Introduction
Principles of Universal Grammar, including Economy Principles, help a child acquire his or her (internalized) grammar. These same Principles determine language change (and language evolution), in particular the change that's been called grammaticalization. Thus language development can be seen in terms of grammaticalization which makes language change and acquisition explainable in a uniform way (see also Bickerton 1990; Faingold 2003 and others).

In this paper, I focus on two Economy Principles (HPP and LMP) and show that they are relevant to language change and development (and creolization). The outline is (1) Minimalism, (2) Economy Principles, (3) Language Change, and (4) Development.

1 Phrase structure

1.1 Merge
Basic derivation: Lexicon, selection, merge, move (=internal merge), and agree; Interpretation at LF + PF. Merge is 'put two linguistic entities together':

(1) a. . > . > .
   on chair sitting . Bo .
   on chair sitting .

(2) Principles connected with Merge
a. Merge involves projection, hence headedness, specifiers, and complements
b. The binary character of Merge results in either:
   (i) . . .
   (ii) .

c. There is c-command of the specifier over (the Head and) the Complement, resulting in the special nature of the specifier.

Through (2a) and (2b):
(3) a. VP
   Bo V' YP X' ZP
   sitting P NP Spec
   on chair head complement
   b. XP

and Argument structure (examples are from Hale & Keyser 2002):

(4)  
\[ \begin{array}{ll} 
\text{a.} & X \quad Y \quad \text{ZP} \quad X \\
\text{b.} & X \\
\text{X} & \quad \text{laugh} & \quad \text{book} & \quad \text{Y} & \quad \text{with/on} & \quad \text{shelf} \\
\text{c.} & \quad \text{ZP} & \quad \text{Y} & \quad \text{sky} \\
\text{d.} & \quad \text{X} & \quad \text{sky} & \quad \text{clear} \\
\end{array} \]

(5)  
\[ \begin{array}{ll} 
\text{a.} & \text{my open that (Peter 2;0.7 Bloom 1970)} \\
\text{b.} & \text{I'm put putting these bars in there (Allison 2:10 Bloom 1973)} \\
\end{array} \]

These structures are possible even in adult speech:

(6)  
\[ \begin{array}{ll} 
\text{a.} & \text{Class in session} \\
\text{b.} & \text{Martha Stewart in jail} \\
\text{c.} & \text{Him worry? (from Progovac et al in press)} \\
\end{array} \]

Merge is the "Great Leap Forward' in the evolution of humans" (Chomsky 2005: 11). A slight rewiring of the brain might have made the operation Merge possible and, in its turn, Merge made syntax possible by combining words into multiple unit expressions, with in principle infinite recursion. Syntax was "inserted into already exiting external systems", namely the sensory-motor system and system of thought (Chomsky 2002: 108).

Through (2c):

(7)  
\text{The uncle of Kerry voted for himself in 2002.}

(8)  
\[ \begin{array}{ll} 
\text{a.} & \text{*The news that nobody cheated created any uproar.} \\
\text{b.} & \text{Nobody created any uproar.} \\
\end{array} \]

1.2 Three layers: thematic, grammatical, discourse-related

Grammatical categories (They emerge after V, N, etc; both in language evolution and in the child's language though there is a debate about this):

(9)  
\[ \begin{array}{ll} 
\text{CP} & \quad \text{Discourse} \\
. & \quad C' \\
C & \quad \text{TP} \quad \text{Grammatical} \\
\text{that} & \quad \text{Laurie} \quad \text{T'} \\
\text{T} & \quad \text{VP} \quad \text{Thematic} \\
\text{will} & \quad \text{Laurie} \quad \text{V'} \\
\text{V} & \quad \text{DP} \\
\text{like} & \quad \text{the story} \\
\end{array} \]

Stages of movement, e.g. to the left of Neg:

(10)  
\text{no going away (Eve, 20 months)}
(11) I no want go home (Peter, 26 months)
(12) *pas manger*
    not eat (Nathalie, 21 months)
(13) *veux pas lolo*
    want not water (Nathalie, 24 months; examples from Pierce 1992: 55; 65)

So, within UG, there is Merge, and principles connected with it, and three layers of categories (VP, TP, CP).

2 **Economy Principles**

Within Minimalism (from Chomsky 1995 on), Economy has played a role (fewest steps, last resort etc). So, in building derivation, there are choices. There are two principles in particular that we will discuss:

(14) **Head Preference Principle (HPP):**
Be a head, rather than a phrase.

(15) **Late Merge Principle (LMP):**
Merge as late as possible
(both from van Gelderen 2001; 2004)

2.1 According to the HPP, the speaker will prefer to construct the structures in (a) rather than those in (b):

(16) a. CP 
    b. CP
    
    C’ PP C’
    C TP C TP
    that we talked about whom
    we talked about whom

(17) a. TP
    b. TP
    T’ DP T’
    D … T …
    je je

The same is true with the NegP and ASPP.

2.2 The LMP is very obvious in cases of infinitival *to* where speakers construct it higher and higher, as in (18a), (19), but not when a C is not available, as in (20). The structure in (a) is the preferred one:

(18) a. It would be unrealistic **not** expect to pay higher royalties (BNC-CSS 245).
    b. It would be unrealistic **not to** show them to be human (BNC-CBF 14312).

(19) a. - as a request **not to** - (CSE-WH97A).
    b. This is to try **not to** overturn the ... (CSE-WH97A).
At first, the darkening official mood seems not to have troubled Prokofiev (BNC-ABJ 524).

Another shift is for seem to become an auxiliary (first it seems 1200; first clear ...seems to 1388):

It seems that ...: google 54 million; ... seem(s) to ...: google 506 million.

Economy Principles are UG principles at work in the internalized grammar and hold for merge (projection) as well as move (checking). Syntax is inert and all variation is in the lexicon. Hence there is a choice of pronouns as D or DP (HPP) and verbs as V or Aux (LMP).

3 Grammaticalization is Economy

Grammaticalization is a linguistic kind of change that often involves a full phrase becoming one word, or a verb becoming an auxiliary. This has been examined by both functionalist and, more recently, formal linguists.

3.1 Spec to Head (HPP)

Neg DP > Neg Adv > Neg > zero

Men ne cunnōn secgan to soðe ... hwa

Man not could tell to truth ... who

'No man can tell for certain ... who'. (Beowulf, 50-2)

ne fand Þær nan Þing

not found there no thing (Peterborough Chronicle)

I cannot answere (Cloud of Unknowing, HC-ME 3)

Figure 1: The Negative Cycle

Many other languages have this:

Pat mæli ek eigi

that say-1S I not

Old Norse
'I am not saying that' (from Faarlund 2004: 225).

(28) *Men detta ække et forslag som vi har interesse av* Norwegian varieties
but that is-not a proposal that we have interest in
'But that's not a proposal we are interested in' (from Solstad 1977: 70).

(29) *Eg har ikke aldri smakt sånne brød* Sappen Norwegian
I have not never tasted such bread
'I haven't ever tasted that kind of bread' (Solstad 2002).

(30) *Idtjim (manne) daejrieh* Southern Sami
NEG-PAST-1S (I) know
'I didn't know' (from Bergsland 1994: 44).

(31) *In leat goassege dahkan dan* Northern Sami
NEG-S-1 be never do-PART it-ACC
'I have never done that' (Trosterud p.c.).

(32) *En ole koskaan maistanut sellaisia leipiä* Finnish
NEG have never tasted such bread
'I have never tasted such bread' (from Sollid 2002).

| Demonstrative pronoun *that* to complementizer | Demonstrative pronoun to article |
| Relative *who* possibly to head | Adverb to aspect marker |
| Adverb to complementizer | Full pronoun to agreement |
| Negative adverb to negation marker | [VO]S > [V]SO |

Table 1: Examples of the change from specifier to head

### 3.2 Late Merge
Non-theta-marked elements can wait to merge outside the VP (Chomsky 1995: 314-5). If, for instance, a preposition can be analyzed as having fewer semantic features and is less relevant to the argument structure (e.g. *to*, *for*, and *of* in ModE), it will tend to merge higher (in IP or CP) rather than merge early (in VP) and then move

For instance, the causative PP *for* DP > Spec CP (=LMP) > Head (=HPP)

(33) *þæt he for eaxlum gestod*
that he before shoulders stepped
'that he stood in front of ...'. (*Beowulf* 358)

(34) *for werefyhtum ... ond for arstafum usic sohtest*
for fighting ... and for support (you) us sought
'You wanted us to help fight' (*Beowulf* 457-8).

(35) *ouþer for untrumnisse ouþer for lauerdes neode ouþer for haueleste ouþer for hwilces cinnes ouþer neod he ne muge þær cumon*
either from infirmity or from his lord's need or from lack of means or from need of any other kind he cannot go there' (PC, anno 675).

(36) *forþam Trumbriht wæs adon of þam biscopdome*
'because T had been deprived of his biscopric' (PC anno 685).

(37) *ac for þæm he hie us near sint, we ... ne magon ...*
but for that that they us close are, we ... not may ...
'but because they are near to us, we can't ...' (*Orosius*, Bately 122.18-9).
(38) for þæt ilc gær warth þe king ded
because (in) that same year was the king dead (PC, 1135, 6)

(39) Locrin 7 Camber to þon scipen comen. for to habben al þa æhte
Locrin and Camber to the ships came for to have all the goods
‘Locrin and Camber came to the ships to take all the goods' (Layamon, Caligula 1113-4).

<table>
<thead>
<tr>
<th>For, from P &gt; C</th>
<th>On, from P to ASP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Like, from P &gt; C</td>
<td>To: P &gt; ASP &gt; M &gt; C</td>
</tr>
<tr>
<td>Modals and do: v &gt; ASP</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Examples of the change from head to higher head.

(40) Those who offend actually, are most grievously punished (OED 1660 example).

(41) Actually, it is kind of an interesting problem (CSE-FAC97).

(42) a. CP
    AP  C
    Actually C TP  C IP
    ...  ...  ...  VP
    a c t u a l l y

3.3 Economy and Renewal: internal and external change

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XP
Spec X'    X
↑      YP
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Figure 2: The Linguistic Cycle

(43) **Specifier Incorporation Principle (SIP)**
When possible, be a specifier rather than an adjunct.

Examples involve Neg and Wh and Subjects.

Von der Gabelentz (1891: 256) uses "Deutlichkeit" ('clarity') and "Bequemlichkeit" ('comfort') as important (competing) factors. Jespersen (1922: chapter 14, §6) discusses an 'Ease Principle', which mainly deals with articulatory ease of pronunciation, and puts it this way: "the correct inference can only be that the tendency towards ease may be at work in some cases, though not in all, because there are other forces which may at times neutralize it or prove stronger than it". Van Gelderen (2004): prescriptivism (e.g. Rule prohibiting P-stranding) and innovation both interacting with Economy.
4 Grammaticalization in Language Use and Development

UG Principles: guidance to the child (in acquisition) and the adult (in the derivation).

4.1 The Head Preference Principle

English Preposition-stranding:

(44) Who did you talk to who?
(45) To whom did you talk to whom?

Children:

(46) those little things that you play with (Adam 4:10, from Diessel 2004: 137).

Relative pronouns:

Children: 56% that, 42% zero, 2% who (Diessel 2004)

CHILDES, Kuczaj corpus, Abe, age 4-5: 82% that, 18% wh-. There is no evidence that the wh is not a head, however, since whom/to who do not occur:

(47) a dragon that was this little (Abe, 4;0.16)
(48) You know the round part where they dig (Abe 4; 1.5)

Adults: spoken 80-90% that (or zero)
written 10-20% that

In speech, 86% of prepositions are stranded, whereas in writing, 7% are.

(49) I haven't been to a party yet that I haven't got home the same night.

Other CP phenomena:

(50) Les enfants que jouent là Colloquial French
the children who play there
‘The children who are playing there' (from Joseph 1988)

(51) Kven du såg Norwegian variety
Who you saw
‘Who did you see' (from Åfarli 1985: 6).

(52) Ka for nokka sa dokker Norwegian variety
what for something said you
‘What kind of thing did you say' (from Taraldsen 1985: 21).

(53) Kisana (ki) to ti don sa liv la Mauritian Creole
who that you T give DEM book the
‘Who did you give this book to’? (from Adone & Vainikka 1999: 78)

(54) *Kote ki nu pe ale Mauritian Creole
where that we ASP go
‘Where are we going’? (from Adone & Vainikka 1999: 79)

(55) Kote nu pe ale Mauritian Creole
where we ASP go
**Other Neg phenomena:**
Unlike sub- or superstratum languages, the NEG in HC was put in a head position:

(56) Jan pa t- av- ale nan mache Haitian Creole
Jan not ANT IRR go in market
`Jan wouldn't have gone to the market (DeGraff 1993: 65)

**TP: Pronouns > agreement**
(57) She’s very good, though I perhaps I shouldn’t say so (BNC HDC)
(58) if I had seen her, er prints I maybe I would of approached this erm differently (BNC F71).
(59) I actually I'd like to see that again (BNC-HMN 901).
(60) I always get something wrong, I always I kept, I kept getting to kiss her flatmate's chest (BNC-KDA 5676).

<table>
<thead>
<tr>
<th></th>
<th>uncliticized</th>
<th>cliticized</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>2037</td>
<td>685 (=25.%)</td>
<td>2722</td>
</tr>
<tr>
<td>you</td>
<td>1176</td>
<td>162 (=12.1%)</td>
<td>1338</td>
</tr>
<tr>
<td>he</td>
<td>128</td>
<td>19 (=12.9%)</td>
<td>147</td>
</tr>
</tbody>
</table>

Table 3: Cliticization to pronouns in CSE-FAC (significant between first and second and second and third at p < .001).

(61) J'ai vu ça. French
I-have seen that
(62) *Je probablement ai vu ça French
I probably have seen that
(63) c'est que chacun il a sa manière de ... Swiss SF
(Fonseca-Greber 2000: 338).
(63) Gnum a m capiss Torino
Nobody he me understands (from Poletto 2004)
(65) 'ə:n~i `an~ n~eok O'odham
I 1.IMPF speak-IMPF
`I am/was speaking' (Zepeda 1983: 61).
(66) eke ma lere jo ... ek furgete nau Bernice Dutch Creole
I will teach you ... I forget now
(67) no:, ekan tel didə BDC
not I-can tell that (Kouwenberg 1994: 483; 489)

French kids have no difficulty. Even though Subjects often appear after the V, the (weak) pronouns never do:

(68) moi je veux regarder
me I want watch (Gregoire 27 months, Pierce 1992: 96)
(69) Moi je sautes et je descend
me I jump and I go-down
'As for me, I jump and go down' (Philippe, 26 months, Pierce 1992: 97)

4.2 The Late Merge Principle

Complementizers are late merged prepositions
Josefsson (2000: 398): Swedish "children first acquire the PP and then, directly after that the subordinate clause". She divides the acquisition into I no Ps; II occasional P; III Ps and then Cs. "most often, the children do not start using complementizers at all until they have reached a 90% us of prepositions" in obligatory contexts.

(70) precis som en kan/ som en kanin
just like a rab/ like a rabbit
(71) grisen, den som heter Ola
pig that who is-called Ola
(Embla, 27 months, both from Josefsson 2000: 410)

Bloom (1991: 269) on English: addition, location, and time are used for cause around 25 months:
(72) hold de ladder and e won't fall down.

CHILDES, Kuczaj corpus, English like and for show the same data as in Swedish:
(73) like a cookie (Abe, 3.7)
(74) no the monster crashed the planes down like this like that (Abe, 3.7)
(75) Daddy # do you teach like you do [/] like how they do in your school? (Abe, 4.10)

Same corpus with for:
(76) Mom # this white one for me? (Abe 2.7, file 25)
(77) this picture is mine for myself (Abe 2.7, file 25)
(78) this uh be a cave for [/] for # what you say? a Thanksgiving one this uh be a cave. (Abe 2.11, file 54
(79) two Dad # how come some people have cookies for lunch sometimes? (Abe 3.7, file 116)
(80) ok then we could go way # way # way down from the stairs and dig for that rock I saw (Abe 3.7, file 116)
(81) because people don't use hatchets for hunting butterflies (Abe 3.7, file 116)
(82) it's not too high up # but I'm waiting for Silver to get ready. (Abe, 5.0, file 210

Wh merged late:
(83) who it belongs to it (Peter 2:6.14)

Auxiliaries are late merged verbs
Wanna is the first (semi)-modal to appear, followed by gonna and hafta, before can't (Stephany 1986: 387).
5 Conclusion

If two principles explain language change, they have to be used by learners and users to reanalyze the data so that the change can take place. I have shown that pronouns become agreement markers, negative DPs negative heads, and that complementizers that are heads are preferred. This follows from the HPP. I have also shown how the LMP is used to reanalyze verbs as auxiliaries and prepositions as complementizers.

Grammaticalization results in a linguistic cycle, in which full phrases become heads and then disappear. The loss has to be replenished and this is either through late Merge of lexical categories or through the incorporation of adverbial elements (the SIP).

Notes

The child data used are from the CHILDES database (http://childes.psy.cmu.edu). The data for Abe are described in Kuczaj (1976), from Gloria in Bates et al. (1988), and those from Peter and Allison in Bloom (1991).

References

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