Reduction and Coalescence: a Conspiracy resolving the Violations of *COMPLEX

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A typical problem in phonological acquisition is the development of consonant clusters. It has been reported in the literature that children always pass through a stage in which consonant clusters are produced 'incorrectly' and all these productions tend to be unmarked in structure. The most common type is reduction of the cluster to a single consonant, in order that unmarked or less marked syllable shapes surface (cf. among others, for English, Barlow, 1997; Barlow & Dinnsen 1998; Chin & Dinnsen, Gnanadesikan, 1996, Ohala, 1996; for Dutch, Fikkert, 1994, Lohuis-Weber & Zonnefeld, 1996; for German, Grijzenhout & Joppen, 1998; for Greek, Drachman, 1973a; Kappa, 1999, forth.; Tzakosta, 2001; to appear). In the case of child Greek the constraint *COMPLEX is ranked very high, specifically, it is undominated (cf. Optimality Theory, Prince & Smolensky, 1993). Therefore the cluster sequences are always reduced to a single consonant, although it raises a MAX-IO violation (McCarthy & Prince, 1995). If the target cluster consists of [OBSTRUENT+SONORANT] segments, then it is reduced to the less sonorous (or to the stronger) segment, specifically, to the obstruent as in (1a, 1c) or a substituted obstruent as in (1b), resulting in an unmarked syllable with a maximum rise in sonority slope toward the vowel (Clements, 1990).

(1)

	Target word	Child's output	Age	Gloss
a) STOP + SONORANT:	ˈ kleo	ˈkeo	2;2	'(I) cry'
b) FRICATIVE + SONORANT:	ˈ vreçi	ˈbeki	2;2,20	'(it) rains'
c) FRICATIVE + SONORANT:	ˈ vreçi	ˈveçi	2;9,7	'(it) rains'

In the cases of target words with [OBSTRUENT+OBSTRUENT] clusters surfaces only a stop. In (2) we posit some relevant data.

(2)

a) STOP+FRICATIVE	ˈksilo	ˈcilo	2;2,20	'wood'
b) FRICATIVE+ STOP	ˈskala	ˈkala	2;5,9	'stairs'
	ˈspiti	ˈpiti	2;2/2;9,13	'house'

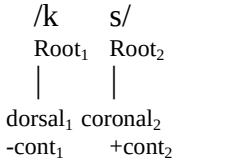
The above examples in (2) are also cases of reduction to the less sonorous consonant, i.e. the stop. Within the natural class of obstruents, fricatives are universally more sonorous than stops (*M/FRICATIVE>>*M/STOP). We assume that at this stage of phonological development the reduction is not only sonority-driven, but is also based on the selection of the least marked among the obstruents, i.e a non-continuant segment (STOP). Therefore we assume that the selection of a stop is a form of an emergent unmarkedness, due to the action of markedness constraint *[cont], whose effects are evident, even if is low ranked. However in the cases of /s+ STOP / or /STOP+s/ sequences the output consonant that is realized is not always one the input segments. In some cases, in order to avoid a violation of *COMPLEX, the child coalesces these clustered segments. A single consonant is produced that combines features from both of the segments that make up the cluster (cf. Gnanadesikan, 1996). The forms in (3) show how the /s+Stop/ or /Stop+s/ clusters are coalesced.

(3)

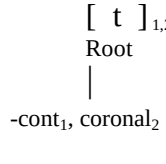
Target word	Child's output	Age	Gloss
ˈeksi	ˈeti	2;2,20	'six'
ˈmaska	ˈmata	2;2,20	'mask'
ˈaspa	ˈata	2;2,28	'proper name, FEM'

In addition to the segmental input/output correspondence (cf. McCarthy & Prince, 1995), we assume that features may stand in a correspondence relation. Whether an input and an output correspond depends on whether some features of these segments correspond. In other words, a Root node of the input and of the output will stand in a correspondence relation if features that they dominate correspond as in (4a).

(4a) A fully faithful Correspondence



(4b) The representation of Coalescence



Since in (4b) there is a retention of features of the two input segments /k/ and /s/ (in either order) in a single output segment [t], the correspondence of the retained segment must be considered. In the coalesced output we have underparsing of features rather than whole segments. The coronality of /s/ is retained as well as the continuancy of /k/. The Root node of the output segment [t] will share the correspondence of all its features and will have a double correspondence with both input segments /k/ and /s/. This is indicated through the use of indices from each of the input segments. The output segment [t] is not a MAX(F)-IO violation since it contains features from both input segments /k/ and /s/, respectively. It is a *MC violation in the sense of Lamontagne & Rice (1995) because its Root node has a double correspondence, and thus does not stand in one-to-one relationship with the input. Through the coalesced segment [t], the child realizes the unmarked feature from every input segment, i.e the unmarked manner feature (-cont) and the unmarked place feature (coronal) (Emergence of the unmarked). There is a clear functional unity between Reduction and Coalescence. Both serve to resolve violations of *COMPLEX. Such functional unity of processes within a language is known as *conspiracy* (Kisseberth, 1970). We will give an analysis of *COMPLEX conspiracy, one which uses no other constraints than those independently motivated by the above cases. In the data in (2) and (3) we have two *COMPLEX effects; we wonder if both can be related to a violation of some correspondence constraint without running into a constraint paradox. The coalesced output segment [t] violates the LINEARITY-IO (or UNIFORMITY) constraint, while the reduced output segment [k] violates the MAX-IO constraint. How could both, at the same time, be the lowest-ranking correspondence constraints in the constraint hierarchy? In order to answer this question, we have to take into account the *domains***.** In the /s+Stop/ or /Stop+s/ clusters, reduction applies word-initially, specifically, at the left edge (head) of the trochaic foot that constitutes the minimal prosodic word in child Greek (cf. Kappa, 1998, 2002). In contrast, coalescence applies word-internally. In other words reduction occurs in a prominent position such as the head of the prosodic word (stressed/word-initial syllable), whereas coalescence occurs in a non-prominent position as the word-medial/unstressed syllable. We claim that in prominent positions segmental or featural contrasts are often maintained, though they may be neutralized in non-prominent positions as in (3), e.g. the featural contrast of the [labial] or [dorsal] specified place of articulation is retained in (2), but it is neutralized in (3) resulting in an unspecified (non-continuant coronal) segment.