How Pro-drop Killed V2

Dynamics of Language

February 6, 2007

Assume there is no pro-drop. Consider the following V2 and SVO grammars, with the irrelevant categories omitted.

(1) a. V2: \{SV, XVS\}, where \(P\{SV\} = a\).
   b. SVO: \{SV, SXV, XSV\}, where \(P\{SV\} = b\)

Recall from the readings that \(a \approx 0.7\) and \(b \approx 0.9\).

Consider these grammars interacting with pro-drop. Specifically, assume that the frequency of pronoun subjects is \(p\), of which \(d\) is dropped, whereas that of lexical NP subjects is \((1 - p)\). Let the composite grammars be \(V2'\) and \(SVO'\). Note that for the SV pattern in \(V2'\), no subject can be dropped due to the V2 requirement. The expressions they generate are as follows, where the subscript indicates the type of subject:

(2) a. \(V2'\): \{SV, XVS\(_{NP}\), XVS\(_{P}\), XV\}.
   b. \(SVO'\): \{SV\(_{NP}\), SV\(_{P}\), V, SXV\(_{NP}\), XSV\(_{P}\), XV, XSV\(_{NP}\), XSV\(_{P}\), XV\}

The advantage of \(V2'\) over \(SVO'\) is:

(3) \[P\{XVS\(_{NP}\), XVS\(_{P}\}\} = (1 - a)[(1 - p) + p(1 - d)] = (1 - a)(1 - pd)\]

The advantage of \(SVO'\) over \(V2'\) is:

(4) \[P\{V, SXV\(_{NP}\), XSV\(_{P}\), XSV\(_{NP}\), XSV\(_{P}\}\} = bpd + (1 - b)(1 - pd)\]

In order for \(SVO'\) to eliminate \(V2'\), we must have:

\[bpd + (1 - b)(1 - pd) > (1 - a)(1 - pd)\]

Using the values of \(a = 0.7\) and \(b = 0.9\), we have

\[0.9pd + 0.1(1 - pd) > 0.3(1 - pd)\]
$0.9pd > 0.2(1 - pd)$

$pd > 2/11$

Clearly, if $d = 0$, that is, the language is not pro-drop, then V2' could never lose, as we predicted before.

If $pd > 2/11$, that is, if more than 18% of subjects are null, then V2’ would be eliminated by SVO'. Example (15) in Yang (2000; Language Variation and Change), which is based on Roberts (1993:155), shows that by early Middle French, the frequencies of pro in three texts are as follows:

<table>
<thead>
<tr>
<th>Text</th>
<th>SV</th>
<th>VS</th>
<th>Null</th>
</tr>
</thead>
<tbody>
<tr>
<td>Froissart, <em>Chroniques</em> (c. 1390)</td>
<td>40%</td>
<td>18%</td>
<td>42%</td>
</tr>
<tr>
<td><em>15 Joyes (14esme Joye)</em> (c. 1400)</td>
<td>52.5%</td>
<td>5%</td>
<td>42.5%</td>
</tr>
<tr>
<td>Chartier <em>Quadrilogue</em> (1422)</td>
<td>51%</td>
<td>7%</td>
<td>42%</td>
</tr>
</tbody>
</table>

Clearly, the condition is satisfied, and V2' must lose out to SVO'.