1. **INTRODUCTION:** It has long been known that /s/ fails to respect the phonotactic constraints holding of other obstruents (see Goad 2011 for a recent review). In research that adopts an articulated view of the syllable, the exceptional behavior of /s/ has been captured through formally assigning it some special status: as an appendix in sC/Cs clusters (see Vaux & Wolfe 2009); as a coda preceded by an empty nucleus in (initial) sC clusters (following Kaye 1992); or as part of a complex segment in s+stop (e.g. van de Weijer 1996). None of these proposals contests the position that /s/ is an obstruent. What makes /s/ different from other obstruents, however, is that, like a vocoid, it has robust internal cues for place and manner, which ensures its perceptibility regardless of what it is adjacent to (Wright 2004).

This paper examines /s/ in Blackfoot (Algonquian), which goes well beyond the appendix-like behavior this segment shows in other languages. We propose that this is because Blackfoot /s/ is a vocoid (cf. Derrick 2006, Denzer-King 2009): it can be underlyingly non-moraic (like /j/), monomoraic (like /i/), or bimoraic (like /iː/). Depending on its position in the string, moraic /s/ will surface as a syllable head and/or coda, sometimes with links to preceding or following onsets as well. None of this, we argue, has to be stipulated: the segmental context in which /s/ occurs determines its realization.

2. **SYLLABIFICATION:** When /s/ is set aside, Blackfoot has a relatively simple syllable structure. **Onsets:** (i) complex onsets are banned; (ii) word-medial syllables require onsets. **Rhymes:** (iii) rhymes are maximally bidirectional. **Codas:** (iv) word-medial codas cannot license place features: they are limited to geminates (see (1a)) and placeless consonants, [h] and [ʔ] (1b–c); (v) placeless consonants are confined to coda position. **Syllable contact:** (vi) fricative [h] must be followed by an obstruent (1b), while (vii) [ʔ] can be followed by any contoid (1c) (data from Frantz & Russell 1995 (henceforth FR) and Frantz 2009 (F)).

(1) a. [kakkówa] ‘pigeon’ (F9)       b. [ninña] ‘my father’ (F5)
   c. [áakóhpotaawa] ‘It’s going to snow’ (F24) [sísipoošsit] ‘Punish (whip) yourself!’ (F105)
   d. [moʔsii] ‘hand/arm’ (F12) [ʔsnakohkiti] ‘small doorway’ (F78)

‘Ordinary /s/’ patterns as expected. It is well-formed as a singleton onset, and it can geminate like other consonants (2a). When a non-geminate coda, it respects constraints on place licensing, (iv) above, and syllable contact, (vi) above: fricative [s] can only be followed by coronal stops, [t] and [ð] (2b).

(2) a. [iksissiwa] ‘he is tough’ (F5) b. [ntántíštawa] ‘I told him’ (F154) […paatákís] ‘(I’m eating these) potatoes’ (F97)

3. **UNUSUAL /s/:** Forms with ‘unusual /s/’, by contrast, seem not to respect the syllabification constraints in §2: [s] and [ss] can appear C_C (see (3)); [ss] and [ss] can appear V_C and C_V (see (4)-(5)).

(3) a. Csc [áakokštakiwa] ‘She will count’ (F79)
   b. Cssc [itápsskonakwií] ‘My friend shot at them’ (F50)
   (4) a. Vsss [inikátokatsiwa annisska òsska] ‘he imitated his son-in-law’ (FR61)
   b. Vssss [stámssákonoosa] ‘Try to recognize her!’ (FR166)
   (5) a. CssV [anismpšsiwa] ‘be-3:nodeffirm’ (F133)
   b. CssV [átamssákonoosa] ‘Try to recognize her!’ (FR166)

Contrary to appearance, we show that the moraic representations for /s/ proposed, combined with the syllable structure constraints in §2, lead to a straightforward analysis of these complex patterns (cf. Elfner 2006 and Denzer-King 2009 who instead relax the language’s syllable constraints to accommodate /s/).

4. **ANALYSIS:** Similar to other consonants, ordinary /s/ is underlyingly non-moraic or monomoraic. Non-moraic /s/ is syllabified as an onset, or acquires weight-by-position (Hayes 1989) when syllabified in coda. Underlyingly monomoraic /s/, when intervocalic, yields a geminate.

Unusual /s/ can also be underlyingly monomoraic but it differs from intervocalic [ss] in that it projects its own syllable. This, however, does not need to be stipulated. Rather, the segmental context in which /s/ occurs determines its syllabification. Consider (6) and (7). Note first that, in column (i), the Cs
or Css syllable under focus is preceded by a vowel; in column (ii), it is preceded by a consonant. Note further that, in some forms, the C preceding and/or following /s/ can also be realized as [s], depending on the syllabification requirements of the surrounding segments, as detailed below.

(6) Monomoraic /s/:

- i. **V.Cs.CV**
  - a. Nuc: áá.ko.ks.ta.ki.wa (3a)
  - b. Ons-Nuc:  i.ss.ka (4a)
  - c. Nuc-Ons: a.nis.tá.ps.si.wa (5a)
  - d. Ons-Nuc-Ons: áh.ss.sa.pi.wa 'He enjoyed watching' (FR258)

- ii. **VC.Cs.CV**
  - a. Nuc: mi2.ks.ka.pa.ji.nis.ïsí 'crackers' (F65)
  - b. Ons-Nuc: o.ïs.ts.so.no? ss.ki.po.ka 'then kissed him' (G128)
  - c. Nuc-Ons: ki.ts.so.ká? ps sii 'You’re nice' (F23)

(7) Bimoraic /s/:

- i. **V.Css.CV**
  - a. Nuc: tá.pss.ko.na.ki.wai.ksí (3b)
  - b. Ons-Nuc: ó. ss.ka (4b)
  - c. Nuc-Ons: s.tá.mss.sáá.ko.noo.sa (5b)

We begin with monomoraic /s/ in (6). In (6a-i, 6a-ii), /s/ surfaces as short nuclear [s], as the flanking segments – [k] and [t] in (6a-i), and [k] and [k] in (6a-ii) – can only be onsets, (iv) in §2. As the syllables containing the first of these consonants need nucleii, /s/_/ surfaces as p. See figure for (6a-ii) in (8a).

In (6b-i, 6b-ii), /s/ surfaces as long [ss], syllabified as onset+nucleus. The segment preceding /s/ – a vowel (6b-i) and placeless consonant (6b-ii) – forces /s/ to be parsed in the next syllable. In (6b-i), /s/_/ cannot instead be a coda, yielding *[i, s, k, a], as [sk] do not share place, (iv) in §2. In (6b-ii), placeless [?] must be a coda; see (v) in §2. As no vowel is available for the /s/_/ syllable, /s/_/ projects σ and thereby becomes a nucleus. This syllable then needs an onset, because word-medial syllables require onsets, (ii) in §2. The result is long [ss], which is syllabified as onset+nucleus. The segment following /s/ – [k] in both examples – must become the onset of the following syllable, (iv) in §2. See figure for (6b-ii) in (8b).

In (6c-i, 6c-ii), /s/_/ surfaces as long [ss], syllabified as nucleus+onset. The preceding consonant – [p] in both cases – can only be syllabified in onset, (iv) in §2. /s/ must therefore project σ, becoming the syllable head. As a vowel follows and Blackfoot syllables require onsets, (ii) in §2, an additional link from nuclear /s/_/ is added to the following syllable, yielding long [ss] as nucleus+onset. See (8c).

In (6d-ii), triplet [ss], syllabified as onset-nucleus-onset, arises when /s/_/ is preceded by a consonant and followed by a vowel, as in (6c), but in this case, the preceding consonant is one that can only be a coda, as per (v) in §2. /s/_/ must project a σ. Both the syllable of the following vowel and the /s/_/ syllable itself require onsets, which /s/_/ also satisfies. See (8d) where (6d-ii) can be compared with (6c-ii) in (8c).

(8) a. [mi? .ks... ka…] (6a-ii) b. [... na? .ss... ki…] (6b-ii) c. [...ká? .ps... si] (6c-ii) d. [áh.ss.sa... s] (6d-ii)

Finally, the forms in (7) parallel those in (6) but the nuclear surfaces as long, as /s/_/ is bimoraic in UR.

In sum, our analysis straightforwardly predicts the options that Blackfoot displays, without relaxing the language’s syllable constraints. The segmental context in which /s/ occurs determines its realization. Time permitting, we will show how our analysis extends to word-initial sC and ssC clusters, which follow directly from underlying /s/_/ and /s/_/, and do not require recourse to appendices (cf. Denzer-King 2009).