated by ambiguity avoidance.

–ni is also used, however, when sentences wouldn’t otherwise be ambiguous.

(3) ha’ naj smak/xmak-ni smam,
CL he/ hit(AF) his, father
‘It’s he who hit his father.’

Craig, p. 218: “the mechanism has become optional...in a construction which is never ambiguous.”

While the appearance of –ni correlates strongly with ambiguity, it is not triggered by ambiguity.

Japanese has plenty of ambiguous sentences:

(1) Sumiko-to Jiro-no okaasan
Sumiko-CONJ Jiro-GEN mother
‘S and [J’s mother]’ OR ‘[S and J]’s mother’

(2) Taroo-wa Hanako-ga [ibun-o nagutta]-to omotteiru
Taroo-TOP Hanako-NOM self-ACC hit COMP thinks
‘T thinks H hit T.’ OR ‘T thinks H hit H.’

...but Japanese speakers are extremely careful to avoid ambiguity in certain situations.

In Japanese and (probably) ASL, syntactic processes occur if and only if ambiguity (of a particular type) would occur otherwise.

Jacaltec (Craig 1977): Generalized ambiguity avoidance

Word order is typically VSO; saw he her saw he him no case on Ns. ‘He saw her.’ ‘She saw him.’

→ Clefting could be ambiguous (1) CL S, V t. O ‘It’s he that saw her.’
(2) CL O, V S t. ‘It’s him that she saw.’

The Agent Focus (AF) suffix –ni disambiguates:

(1’) ha’ naj x’i-ni t. ix, (2’) ha’ naj xii ix t.
CL he. saw-AF her, CL him, saw she,
‘It’s he that saw her’ ‘It’s him that she saw.’

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While the appearance of –ni correlates strongly with ambiguity, it is not triggered by ambiguity.
Basic Japanese word order: Subject Object Verb

(3) Taroo-ga Hanako-o osore-ru
   Taroo-NOM Hanako-ACC fear-PRES
   "Taroo fears Hanako."

Objects can ‘scramble’ to the front of the sentence (→ OSV)

(4) Hanako-o, Taroo-ga ___ osore-ru
    (still ‘Taroo fears Hanako.’)

These subjects and objects are distinguished by morphology.
Subject = ___-ga Object = ___-o

Word order doesn’t matter; the sentence is always unambiguous.

If scrambling were allowed, these sentences would be ambiguous:

(8) “Taroo-ga Hanako-ga kowa-i.”

<table>
<thead>
<tr>
<th>Subject</th>
<th>Object</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-ga</td>
<td>H-ga</td>
</tr>
<tr>
<td>T is afraid of H.</td>
<td></td>
</tr>
</tbody>
</table>

SO: When morphology doesn’t distinguish between subjects and objects, word order does.
Either Subject-ga Object-ga Verb
or Subject = ___-ga Object = ___-o

Morphology doesn’t always distinguish subjects from objects.

Some verbs assign nominative –ga to both subjects and objects
zyoozu ‘good at’, nigate ‘bad at’, suki ‘fond of’, kowai ‘afraid of’, etc.
(Tsujimura 1996: 211; Kuno 1973: 81-82)

(5) Hanako-ga Taroo-ga kowa-i
    Hanako-NOM Taroo-NOM afraid-PRES
    ‘Hanako is afraid of Taroo.’

Scrambling is blocked in these double-nominative sentences:

(6) *Taroo-ga Hanako-ga ___ kowa-i
    Taroo-NOM Hanako-NOM afraid-PRES
    ‘Hanako is afraid of Taroo.’

Scrambling may occur when either the subject or the object is missing its case particle:

(10) Taroo-o, Hanako-∅ ___ osore-ru
    Taroo-ACC Hanako-NOM fear-PRES
    ‘Hanako fears Taroo.’

(11) Taroo-∅, Hanako-ga ___ osore-ru
    Taroo-ACC Hanako-NOM fear-PRES
    ‘Hanako fears Taroo.’

Scrambling cannot occur when both case particles disappear:

(12) *Taroo-∅, Hanako-∅ ___ osore-ru
    Taroo-ACC Hanako-NOM fear-PRES
    ‘Hanako fears Taroo.’

Again, this prevents ambiguity by making word order consistent:

Subject-∅ Object-∅ Verb

Either word order or morphology always distinguishes subjects from objects.
2: Morphological ambiguity is what matters

(13) Tarō-ga jishin-ga kowa-i
    Tarō-NOM earthquakes-NOM afraid-of-PRES
    ‘Tarō is afraid of earthquakes.’

The alternative, ‘Earthquakes are afraid of Tarō’, is implausible.

But scrambling is still blocked:

(14) *jishin-ga Tarō-ga ___ kowa-i
    earthquakes-NOM Tarō-NOM ___ afraid-of-PRES
    ‘Tarō is afraid of earthquakes.’

3: Morphological ambiguity really matters

zyoozu must have an animate, human subject.

(15) Tarō-ga tenisu-ga zyoozu-da
    Tarō-NOM tennis-NOM good-at-PRES
    ‘Tarō is good at tennis.’

Scrambling is still blocked, even though there’s no (other) grammatical interpretation of the scrambled sentence.

(16) *tenisu-ga Tarō-ga ___ zyoozu-da
    tennis-NOM Tarō-NOM ___ good-at-PRES
    ‘Tarō is good at tennis.’

Conclusions from Japanese:

• In every sentence, the subject and object must be distinguished.
• Case morphology usually accomplishes this.
• When S+O are morphologically identical, scrambling is blocked, so that word order distinguishes the arguments.
• This is about making a morphosyntactic distinction between subjects and objects, not just making the sentence understandable.

Does any other language care about avoiding ambiguity?

ASL: More ambiguity avoidance

(this time, in the agreement system)

Four important features of ASL:

• Referents may be assigned to locations in space.
• ASL includes manual signing, and also expresses grammatical information nonmanually (using the head/face).
• ASL verbs can agree with their subjects and objects.
• Subjects and objects are not always overtly present in ASL sentences.


Manual agreement

Agreeing verbs move from subject location to object location.

(17) JOHN i i GIVE j MARY j BOOK
    ‘John gives Mary a book.’

(18) JOHN i i SHOOT j FRANK j
    ‘John shoots Frank.’

Nonmanual agreement

Head tilt marks the subject

Eye gaze marks the object

Nonmanual agreement is optional.

(19) [head tilt] JOHN i i SHOOT j FRANK j
    ‘John shoots Frank.’

(20) [no head tilt] or [eye gaze] JOHN i i SHOOT j FRANK j
    ‘John shoots Frank.’
Nonagreeing verbs don’t have manual agreement. They do have the same optional nonmanual agreement as agreeing verbs.

Agreement and ambiguity avoidance

The subject and object of each verb must be indicated somehow:

<table>
<thead>
<tr>
<th></th>
<th>Agreeing verbs</th>
<th>Nonagreeing verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual agreement</td>
<td>ALWAYS</td>
<td>NEVER</td>
</tr>
<tr>
<td>Nonmanual agreement</td>
<td>SOMETIMES</td>
<td>SOMETIMES</td>
</tr>
<tr>
<td>Can subjects and objects be dropped?</td>
<td>ALWAYS</td>
<td>Only when nonmanual agreement is present</td>
</tr>
</tbody>
</table>

Agreeing verbs: Subjects (and objects) can always drop, since they’re always indicated by manual agreement.

Nonagreeing verbs: Subjects and objects can only drop when they’re indicated by nonmanual agreement.

Ambiguity avoidance is active in these grammars:

**ASL**
Subjects and objects must be indicated somehow:

If a subject or object is not indicated morphologically, by (manual and/or nonmanual) verb agreement, it must be overtly present in the sentence.

**Japanese**
Subjects and objects must be distinguished somehow:

If a subject and object are morphologically identical (both marked -ga or -Ø), scrambling is blocked, making the word order consistently S-O-V.

This isn’t universal: Texistepec Popoluca (Reilly 2002)

“Speakers’ intuitions in a plausibly equi-biased morphologically ambiguous sentence are split 50/50 between VSO and VOS.” (p.c.)

Speakers readily produce both VSO and VOS sentences in identical contexts.

(27) maʔ di-agaʔ maj-diaʔa kany-daʔa
PERF 35/30-kll Tomás-íŋ-mec jaguar-íŋ-mec
‘Tomás killed the jaguar.’

‘The jaguar killed Tomás.’
To account for these patterns, the grammatical mechanism for ambiguity avoidance must be:

- Strong enough to take effect whenever it sees morphological (though not necessarily semantic) ambiguity. (Japanese: ‘good at tennis’)
- Flexible enough to allow particular kinds of ambiguity to surface in particular languages. (Japanese possessives, Texistepec Popoluca VSD/LOS)

Proposals that are too strong:

- Exceptionless universal grammatical filters (e.g. Chomsky 1981)
- Bidirectional Optimality Theory (e.g. Aissen 2003, Kuhn 2001, Lee 2001, Steiβer 2006)

Proposals that are too weak:

- Extragrammatical parsing strategies (e.g. Kuno 1963b)

Solution: Use an OT grammar

OT grammars consist of language-specific rankings of (arguably) universal constraints.

The constraint *subject arbitr. can penalize subject-object ambiguity while allowing e.g. ambiguous possessives.

*subject arbitr. Syntactic structures with different subjects must have different surface forms.

This constraint can be ranked high enough to be active in Japanese and ASL, while being ranked low enough to be inactive in Texistepec Popoluca.

(A tricky part: Ambiguity is a property of pairs of sentences. This OT grammar has to look at more than one sentence at a time to be able to detect ambiguity.)

References


Kuno, Susumu (1973) Syntactic structures with different subjects must have different surface forms.

Lampert, Jason (2001) A focused object in a Nom-Nom sentence can scramble, even though this causes ambiguity.

Taroo-ga Hanako-ga kowa-i

This is ambiguous with: Taroo-ga Hanako-ga kowa-i

** Taroo is afraid of Hanako.**

A focused object in a Nom-Nom sentence can scramble, even though this causes ambiguity.

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\[ \begin{array}{c|c|c|c|c|c}
  T-ga | H-ga & kowa-i & * & T-o | H-o & kowa-i & * \\
  T-o | H-o & kowa-i & * & T-o | H-o & kowa-i & * \\
\end{array} \]
Bidirectional OT (e.g. Aissen 2003, Kuhn 2001, Lee 2001, Steibels 2006)

Intuitively: Ambiguity is hard because hearers can’t recover the intended meaning.

Formally: \( /M/ \rightarrow \text{PRODUCTION} \rightarrow "F" \rightarrow \text{COMPREHENSION} \rightarrow /M/ \)

\( \langle /M, "F" \rangle \) is bidirectionally optimal iff \( /M = /M' \)

/Hanako is afraid of Taroo/

\( \rightarrow \text{PRODUCTION} \rightarrow "\text{Taroo-ga Hanako-ga kowa-i}" \)

\( \rightarrow \text{COMPREHENSION} \rightarrow /\text{Taroo is afraid of Hanako}/ \)

\( \rightarrow \text{NOT} \rightarrow \text{COMPREHENSION} \rightarrow /\text{Hanako is afraid of Taroo}/ \)

\( \rightarrow \langle /\text{Hanako is afraid of Taroo}/, "\text{Taroo-ga Hanako-ga kowa-i}" \rangle \)

WHAT ABOUT ALL THE OTHER AMBIGUITY IN JAPANESE?

Jacaltec: ‘Unnecessary’ –ni when subject = object possessor

ha’ naj smak/mak-ni t, smam
CL he, h[AF] his, father

‘It’s he, who hit his, father.’

Even without –ni, this sentence isn’t ambiguous:

‘ha’ naj smak smam t, ‘It’s him, who his, father hit.’

…because the second of two coreferential pronouns is always deleted:

\( \text{smak naj, smam naj, smak smam naj, naj} \)

‘He, hit his, father.’

‘His, father hit him.’

Cleft naj: ha’ naj smak smam naj, ha’ naj smak smam naj