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Are children's grammars rogue grammars? Glide substitution in branching onsets

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Abstract

This paper focuses on the consonant+glide (CG) stage in children's realization of branching onsets, the point in development when the liquid in target CL clusters is realized as a glide. In works where the representation of derived CG clusters is discussed, it is assumed that they are branching onsets. The result, however, is that the only branching onsets in the child's system are CG in shape and this type of system appears to be unattested in adult grammars. In light of this, several alternative syllabifications for how the glide is syllabified are considered. All are rejected in favour of the position that the glide is not prosodically affiliated at the CG stage. Formal parallels for this type of representation in adult grammars are provided.

Key words: child phonology, rogue grammars, syllabification, branching onsets, glide substitution, variation.

Résumé

Dans cet article nous traitons de l'existence d'un stade consonne + glide lors de l'acquisition des attaques doubles, quand le glide remplace systématiquement la liquide dans les clusters consonne + liquide. Il est généralement envisagé dans la littérature que ces productions consonne + glide sont des attaques branchantes alors que de telles syllabifications ne sont attestées dans les grammaires adultes que si l'on trouve simultanément consonne + liquide en attaque branchante. D'autres possibilités de syllabification du glide sont ici discutées et l'analyse proposée est que le glide n'a pas à ce stade d'ancrage prosodique. A partir de là, nous démontrons que le type de représentation proposée a des parallèles dans les grammaires adultes.

Mots-clés: phonologie de l'enfant, grammaire déviante, syllabification, attaque branchante, substitution par glide, variation.

1. Introduction

There is a large body of evidence which reveals that children's early productions are segmentally and prosodically unmarked (e.g., Jakobson, 1941/68; Stampe, 1969; Gnanadesikan, 2004). Following from this observation, a commonly-held view has been that these unmarked patterns must reflect early grammatical organization. At the same time, however, early grammars often display patterns of behaviour which are unexpected, patterns which are, at best, rare and possibly universally illicit. The best documented case of rogue-like behaviour is place consonant harmony which is well-attested among first language learners but absent from adult grammars (Drachman, 1978; Vihman, 1978; Shaw, 1991; Hansson, 2001; see also Gafos, 1996). Although some analyses have been forwarded with the restriction to early grammars in mind (e.g., McDonough & Myers, 1991; Goad, 1997), they nevertheless predict that the same phenomenon should be attested in at least some adult systems. Other analyses which successfully limit the process to children's phonologies must accept the position that early grammars are ROGUE GRAMMARS, that is, self-contained systems either subject to their own child-specific constraints (Pater, 1997) or to a subset of the constraints available to adult grammars.

The focus of the present paper is a phenomenon which has not, to my knowledge, been discussed in the context of rogue-like behaviour: the CG STAGE in children's realization of branching onsets. After the period when consonant+liquid (CL) clusters[1] are reduced to singletons, many children learning West Germanic languages, at least, go through a stage during which the liquid in all such clusters is reportedly realized as a glide (G), e.g., target [trɪp] → [twɪp] 'trip' and [pleɪ] → [pweɪ] 'play'. In works where the representation of derived CG clusters is discussed, it is assumed that they are branching onsets (e.g., Fikkert, 1994; Barlow, 1997; Jongstra, 2003). The resulting system at the CG stage, however, is one where the only branching onsets are consonant+glide in shape and this type of system appears to be unattested in adult grammars. If the CG stage is a genuine stage in development, one must address the question of whether children's grammars are self-contained systems, or whether CGV outputs can be analysed as involving some structure other than branching onset + singleton nucleus. If the latter were possible to motivate, then for CGV behaviour, at least, children's systems would fall under the realm of POSSIBLE GRAMMARS in the sense that, at this stage in development, they would abide by the same constraints as do adult grammars (Pinker, 1984).

The empirical focus of this paper is the outputs of five children who go through the CG stage. Several alternative syllabifications for how the putative glide is syllabified are considered and rejected in favour of the position that the consonant is not prosodically affiliated at this stage in development. Formal parallels with adult grammars are drawn from floating tone analyses of downstep and consonant extraprosodicity in syllabification. In both cases, an element is present in the phonological representation but not prosodically organized.

The paper is structured as follows. In section 2, the syllabification options for CGV strings that are observed across languages are discussed, including the evidence that learners can use to select among competing representations. With these considerations in mind, data from the literature from two learners of English and two learners of Dutch who are in the CG stage in development are discussed in section 3. As will become evident, no single representation emerges as definitive and, with this, the investigation will turn, in section 4, to data from another English-speaking child whose outputs display significant variation in the realization of the derived glide. In light of this finding, in section 5, it will

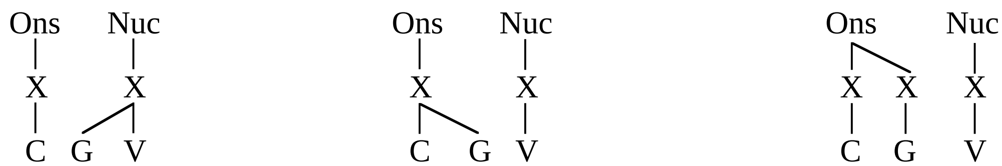
[1] In this paper, C refers to all consonants other than [s]. I take the position that sL clusters, like all sC clusters, are syllabified with an initial appendix and not as branching onsets (see Goad & Rose, 2004 for recent discussion).

be argued that the target liquid is not prosodically organized at the CG stage in development.

2. Syllabification options for CGV strings

As mentioned in the introduction, the branching onset analysis of the CG stage is problematic as the resulting system, one where the only branching onsets are CG in shape, appears to be unattested in adult grammars. In languages that permit branching onsets, CG onsets are only allowed if the language also allows the less marked CL onsets (Clements, 1990). Consistent with this, in languages that contain clusters that are CG in shape only, distributional facts reveal that the glide is part of a light (monopositional) diphthong, (1a) (see, e.g., Lee, 1998 on Korean) or represents a secondary articulation, (1b) (e.g., Clements, 1986 on Luganda). It does not form a branching onset with the preceding consonant, (1c).

(1) a. Light diphthong: b. Secondarily-artic C: c. Branching onset:



In languages where the only tautosyllabic clusters are CG in shape, distributional evidence of the following sort will be available for the learner to determine whether the representation in (1a) or (1b) is appropriate. Regarding the relationship between C and G, if there are no place or sonority restrictions between these two segments, this will indicate that a constituent boundary interrupts them, that is, that the glide is syllabified in the nucleus as in (1a). If place and/or sonority restrictions hold between C and G, this will indicate a secondary articulation analysis: concerning place, labialized labials, labialized coronals and palatalized dorsals are dispreferred (Maddieson, 1984; Ladefoged & Maddieson, 1996); concerning sonority, secondary articulations are often permitted only on stops (Maddieson, 1984). Regarding the relationship between G and V, if there are place (backness, rounding and/or height) restrictions between these two segments, this will indicate that they are syllabified as in (1a). In (1b), where a constituent boundary interrupts G and V, the glide and vowel do not typically observe place/height restrictions.[2]

As (1c) will only be permitted in languages that already require this structure for CLV strings, the child should only entertain this representation for CGV if he/she already understands how CLV is prosodified in the target language.[3] In theory, then, children learning languages which have CLV have three options to entertain for CGV strings, but if markedness guides the child's initial hypothesis in choosing among alternative representations, then one of the options in (1) may be considered by the learner first. In this context, Rose (1999) has argued that the structure in (1a) is least marked. Consequently, the English-learning child should begin with (1a) for both CwV and CjV strings. Following from this, when learners are at the stage in acquisition when liquids in clusters undergo glide substitution, non-rogue grammars could be posited – if their CGV outputs for CLV targets could be analysed as in (1a).

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[2] Note, however, that when G and V have identical place and height, the string is often illicit, regardless of the analysis of the glide: *[ji], *[wu]. This can be ruled out by an OCP constraint which is insensitive to the prosodification of the segments involved.

[3] We assume that all CLV strings are syllabified as in (1c); there are, however, some languages for which the analysis in (1a) may hold (see Kaye, 1985 on Vata).

A significant problem, however, is that the unmarked status of (1a) is uncertain. In his 1999 paper, Rose provides typological evidence to argue in favour of (1a) over (1c): in languages that permit both CLV and CGV, (1a) is more commonly the representation selected for CGV strings. As Rose acknowledges, though, frequency may not in fact correlate with unmarked status.[4] Concerning the representation in (1b), Rose argues that secondarily-articulated consonants are subject to too many restrictions to make them a likely candidate for the status of least marked. However, if the acquisition path respects the subset principle (Berwick, 1985; Wexler & Manzini, 1987), the most restrictive option should be default; the child can then be assured of having access to positive evidence to arrive at one of the other representations as appropriate. Viewed in this light, it is not obvious which of the three options in (1) is the most restrictive: (1b) and (1c) are the most restrictive in terms of the constraints imposed on the CG string, while (1a) is the most restrictive in terms of the GV string (see below for details). In short, we cannot *a priori* consider the analysis in (1a) as the solution for the CG stage in the acquisition of branching onsets.

2.1. CGV strings in English, as compared with French

In this section, we elaborate on the restrictions that hold of CGV strings under each of the representations in (1): presence or absence of place and/or sonority constraints between C and G, and presence or absence of place constraints between G and V. This will serve to highlight the types of evidence that learners must attend to in order to arrive at an appropriate representation for the CGV strings in their language and may, in turn, provide a solution for the CG stage in development. As the principal empirical focus of this paper is outputs from English-speaking children, we will concentrate on this language, providing generalizations first from French as a point of comparison.

Following most analyses of English, we will conclude that CwV and CjV require different representations, (1c) and (1a) respectively (Anderson, 1986; Giegerich, 1992; Davis & Hammond, 1995).[5] In French, most of the evidence available points toward the representation in (1a) for all CGV strings (Kaye & Lowenstamm, 1984; Hyman, 1985; Schane, 1989) (but see note 8).

2.1.1. CG place constraints

Place constraints between C and G are observed when the CG string is syllabified as a branching onset, (1c), or as a secondarily-articulated consonant, (1b). Branching onsets forbid place identity between C and G (*[pw]), parallel to what is observed with CL strings (*[tl]). Place constraints are also often observed for secondarily-articulated consonants, such that [p^w], [t^w] and [k^j] are dispreferred, as mentioned above.

In French, there are no place restrictions between C and G, in support of (1a), that is, the representation where a constituent boundary interrupts C and G, henceforth C(GV). The examples in (2a,d) show that French permits lab+lab and cor+cor CG strings, even though *[tl] is forbidden, suggesting that (1c), (CG)V, is not the correct analysis for these

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4 To provide a concrete example of a mismatch between frequency and markedness, consider CV syllables which are indisputably unmarked, but the number of languages that permit only syllables of this shape is relatively few.

5 Anderson (1986) and Giegerich (1992) actually propose a doubly-associated representation for English CjV, where the glide is a dependent in both the nucleus and the onset; see note 9 for details.

homorganic strings.[6] Against (1b), $C^G V$, (2a,c,f) indicate there are no place restrictions of the type that commonly hold for secondarily-articulated consonants. The overall profile of ticks in (2) thus leads to the light diphthong analysis for French CGV strings.

(2) French: Place constraints for C+[j ɥ w]:

	C+G	Examples	C(GV) (1a)	$C^G V$ (1b)	(CG)V (1c)
a.	lab+lab; lab+lab-cor	[pwa] 'pea' [pɥi] 'then'	✓	×	×
b.	lab+cor	[pjɛs] 'piece'	✓	✓	✓
c.	cor+lab	[twa] 'you'	✓	×	✓
d.	cor+cor; cor+lab-cor	[tjɛ̃] 'hold-SG' [tɥe] 'to kill'	✓	✓	×
e.	vel+lab	[kwa] 'what'	✓	✓	✓
f.	vel+cor	[kjɛ] 'calm'	✓	×	✓

In some dialects of English, the two glides differ in the place constraints observed to hold between C and G. The profile of tick marks in (3a) reveals that Cw patterns like a true branching onset. Cj in (3b), by contrast, patterns like CG in French in most British dialects. In most American dialects, the absence of cor+cor suggests that, from the point of view of place constraints, CjV looks like a branching onset.[7]

(3) a. English: Place constraints for C+[w]:

C+G	Examples	C(GV) (1a)	$C^G V$ (1b)	(CG)V (1c)
lab+lab	*	×	✓	✓
cor+lab	[twɪn] 'twin'	✓	×	✓
vel+lab	[kwiːn] 'queen'	✓	✓	✓

b. English: Place constraints for C+[j]:

C+G	Examples	C(GV) (1a)	$C^G V$ (1b)	(CG)V (1c)
lab+cor	[pjuː] 'pew'	✓	✓	✓
cor+cor (Brit)	[tjuːn] 'tune'	✓	✓	×
cor+cor (Amer)	*	×	✓	✓
vel+cor	[kjuːt] 'cute'	✓	×	✓

2.1.2. CG sonority constraints

Sonority constraints are observed to hold between C and G when the string is syllabified as a branching onset, (CG)V, or as a secondarily-articulated consonant, $C^G V$. In

[6] A tick marks the optimal analysis for a given string of segments. Crosses indicate dispreferred analyses but these analyses are not necessarily illicit when viewed in a broader context. Thus, it is the overall profile of ticks that will lead to the appropriate analysis.

[7] As will be seen, other constraints suggest that [j] is syllabified in the nucleus (but see note 9). This will require the absence of cor+[j] in American English to be due to an OCP constraint which is insensitive to structure, like *[ji], *[wu] in note 2.

the former case, C must be an obstruent; in the latter, C prefers to be a stop. No such constraints hold when a constituent boundary interrupts C and G, that is, in the C(GV) representation in (1a).

In French, the apparent absence of sonority constraints in (4) points toward the light diphthong analysis in (1a).[8]

(4) French: Sonority constraints for C+[j ɥ w]:

C+G	Examples	C(GV) (1a)	C^{G}V (1b)	(CG)V (1c)
stop+glide	[pjɛs] ‘piece’	✓	✓	✓
	[pɥi] ‘then’	✓	✓	✓
	[pwal] ‘stove’	✓	✓	✓
fric+glide	[fjɛr] ‘proud’	✓	×	✓
	[fɥir] ‘to shun’	✓	×	✓
	[fwa] ‘time’	✓	×	✓
son+glide	[mjø] ‘better’	✓	×	×
	[mɥɛ] ‘mute’	✓	×	×
	[mwa] ‘month’	✓	×	×

In English, by contrast, the C preceding [w] cannot be a sonorant, (5a), suggesting that C and [w] are internal to the same constituent, unlike in (1a). Among obstruents, fricatives rarely permit secondary articulations, suggesting that the branching onset analysis, (1c), is correct. Note, however, that fricative + [w] is rare (for fricatives other than [s]; see note 1). Thus, the child may be led to conclude that the correct analysis is instead that in (1b), hence the question mark in the relevant cell in (5a). Turning to Cj in (5b), C can be a sonorant, suggesting that the analysis is that in (1a), as in French.[9]

[8] This is somewhat of a simplification, as [j] does not exhibit exactly the same behaviour as [w] and [ɥ] on the sonority dimension (see Martinet (1933) and Klein (1991, 1993) for detailed discussion of differences among the three glides in French). Some speakers do not allow [j] after high sonority onsets (e.g., *lion* ‘lion’ is [lijɔ̃] rather than [ljɔ̃]; cf. *loi* ‘law’ which is parsed as [lwa], not as *[luwa]; and *lui* ‘him’ which is parsed as [lɥi], not as *[lyɥi]). In combination with the fact that speakers do not permit [j] after branching onsets (e.g., *trier* ‘to sort (out)’ is [trije], not *[trje]; cf. *trois* ‘three’ which is parsed as [trwɑ], not as *[truwɑ]; and *truite* ‘trout’ which is parsed as [trɥit], not as *[tryɥit]), [j] in French shows some behaviour indicative of an analysis along the lines of (1c). However, the overall profile for [j] is more consistent with the analysis in (1a) and, thus, this is the position that will be taken in this paper. Aside from the place facts in (2) and (6), the presence of [j] after nasals in (4) is not consistent with the branching onset analysis in (1a): nasal-initial clusters are overwhelmingly (perhaps universally) absent from languages in which such clusters would be analysed as branching onsets. Indeed, words like [mjø] ‘better’ will provide positive evidence for the learner against the branching onset analysis. Thanks to Sophie Wauquier-Gravelines and Joaquim Brandao de Carvalho for drawing the facts on French [j] to my attention.

[9] As mentioned in note 5, Anderson (1986) and Giegerich (1992) propose that [j] in English CjV is syllabified in both the nucleus and the onset. This is in part because [j] cannot freely occur after high sonority onsets (cf. note 8 on French): ‘lewd’ is commonly [luːd] instead of the expected [ljuːd] and ‘rude’ is virtually never realized as [rjuːd]. However, as in French, the presence of [j] after nasals is not consistent with the branching onset part of the representation, which is why I have not opted for double association of the glide. See section 3.3 for further discussion of the doubly-associated approach.

(5) a. English: Sonority constraints for C+[w]:

C+G	Examples	C(GV) (1a)	$C^{G}V$ (1b)	(CG)V (1c)
stop+glide	[twɪn] ‘twin’	✓	✓	✓
fric+glide	[θwæk] ‘thwack’	✓	✗?	✓
son+glide	*	✗	✓	✓

b. English: Sonority constraints for C+[j]:

C+G	Examples	C(GV) (1a)	$C^{G}V$ (1b)	(CG)V (1c)
stop+glide	[pjuː] ‘pew’	✓	✓	✓
fric+glide	[fjuː] ‘few’	✓	✗	✓
son+glide	[mjuːz] ‘muse’	✓	✗	✗

2.1.3. GV place constraints

Turning finally to place constraints that may hold between G and V, constraints of this sort are observed when G and V are constituent-internal, as in the representation in (1a). The data in (6) show that in French, each of the glides enters into place constraints with the following vowel on the height and/or rounding dimensions.

(6) French: Place constraints for [j ɥ w]+V:

	G+V	Examples	C(GV) (1a)	$C^{G}V$ (1b)	(CG)V (1c)
a.	[j]+non-high V	[pjɛs] ‘piece’	✓	✗	✗
	[j]+high V	*			
b.	[ɥ]+unround V	[pɥi] ‘then’	✓	✗	✗
	[ɥ]+round V	*			
c.	[w]+unround V	[pwɑl] ‘stove’	✓	✗	✗
	[w]+round V	*			

In English, (7a) reveals that [w] is not similarly constrained (aside from *[wu]; see note 2), as expected under either of the representations in (1b) or (1c). The vowel that can follow [j], however, is severely restricted, consistent with the analysis in (1a); see (7b).

(7) a. English: Place constraints for [w]+V:

G+V	Examples	C(GV) (1a)	$C^{G}V$ (1b)	(CG)V (1c)
[w]+front V	[kwɛnt͡ʃ] ‘quench’	✗	✓	✓
[w]+high back V	*			
[w]+mid back V	[kwout] ‘quote’			
[w]+low V	[kwɑlɪfai] ‘qualify’			

b. English: Place constraints for [j]+V:

G+V	Examples		C(GV) (1a)	C^{G}V (1b)	(CG)V (1c)
[j]+[uː]	[kjuːt]	'cute'	✓	×	×
[j]+[ʊə/ɚ]	[kjʊə] (Brit), [kjɚ] (Amer)	'cure'			
[j]+other V	*				

2.1.4. Summary

In sum, while we have seen that, in French, most evidence from place and sonority constraints on CGV sequences points toward a light diphthong analysis for CGV, the summary in (8) highlights the fact that the evidence is less straightforward for English. Not only are different representations required for CwV and CjV, branching onset and light diphthong respectively, but there are unexpected gaps in the distribution of both CGV strings.

(8) Summary for English:

	CwV	CjV
CG Place	(1c)	(1a) (Brit), (1c) (Amer)
CG Sonority	(1c)?	(1a)
GV Place	(1b) or (1c)	(1a)
Analysis	~(1c)	(1a)

In spite of the challenge that this presents for the English learner, the range of possible options may, in fact, provide a solution for the CG stage in development. For instance, if the child has arrived at the appropriate representation for CjV, he/she may use this representation for target CLV during the stage when CLV surfaces as CGV. Alternatively, if the evidence internalized by the learner for CwV has led him/her to pose a secondarily-articulation analysis for G, then CGV which arises from target CLV may be analysed as C^{G}V. Under either scenario, the CG stage in development would not involve a branching onset analysis, providing a solution to the rogue grammar that would otherwise result. In light of this, we turn now to examine data from children who are in the CG stage.

3. The CG stage in development

3.1. English

The data in (9) illustrate how target CL clusters are realized as CG in the outputs of two learners of American English, Jake and Kylie. At the point in time illustrated, age 2,1 and 2,0 respectively, both children also realize some CL clusters as C; that is, the developmentally-earlier cluster reduction stage and the glide substitution stage overlap to some extent. From the data available for Jake, the predominant pattern for both Cr and Cl targets is for the cluster to surface as Cw (100% and 64% respectively); Kylie displays both glide substitution and liquid deletion for Cr targets (33% and 67% respectively) although liquid deletion is dominant for Cl (84% surface as C). Importantly, although cluster reduction is commonly attested in the outputs of both children, when target CL surfaces as a cluster, the liquid is always realized as a glide.

(9) a. Jake at 2,1 (Bleile 1991: 66-67):

Target cluster	Child output	Gloss
lab+[r]	[bweɪk] [fwɛnz] [bwoʊn] [fwɔg] [fwʌnt]	‘break’ ‘friends’ ‘brown’ ‘frog’ ‘front’
cor+[r]	[twi] [stwɛt͡ʃ] [twækʊ] [twaɪ.æŋgʊ] [stwɔbnwiz]	‘tree’ ‘stretch’ ‘tractor’ ‘triangle’ ‘strawberries’
dor+[r]	[gwin] [kwɪstəfu] [gweɪps] [gwæmpa] [kwaɪ] [kwɔs]	‘green’ ‘Cristopher’ ‘grapes’ ‘grandpa’ ‘cry’ ‘cross’ (N)
lab+[l]	[pwiz] [pweɪt] [bwæk]	‘please’ ‘plate’ ‘black’
dor+[l]	[sʌŋgwæsɪz] [kwoʊz] [kwɑziʔ]	‘sunglasses’ ‘close’ ‘closet’

b. Kylie at 2,0 (Bleile 1991: 61-62):

Target cluster	Child output	Gloss
lab+[r]	[spwiŋ] [bwɛ]	‘spring’ ‘bread’
cor+[r]	[bwi]	‘tree’
dor+[r]	[kwim] [bwæs]	‘cream’ ‘grass’
lab+[l]	[oʊpweɪn]	‘airplane’

Before we can turn to the representation of these derived CG clusters, one explanation for glide substitution must be ruled out: perceptual miscoding. To address this question, we begin with the observation that, for both Jake and Kylie, the glide that substitutes for target [r] and [l] is always [w]. Concerning Cr, as [r] is labialized in English, this could reflect perceptual confusion between these two sounds, that is, that target Cr is misperceived as Cw and that there is no glide substitution per se with Cr clusters. Some evidence consistent with the misperception analysis is as follows: (i) both children treat target Cw in the same fashion as Cr (although the number of examples of Cw is low); (ii) Kylie typically spreads labiality from both [r] and [w] onto the preceding consonant (e.g., target [græs] → [bwæs] ‘grass’ and [kwiːn] → [bwi] ‘queen’); and (iii) both children produce target [r] as [w] in singleton onsets.

Although [w] substitution may reflect a perceptual problem for [r], a scenario along these lines is much less easy to motivate for Cl → Cw: (i) onset [l] is neither labialized nor velarized in Iowa City English, the dialect spoken by the two children (Bleile, p.c.), making it perceptually further from [w] than is [r]; and (ii) the two children have different glide substitutes for singleton onset [l] ([l] → [w] for Jake and [l] → [j] for Kylie). In short, it would appear that Cl is indeed perceived with a liquid, not a glide, in the dependent position of the cluster. Thus, at this point in their development, Jake and Kylie are likely assuming that the inventory of branching onsets in the target grammar is either Cl-Cr-Cw or Cl-Cw[10]; under either scenario, the resulting system is one where both liquids and glides are licit as dependents in branching onsets. Their surface system, however, is one where target branching onsets are limited to CG. This is exactly the rogue system described earlier – if these clusters are organized as branching onsets in the children's outputs. With the types of restrictions introduced in section 2 in mind, could these strings be analysed either with the glide in the nucleus or as a secondary articulation? We will return to this question in section 3.3.

3.2. Dutch

In (10), data are provided from two learners of Dutch, Catootje and Elke, who are also in the CG stage. These data form an interesting comparison with the English data in (9) for two reasons. (i) [r] in Dutch is not labialized as it is in English and the glide that corresponds to English [w] is labio-dental [ʋ]; thus, the possibility of perceptual confusion between the rhotic and the glide is minimized. (ii) Both Catootje and Elke productively produce singleton onset liquids as target-like during the CG stage, unlike the English children in (9)[11]; this suggests that the glide substitution observed in (10) is indeed due to the position of the target liquid and not due to articulatory difficulties with [r] and [l].

(10) a. Catootje at 1,11.9-2,0.20 (Fikkert 1994: 75):

Target cluster	Target output	Child output	Gloss
cor+[r]	[trɛin] [trœy] [draːk]	[tjeːn] [tjœy] [djaːk]	'train' 'jumper' 'dragon'
dor+[r]	[ˈkrɛi͡tjə] [krɑnt]	[ˈkjɛitə] [kjɑnt]	'chalk' 'newspaper'
lab+[l]	[χəˈplɑkt]	[pjaːkt]	'stuck'
dor+[l]	[klɛin]	[kjɛin]	'small'

b. Elke at 2,0.11-2,2.6 (Fikkert 1994: 76):

Target cluster	Target output	Child output	Gloss
cor+[r]	[ˈdrɪŋkə(n)] [ˈdraːjə(n)]	[ˈtjɪnɪ] [tjaːn]	'to drink' 'to turn'
dor+[l]	[klɔk]	[kʋɔk]	'clock'

To account for the developmental stage in (10), Fikkert (1994) proposes that CG is the preferred output for CL because of sonority considerations. Specifically, the difference between success with liquids in singleton onsets and failure in clusters is attributed to the child striving to maximize the sonority distance between the two members of a branching

[10] Both children have outputs for *music* and, thus, I am assuming that they have recognized that the presence of [j] after nasals indicates that Cj is not a branching onset in English. See Smith (1973: 73) and Barlow (1996) for evidence of differences in the patterning of CjV and CwV in other English-speaking children.

[11] Jake has no instances of output [r] or [l]. While Kylie has a few instances of [l], this is not her preferred surface form for target [l] at this stage.

onset. The problem with this approach is that it leaves unexplained the children’s treatment of target stop+[ʋ] clusters. Clusters of this shape were avoided until 2,0.6 for Catootje and until 2,4.29 for Elke and, for both children, when they are attempted at these ages, they are reduced to singleton stops. The result for Elke is that target [kl] → [kʋ] at the same point in time when target [kʋ] → [k]. It appears, then, that these children have not assigned the same representation to CG targets as they have to their CG outputs for CL targets.

How, then, are these derived CG clusters represented? Before we can begin to address this question, some discussion of the representation of Dutch target CG strings is in order. Aside from a few loanwords with [j], the glide in clusters is restricted to [ʋ]. While Cʋ is often considered to be a branching onset, it looks more like a secondarily-articulated consonant in that C must be a stop: only [tʋ], [dʋ] and [kʋ] are attested; although Dutch permits [χl] and [χr], *[χʋ] is illicit.[12]

If the child has concluded that target Cʋ is represented as a secondarily-articulated consonant, and if derived CG does not pattern with target Cʋ, then derived CG must be represented in some way other than as a secondarily-articulated consonant. If derived CG is instead organized like target CL in Dutch, as a branching onset, the result for the child is a rogue grammar. The remaining option is for the glide to be located in the nucleus.

In sum, we have seen that for the two English learners, a rogue grammar can be avoided if derived CG strings are represented with the glide either as a secondary articulation or as part of a light diphthong. For the two Dutch learners, the only option available is for the glide to be present in the nucleus. With these options in mind, we will turn to examine the constraints that hold for derived CGV strings in the four children’s outputs, in so far as we can from the data available.

3.3. Searching for an analysis of the CG stage

In (11), the three analyses for CGV strings are compared along the various dimensions discussed in section 2.1. Recall that (1a) is the light diphthong analysis, C(GV), (1b) is the secondary-articulation analysis, C^GV, and (1c) is the branching onset analysis, (CG)V.

(11) Analysis options for derived CG outputs:

	Jake			Kylie			Catootje			Elke		
a. CW targets pattern with CL targets	yes			yes			No			no		
	×(1a)	✓(1b)	✓(1c)	×(1a)	✓(1b)	✓(1c)	✓(1a)	×(1b)	✓(1c)	✓(1a)	×(1b)	✓(1c)
b. Pl constraints for C+G	no			no			No			no?		
	✓(1a)	×(1b)	×(1c)	✓(1a)	×(1b)	×(1c)	✓(1a)	×(1b)	×(1c)	✓(1a)	?(1b)	×(1c)
c. Sonority constraints for C+G	no			yes			?			yes		
	✓(1a)	×(1b)	?(1c)	×(1a)	✓(1b)	×(1c)	×(1a)			×(1a)	✓(1b)	×(1c)
d. Pl constraints for G+V	no			yes			no			no		
	×(1a)	✓(1b)	✓(1c)	✓(1a)	×(1b)	×(1c)	×(1a)	✓(1b)	✓(1c)	×(1a)	✓(1b)	✓(1c)
e. Child analysis of derived CG	(1c) or no clear winner			(1a) or (1b)			(1a) or (1c)			(1b) or no clear winner		
f. Adult analysis of CL	(1c)						(1c)					
g. Adult analysis of CW	(1b) or (1c)						(1b)					
h. Adult analysis of Cj	(1a)						—					

12 Dutch does permit [zʋ], but [z] in this context is an appendix (see note 1).

The concern of (11a) is whether or not, for each child, CW targets (i.e., English Cw and Dutch Cʋ) pattern with CL targets, since the latter surface as CG; « pattern » refers to whether these two strings of segments, target CL and target CW, display the same behaviour at a given point in time: deletion of the approximant and/or realization of the approximant as a glide. For the English children, Cw targets pattern as do CL targets, suggesting that they have the same representation. As we have seen, the two possible structures that the child could entertain for target Cw are the secondarily articulation and branching onset analyses, (1b) and (1c), hence the profile of tick marks in (11a). For the Dutch children, we observed immediately above that target Cʋ does not pattern with CW derived from CL, suggesting that they have different representations. If the child has concluded that (1b) is the adult representation for target Cʋ (see (11g)), then the remaining options for derived CW are the light diphthong and branching onset analyses, (1a) and (1c).

As is evident from (11b), none of the children appears to display place constraints for the derived CG strings, supporting the light diphthong analysis in (1a). Concerning the secondarily-articulation option in (1b), Jake, Kylie and Catootje all permit one or more of the cross-linguistically dispreferred sequences: [p^w], [t^w], [k^j]. Elke does not, but the number of datapoints for her is quite limited, hence the question mark in the relevant cell. Concerning the branching onset option in (1c), all of the children permit clusters with identical place, either lab+[w] (Jake, Kylie) or cor+[j] (Catootje, Elke).

Turning to sonority constraints between C and G, (11c), only Jake is unconstrained. The C in derived CG can either be a stop or a fricative, exactly what the target language permits for branching onsets, but it can also be a nasal as in the following example: [stwɔbnwiz] 'strawberries'. This is consistent with the light diphthong analysis in (1a). However, as we do not know how representative this form is of Jake's overall grammar, to be conservative, (1c) will not be ruled out as an option but will be marked with a question mark. The grammars of the other three children are more restrictive in allowing only stops in C position. Kylie and Elke reduce all fricative+liquid clusters to the fricative, rather than allowing these to surface as fricative+glide; this is consistent with a secondary articulation analysis. Catootje reduces such clusters either to [h] (her substitute for fricatives) or to the liquid. If [h] does not have the distinguishing features of fricatives ([-son, +cont]), then the fact that the C in CG clusters must be a stop cannot be deemed as a restriction per se; her system is simply one which forbids fricatives at this point in development. Thus, no conclusions can be drawn from the sonority dimension, other than to rule out (1a).

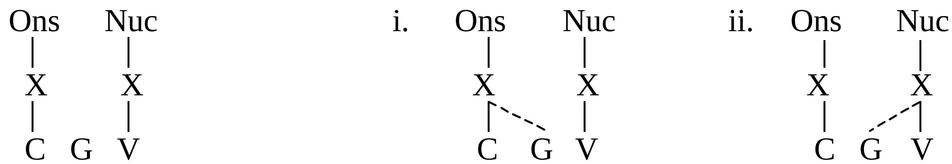
Finally, concerning restrictions that may hold of the GV sequence, (11d), only Kylie's grammar observes constraints: the [w] in derived CG strings can only be followed by a front vowel. This is consistent with a light diphthong analysis for this child, and with any other analysis for the remaining children.

When we view the profile of ticks in (11), it is evident that no single analysis emerges across children nor even for a single child; see (11e). The branching onset analysis, (1c), may be preferred by Jake and/or Catootje, but then their grammars would be characterized as rogue grammars, not only because the branching onsets would be limited to CG but also because these branching onsets would permit place identity, (11b). Of the English children, only Kylie fits the prediction of opting for the light diphthong or secondary articulation analysis, (1a) or (1b); while each of these is (possibly) permitted by the target grammar, for Cj and Cw respectively (see (11g-h)), both options appear to be equally favoured (or disfavoured) by her for derived Cw, a problem which we return to below. Catootje may also opt for (1a), although as this representation is not permitted anywhere in the target grammar (see (11f-h)), this solution would require unlearning at some later stage in development. Finally, while Elke may opt for (1b), this is not consistent with the observation that her target Cʋ clusters are reduced at the same point when her CL clusters surface as CG, (11a).

Could the murky situation in (11e) indicate that a given child is equivocating between two or more representations? This is perhaps easiest to imagine for a child like Kylie whose grammar appears to permit either (1a) or (1b). In an approach which assumes that (prosodic) representations are highly-articulated, as is the case here, the only difference between these two structures is whether the root node/features of the glide are affiliated with the X slot of the onset consonant or with the X slot of the following vowel. This is derivationally expressed in (12) for illustrative purposes:

(12) Two representations:

a. Core syllable: b. Affiliation of the glide:

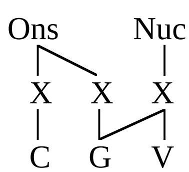


It is unlikely that this type of approach is correct, as it requires both of the representations in (12b) for derived CGV clusters to be permitted by the child's grammar at once. Although either (12b.i) or (12b.ii) will presumably be selected under different circumstances (e.g., depending on the place/sonority profile of the preceding consonant), in many cases, there will be ambiguity about which representation should be selected and the result will be a type of complexity that is not needed – nor permitted – in adult grammars.[13]

One scenario under which a two representation approach like that in (12) could be motivated is for children whose outputs clearly display evidence of overlapping stages in development. For example, for derived CGV, the child postulates (12b.i) at stage n and (12b.ii) at stage n+1, and what we are observing at the point in time under focus is outputs that reflect the transition from stage n to n+1. For the children in (11), however, there is no clear evidence for an analysis involving overlapping stages of this sort and so imposing such a solution would likely be spurious.

Another option to consider is that the inconclusive situation observed in (11e) indicates that one or more of the children has a doubly-associated representation for the glide in derived CGV strings. Recall in this context that Anderson (1986) and Giegerich (1992) propose this solution for CjV in English: the glide is simultaneously syllabified as part of a branching onset and as part of a light diphthong; see (13):

(13) Doubly-associated representation:



This option could hold for Catootje; recall from (11e) that we could not conclusively determine whether her grammar had selected (1a) or (1c) for derived CGV strings.

In recent work on the development of CGV and CLV strings in French, Kehoe & Hilaire-Debove (2004) propose a doubly-associated representation along the lines of that in (13) for approximants in both types of strings (see Klein (1991, 1993) on this type of representation for glides in adult French). This is because the children in their study displayed no robust differences in their acquisition of CLV and CGV. Kehoe & Hilaire-Debove propose (13) as a compromise representation, because it shares properties with both the target branching onset and light diphthong representations.

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[13] There are, of course, languages where different analyses are required for segments that *a priori* look like they belong to the same class, e.g., the glides in English CjV versus CwV; in this case, however, there is no ambiguity about which representation is to be selected under which circumstances.

Is the postulation of a doubly-associated representation like (13) an appropriate solution for the ambiguity displayed by the children under focus? One problem is that this type of representation is highly marked; therefore, it should not be considered by the learner, unless there is robust evidence in the ambient language for it. While English arguably has evidence consistent with (13) for CjV (see note 9), there is no evidence in Dutch for Catootje to posit such a representation. A second problem is that while double association has been proposed to handle segments which display conflicting behaviour under different syllabifications, if the affected segment is represented in this way, it should instead respect all appropriate constraints required for affiliation with the preceding consonant and with the following vowel, leading to unresolvable conflicts that would not have arisen under either of the component syllabifications, branching onset and light diphthong respectively. In short, multiple association does not appear to be a suitable solution for the problem at hand.

3.4. (Co-)articulatory properties observed over CGV strings in adult grammars

We appear to have exhausted all of the possibilities available concerning the representation of derived CG clusters. However, one factor that has been left out of the discussion thus far is variation in the child's articulation of the glide or, more precisely, variation in the (co-)articulatory properties observed over the entire CGV string: does the glide bear the same relationship to the preceding consonant and following vowel in all of the child's outputs at a given stage in development?

To discern the range of options that may be possible, in this section, we briefly describe the different phonetic effects that are evident in adult CGV strings, depending on whether the glide is syllabified as a secondary articulation, $C^{G}V$, as part of a branching onset, (CG)V, or as part of a light diphthong, C(GV). The discussion will concentrate primarily on distinguishing $C^{G}V$ from (CG)V, and (CG)V from C(GV).

(i) Timing in $C^{G}V$ versus (CG)V: In (CG)V, as well as in C(GV), the C and G articulations are sequenced, whereas in secondarily-articulated consonants, C and G are virtually simultaneous. As a result, in $C^{G}V$, the transition from the glide into the vowel begins at the point when C is released (Ladefoged & Maddieson, 1996).

(ii) Overlapping articulation in $C^{G}V$ versus (CG)V: Overlapping articulation effects are more robust when C and G are closest, that is, internal to the same segment, or failing this, internal to the same syllable constituent. Focussing on CwV, lip rounding on C is greatest for $C^{w}V$, as C and [w] form a single complex segment. Although labiality (as well as palatality) tends to be strongest at the release of C, the secondary articulation extends virtually throughout the duration of C (Ladefoged & Maddieson, 1996). By contrast, in (Cw)V, stops in C position are only « slightly rounded » (Ladefoged, 2001: 55). Lip rounding is least for $C(wV)_{Nuc}$ since C and [w] cross a syllable constituent.

(iii) Duration in (CG)V versus C(GV): Nuclear G (as in C(GV)) is greater in duration than onset G (as in (CG)V). A non-nuclear glide is an extremely short vowel which is characterized either by an approach phase (on-glide) or by a release phase (off-glide) (Catford, 1988). In (CG)V, G only has a release phase. Vowels, by contrast, additionally contain a hold phase, during which the articulators are held in position for some period of time (Catford, 1988). In C(GV), G is a vowel and thus contains a hold phase in addition to approach and releases phases.

(iv) Constriction of the vocal tract in (CG)V versus C(GV): Non-nuclear G is produced with greater constriction of the vocal tract than nuclear G, drawing on the well-motivated difference in the articulation of glides and vowels (see Ladefoged & Maddieson, 1996).

For the four children we have discussed thus far, the broad transcriptions available transcribe the outputs consistently as CGV. However, it may be that narrower transcriptions would reveal that the glide is sometimes more closely bound to the preceding consonant and at other times to the following vowel, specifically, that differences along the lines of those outlined in (i) to (iv) above are detectable. The inability to come up with a unique representation of derived CGV for each of the children discussed suggests that variation of this sort may be evident.

In the following section, we will see that variation in derived CGV outputs is indeed present in the narrowly-transcribed forms from an English-speaking child, Richard. These data were collected on a near-daily basis, which, of course, enhances the possibility of observing variation in his outputs.

4. Diary study

Diary data were collected from Richard (pseudonym), a monolingual speaker of Canadian English, from his first words until about age three. Data were collected on a near-daily basis by his mother, a linguist with extensive training in sound discrimination and transcription. The data were narrowly transcribed immediately upon production by the child. Any sounds for which the mother was unsure of the transcription were noted.

After an initial period during which CLV targets were reduced to C, Richard went through an extended CGV stage. Other patterns that were attested during this stage are as follows: (i) liquid deletion was still very common; (ii) liquids were occasionally augmented to full vowels (always [u]), yielding bisyllabic outputs (e.g., [gu.iːn] ‘green’)[14]; (iii) some CL forms triggered epenthesis, typically of an extremely short vowel (e.g., [tʰúˑ kᵊlɑ̀tʰ] ‘two clocks’, [dᶶɾ̭ɑː] ‘draw’); (iv) some forms, especially [tr] targets, underwent fusion of C and L (e.g., [t͡ʃɛː] ‘trailer’, [βɛ̝̃n] ‘bring’)[15]; and (v) the odd form was produced in target-like fashion.

The present discussion focusses on Richard’s outputs for CLV targets for one month at age 2,5.[16] The table in (14a) shows the number of attempted CLV targets for each cluster type at this age. (14b) indicates the number of these under discussion. Specifically, 54/96 CrV targets and 34/68 ClV targets are produced as CGV, that is, excluding the other types of outputs for CLV mentioned in the previous paragraph.

(14) a. Number of attempted CLV targets:

Fric+r		Stop+r						Fric+l	Stop+l			
fr	θr	pr	br	tr	dr	kr	gr	fl	pl	bl	kl	gl
3	7	4	11	45	11	6	9	1	19	16	31	1
96								68				

b. Number of CLV targets produced as CGV:

Fric+r		Stop+r						Fric+l	Stop+l			
fr	θr	pr	br	tr	dr	kr	gr	fl	pl	bl	kl	gl
0	4	1	6	32	2	5	4	0	6	5	22	1
54								34				

---

14 Note that vowel nasalization was not reliably transcribed by the mother; ‘green’, as well as the VN forms in (15) and (16) below, may have had nasalized vowels.

15 Concerning Richard’s output for ‘trailer’, note that assimilation of [t] to [r] yielding [t͡ʃr] is not a property of his parents’ dialect.

16 There were nine recorded CwV attempts (all target [kw]) during this period; they display the same range of options as CLV, suggesting that the approximant is organized in the same fashion in target CLV as in target CwV. There were no recorded CjV attempts during this month, but from 1,10.19 to 2,9.25, deletion of [j] was overwhelming observed, suggesting that Richard recognizes that CjV is organized differently from CwV in English.

When we look more closely at the shape of the glide in the 88 CGV outputs in (14b), it becomes evident that G is realized variably, along the lines of what was discussed in section 3.4 for the three different syllabifications of CGV strings observed across languages. The tables in (15) and (16) display the various types of outputs attested, ranging from those in the first column where the target liquid is produced in ways which suggest that it is closely bound to the initial C (parallel to CᴳV) through to outputs in the third column where the liquid is closely bound to V (parallel to C(GV)). (Numbers in parentheses indicate the number of tokens which display a given pattern; representative examples are also provided.)

(15) Outputs for [r] in CLV targets:

Target [r] bound to initial C (12)	Target [r] sequenced between C and V (31)	Target [r] bound to following V (11)
secondary [w], audible on release (CʷV) [t͡ʃʷʌk] ‘truck’ (8)	labio-rhotic glide (Cr̯V) [dr̯aiy̹] ‘drive’ (26)	labio-velar vocalic segment (Cu̯V) [gu̯əɪpʰ] ‘grape’ (11)
secondary [w], audible throughout C (C̫V) [β̫ʌk] ‘truck’ (3)	labio-velar glide (CwV) [kʰwẽĩn] ‘crane’ (4)	
secondary [β], audible on release (CᵝV) [bᵝɑkʰ] ‘broke’ (1)	labial approximant (CβV) [bβɑkʰ] ‘broke’ (1)	

(16) Outputs for [l] in CLV targets:

Target [l] bound to initial C (4)	Target [l] sequenced between C and V (6)	Target [l] bound to following V (24)
secondary [w], audible on release (CʷV) [bʷúˑ wʌ̀n] ‘blue one’ (3)	labio-velar glide (CwV) [dwɑ] ‘draw’ (3)	labio-velar vocalic segment (Cu̯V) [pʰu̯ɑp] ‘plop’ (19)
secondary [ʉ]-glide, audible on release (CᶶV) [kᶶoʊz] ‘close’ (1)	labio-rhotic glide (Cr̯V) [br̯ǽk̚ kʰæ̀t̚] ‘black cat’ (2)	labio-palatal vocalic segment (Cy̯V) [ky̯iˑn] ‘clean’ (5)
	lateral glide (Cl̯V) [kʰl̯ɛnt̚] ‘Kl̂ent’ (name) (1)	

Taking the CrV and ClV targets together, 16/88 (18%) involve outputs where the glide is closely bound to the preceding C (first column). The realization of the glide is typically as secondary labio-velarity (11/16 cases), audible on release of the consonant (CʷV); in some cases, labiality is audible throughout the articulation of the consonant (C̫V), and in others, labiality occurs without a simultaneous velar articulation, with greater (CᵝV) or lesser (CᶶV) degree of constriction.

Turning to the second column, 37/88 (42%) of cases of target CLV involve outputs where the glide is sequenced between C and V, much like in a branching onset. The glide is typically realized with some rhotic quality (Cr̯V), in 28/37 cases, but [r̯] is even more glide-like than English target [r]. There are only a handful of cases of a true labio-velar glide, CwV (7/37).

Considering finally the last column, 35/88 (40%) of cases involve outputs where the glide is closely bound to the following vowel, that is, where it involves less constriction and is of greater duration than non-nuclear [w]. Most cases involve a labio-velar vocalic segment (Cu̯V); labio-palatal examples (Cy̯V) only occur before front vowels.

In sum, the degree of variation observed in the articulation of G in derived CGV strings is very high; two patterns, Cu̯V and Cr̯V, are quite robustly attested, 34% and 32% of the time respectively, while the next most common pattern, $C^{w}V$, occurs 13% of the time. The fact that the three best attested patterns would each likely map onto a different syllabification for G – C(GV) for Cu̯V, (CG)V for Cr̯V, and $C^{G}V$ for $C^{w}V$ – is consistent with the findings for the other four children, namely that no single analysis for derived CGV emerged as optimal. In the next section, we propose a solution to this conundrum.

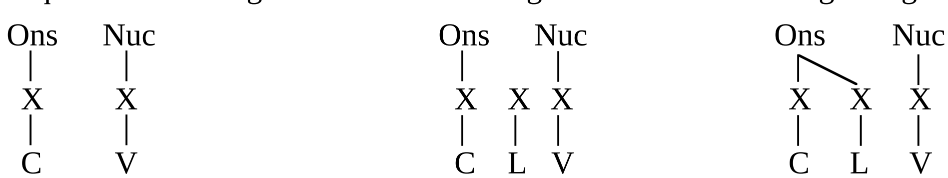
5. Proposal

In section 3.3, we rejected the proposal that the inability to arrive at a single analysis for the CG stage for any of the four children discussed indicated that the grammars of these children permit either more than one syllabication option for derived CGV or a doubly-associated representation. Instead, with the variation data from Richard in mind, the proposal that we forward here is that the X slot dominating the features of the target liquid is not prosodified in outputs at this stage in acquisition. That is, the developing grammar has not yet arrived at a ranking which will yield, for example, a branching onset analysis of the target string. The most important empirical effect is that without the X slot being anchored into the prosodic representation, the features of the target liquid are free to be phonetically more or less bound to either of the adjacent segments, depending on factors such as featural compatibility and rate of speech; this, in turn, will affect which features of the target liquid will be perceptible in the child's productions. In short, the phonological grammar does not indicate whether the features of the liquid 'prefer' the preceding consonant or the following vowel; this is the role of the phonetic interpretation component. The grammar only provides the window in which the liquid can be realized: it is bound on the left by the prosodically-anchored C and on the right by the prosodically-anchored V.

The structures in (17) illustrate the output of the phonological grammar for three stages in development: the liquid deletion stage (17a), the CG stage under focus (17b), and the target grammar stage (17c).

(17) Outputs of the phonological grammar:

a. Liquid deletion stage: b. CG stage: c. Target stage:



The CG stage is characterized by a grammar which respects segmental faithfulness (MAX), unlike the previous liquid deletion stage, but does not yet permit the prosodic complexity required by the adult grammar (it satisfies *COMPLEX(Ons)). While this may seem like a logical intermediate step in development, the question that immediately arises is whether a representation like that in (17b) is indeed licit. If there is no adult parallel for such a representation, we have returned to the problem that we started with, namely that early grammars would be charaterized as rogue grammars.

There is a solution to this problem, as there are (at least) two precedents in the literature for representations along the lines of (17b). The first is floating tone analyses of downstep. Downstep refers to the phenomenon where a low tone, which is not phonetically realized in outputs, causes a following high tone to lower. For example, the high tone on the penultimate syllable in the Venda form for ‘at the river’ in (18) surfaces as lowered (indicated by ꜜ), due to a low tone which was forced to delink from the preceding syllable (example from Kenstowicz, 1994).[17]

(18) mu-lam bo ni → [mú-lámbꜜónì] ‘at the river’

H L H L

The second precendent for unassociated material in output representations comes from the literature on extraprosodicity: segments which do not behave as if they are organized by the prosodic constituent which, by virtue of their position in the string, would normally organize them, can be licensed by extraprosodicity and thereby escape deletion (see esp. Itô, 1986). In Yapese, for example, there are no word-internal codas; words, however, must end in a consonant (Jensen, 1977). If word-final consonants were codas in this language, the absence of word-internal codas would be unexpected. Accordingly, right-edge consonants have been proposed to have extraprosodic status in this language (Thorburn, 1993; cf. Piggott, 1991, 1999; Goad & Brannen, 2003). Compare (19a) where the extraprosodic consonant is indicated by angle brackets with the illicit representation in (19b) where this consonant is syllabified as a coda.

(19) a. σ σ

g ɑ r i <k>

b. * σ σ

g ɑ r i k

‘stinging jellyfish’

While extraprosodicity is normally restricted to material at word edges and could thus be argued to be unavailable to the string-internal liquid in (17b), the behaviour of [s] in English provides a counter-example to this generalization, thereby opening up the possibility of extraprosodic status being assigned to the liquid in (17b). There is much evidence in support of the view that [s] in sC clusters is not part of the onset (see Goad & Rose, 2004 for recent discussion). While [s] behaves as a coda in some word-internal contexts, e.g., [ɛ́s.tər], *[ɛ́.stər] ‘Esther’, this analysis is unavailable in words like [ɛ́kstrə] ‘extra’ where the rhyme, [ɛk], is full: with limited exceptions, English respects the constraint that (word-internal) rhymes cannot contain more than two positions, VV or VC. It appears, then, that word-internal [s] in words of this shape is extraprosodic; see (20):

(20) σ σ

ɛ k <s> t r ə

In sum, we have seen that there are parallels in adult phonologies for the proposal that, at the CG stage in development, the target liquid is not organized into prosodic structure, as in (17b), thereby avoiding the problem that this kind of representation could lead to the characterization of children’s grammars as rogue grammars.

[17] The floating tone analysis of downstep has been rejected by some phonologists on grounds that there is no formal parallel in segmental phonology (see, e.g., Clark, 1990 and Yip, 2002 for discussion). Extraprosodicity, however, counts as a segmental parallel; see immediately below in the text.

6. Conclusion

In this paper, I have argued that the view that glides are organized as part of a branching onset during the CG stage in development leads to the conclusion that children's grammars are rogue grammars. The problem is that there are no adult languages in which branching onsets are limited to CG only. Although adult grammars permit three options for the syllabification of CGV strings, the branching onset option is only available to those grammars which permit CL branching onsets. An examination of the distribution of CGV outputs from four learners who were in the CG stage revealed that none of the three options for adult CGV emerged as optimal. This suggested the possibility that there may be variation in the realization of the derived glide, something which was supported through an examination of productions from a fifth child. The analysis that was forwarded is that the target liquid is not prosodified in outputs at the stage. It was argued that if the liquid is not anchored into the prosodic representation, its features are free to be phonetically interpreted on either of the adjacent segments, leading to variation in its realization. Returning to the question of rogue grammars, the paper concluded with an examination of some phenomena from adult languages where elements have been proposed to be similarly unaffiliated in output representations.

The proposal was based in large part on the existence of variation in the outputs of one child. Variation is a rampant phenomenon in early grammars and there have been several approaches forwarded in the literature to capture it. One view suggests that variation reflects overlapping stages in development with the effect that more than one grammar competes to yield an output for a given input. A second approach is that where a single grammar permits the generation of more than one output for a given input. A third option, in the realm of segmental phonology, is that variation is due to underspecified representations. In this paper, a fourth option has been proposed, that variation is due to the lack of prosodic affiliation of the relevant segment. For the phenomenon under investigation, the first and second approaches were argued to be inappropriate. The position adopted does, however, share with the underspecification approach the idea that representations, at some level of analysis, are impoverished. Further research on this issue is necessary to determine whether all four of these formal mechanisms are necessary for the characterization of variation in developing grammars.

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