INTRODUCTION

In this paper I examine the issue of productivity of word formation in Munsee Delaware and its relation to levels of stem formation. Our interest is in seeing what kinds of correlations, if any, can in fact be made between productivity and levels of derivation.

Productivity

Understanding of the meaning of the term ‘productivity’ in relation to word formation varies widely, and some of the accounts of the term that have been advanced will be reviewed below. Informally, I understand productivity to refer to semantically compositional word formation which creates new words without exception. Definitions of productivity must allow for degrees of productivity as well, since it appears to be the case that productivity may be scalar or graded, at least in some instances. Aronoff (1976) assumes that productivity has two main components: (a) semantic compositionality, and that (b) the outputs of truly productive morphological rules need not be listed lexically, the latter being the case since the more productive a morphological rule is the less need there is to list its output.

In the case of extremely productive rules, it may be difficult to determine if a word has been encountered before. Aronoff (1983) makes
a distinction between actual words, which are listed in the lexicon, and potential words, which are the outputs of totally productive word formation rules. This distinction is relevant to Algonquian languages, since in Algonquian languages one often has the impression that there is a very large or perhaps infinite number of potential word stems, which are assembled from their components as speakers need them, as suggested in Leavitt (1992:266–8). Once formed and established as a conventional designation, a word may develop lexical idiosyncracies, such as non-compositional semantics. I adopt an informal version of Aronoff's position: the more productive a rule is, the less the need to list its output.

Types of word structures

Munsee, like other Algonquian languages, has three main classes of words: nouns, verbs, and particles, as well as several minor word classes such as prenouns and preverbs. We ignore particles in this discussion since there appear to be no productive patterns of particle formation, and concentrate on several different types of nouns and verbs. Algonquianists typically assign (uninflected) word stems a maximally tripartite structure, consisting of a root, medial, and final, with both medials and finals being potentially optional. All three of these are positionally defined: roots occur before medials and finals, medials occur before finals but after roots, and finals occur after roots and medials. In some cases all three of these types of morphemes may also have internal structure: there may be “extended” roots, medials may have pre-medials and/or post-medials, and finals may have pre-finals (relevant Delaware data are discussed in O’Meara 1990).

Here we are interested in characterizing inflectable word stems, and can distinguish two levels of stem derivation. The first is what Algonquianists call primary derivation (Bloomfield 1927). Schematically there are two main types of primary derivation which are of potential relevance, as in 1 and 2, and there are other types of word structures which are ignored here. In this paper we ignore the word types in 1 (for which see O’Meara 1990, chapters 4 and 5).

Some of the lexicographic practices of Leavitt and Francis (1984) and McGregor (1987) are consistent with this view, particularly their procedure of listing certain roots and suffixes as lexical entries.
(1) Stem → root–medial–final  
(2) Stem → root–final  

Secondary derivation (Bloomfield 1927) forms inflectable stems from stems by suffixation of a final, as in 3.  

(3) Stem → stem–final  

The distinction between primary and secondary derivation is similar to the concept of levels of derivation found in the theory of Lexical Phonology and Morphology proposed by Kiparsky and others (e.g., Kiparsky 1982, Mohanan 1986), with the significant exception that Lexical Phonology and Morphology makes specific claims about the relation between the operation of phonological rules and morphological operations. We do not wish to recast the traditional Algonquianist distinction in terms of some version of Lexical Phonology and Morphology, however, particularly in view of the well-established empirical shortcomings of Lexical Phonology and Morphology (see Kaisse and Shaw 1985, Spencer 1991:114–6, and Zwicky 1992:358–360 for some of these).  

PRODUCTIVE PRIMARY DERIVATION  

Morphologists such as Aronoff (1976) have made the claim that productive word formation is word- or lexeme-based; that is, that productive word formation operates only upon existing stems. As a result there should be no productive primary derivation in the Algonquianist sense.² Here I will review some data from the derivation of Delaware verb stems which support the position that primary derivation can be a source of productive word formation, a claim that has already been made for Montagnais by Drapeau (1980). There are some caveats, since not all primary verb formation is productive; some examples of these will be discussed also.  

Animate intransitive (AI) verbs, i.e., those intransitive verbs that have an animate subject, can be formed in primary derivation by combining a root with a combination of a prefinal and a final. For example, AI stems  

² This claim is repeated in Aronoff (1994:6–7, 34) in part to avoid the problems that arise with various types of morphemes which lack meanings.
can be formed with the prefinal /-iik-/ ‘grow’ and the final /-ii/ added to roots, as in 4–16. The only limit is the semantic or pragmatic plausibility of the combination.

(4) \textit{piimikw}  
\textit{/piim+ii+iik+w/}  
diagonal-grow-AF-3  
‘he (plant) grows crooked’  

(5) \textit{spwiikwak}  
\textit{/spw+iik+ii+w/}  
close together-grow-AF-3-PL  
‘they grow close together’  

(6) \textit{takwiikwak}  
\textit{/takw+ii+iik+w/}  
together-grow-AF-3-PL  
‘they grow together’  

(7) \textit{aap\~{c}iikwak}  
\textit{/aap+iik+iik+iw/}  
to death-grow-AF-3-PL  
‘they are overgrown, go to seed’  

(8) \textit{w\~{o}liikw}  
\textit{/w\~{o}l+iik+iw/}  
good-grow-AF-3  
‘s/he grows nicely’  

(9) \textit{\~{c}\~{a}\~{c}piikwak}  
\textit{/\~{c}\~{a}cap+iik+iw/}  
separate (redup)-grow-AF-3-PL  
‘they grow apart’  

(10) \textit{liikw}  
\textit{/al+iik+iw/}  
thus-grow-AF-3  
‘s/he grows in a certain manner, direction’  

(11) \textit{waakiikw}  
\textit{/waak+iik+iw/}  
bend-grow-AF-3  
‘s/he grows crooked’  

(12) \textit{saakiikw}  
\textit{/saak+iik+iw/}  
out-grow-AF-3  
‘s/he sprouts, grows outwards’  

(13) \textit{al\~{w}miikw}  
\textit{/alam+iik+iw/}  
away-grow-AF-3  
‘s/he grows’  

(14) \textit{ma\~{c}iikw}  
\textit{/ma\~{c}+iik+iw/}  
bad-grow-AF-3  
‘s/he grows badly’  

(15) \textit{k\~{s}iikw}  
\textit{/k\~{a}s+iik+iw/}  
fast-grow-AF-3  
‘s/he grows quickly’  

(16) \textit{wsaamiikw}  
\textit{/w\~{s}aam+iik+iw/}  
excess-grow-AF-3  
‘s/he grows too much’  

\footnote{Denny (1984) proposes that finals comparable to /-ii/ in other Algonquian languages form verbs which are assigned to the “process” aspectual class. We will not pursue this hypothesis here.}

\footnote{At verbs ending in /-ii/ need to be divided into two classes. “Unstable” stem-final /-ii/ shifts to [a] before the third person independent order marker /-w/; “stable” stem-final /-ii/ does not. See Goddard (1979, chapter 2) for details.}
The final /-ii/ is also added to some roots, without a prefinal:

(17) **wiikʷ**
/wiik+ii-w/

* dwell there-AF-3

‘s/he lives there’

(18) **apʷ**
/ap+ii-w/

* be there-AF-3

‘s/he is there’

(19) **txʷak**
/tax+ii-w-ak/

* so many-AF-3-PL

‘they are so many’

(20) **ooteewʷ**
/ooteew+ii-w/

* visit-AF-3

‘s/he visits’

(21) **wiisʷ**
/wiis+ii-w/

* fat-AF-3

‘s/he is fat’

(22) **maaweewʷak**
/maaweew+ii-w-ak/

* gather-AF-3-PL

‘they hold, attend a service’

(23) **saakʷ**
/saak+ii-w/

* protrude-AF-3

‘s/he sprouts, emerges’

While /-ii/ occurs attached directly to roots in a variety of cases there is no way of characterizing the roots to which it does attach, and in general it is not true to say that /-ii/ can attach freely to any root, which would be in line with viewing the direct attachment of /-ii/ to roots as not being productive. It is possible that a more fine-grained analysis of the roots which co-occur with /-ii/ might reveal a clearer characterization of the conditions for attachment of /-ii/ to roots.

Other combinations of prefinal and final are also productive, such as that for ‘throw,’ as in 24 (and discussed in greater detail in O’Meara 1992:329–331). Here we give a sampling of AI (or transitivized AI) stems formed with the root /alom-/ ‘away, start’ and a number of different prefinal and final combinations, in 24–31. All of the prefinal-final combinations productively combine with a wide variety of roots.

(24) **alomaheew**
/alom+aah+ee-w/

* away-throw-AI-3

‘s/he throws s.t. off’

(25) **alomaakčehl**
/alom+aakče+hl-w/⁶

* away-jump-motion-3

‘s/he jumps away’

⁶ Word-final /-w/ is deleted after consonants other than /-k/.
PRODUCTIVE SECONDARY DERIVATION

**AI verbs in l-kee**

Suffixes may be added to stems to form stems as well; that is, in secondary derivation. Some instances of secondary derivation are productive. Here we describe the derivation of animate intransitive indefinite object verbs from transitive animate (TA) and transitive inanimate (TI) stems by suffixation of l-kee/, as in 32-44. We consider this formation productive since without exception every TA or TI stem has a corresponding derived AI stem, and since speakers seem able to form these stems without difficulty.

(26) \( aləməaʁəwɪhl \)
\( /aləm+aəʁəwɪ+hł-w/ \)
away-swim-motion-3
's/he swims away'

(28) \( aləmɪɪkwəw \)
\( /aləm+ɪɪkw+əsii-w/ \)
away-crawl-Al-3
's/he crawls away'

(30) \( aləmham \)
\( /aləm+ah+əm-w/ \)
away-by tool-final-3
's/he paddles away'

(27) \( aləmakoosəw \)
\( /aləm+əkəw+əsii-w/ \)
away-grasp-Al-3
's/he climbs away'

(29) \( aləmɪɪhleew \)
\( /aləm+hl+aa-w \)
away-motion-Al-2
's/he flies away'

(31) \( aləmxookw \)
\( /aləm+ax+əkw-w/ \)
away-wind
's/he blows away in wind'

(32) \( aləmʃiikeew \)
\( /aləmaʃ+kee-w/ \)
's/he starts cutting'

(33) \( ansəniikeew \)
\( /ansən+kee-w/ \)
's/he scoops things'

(34) \( anshiikeew \)
\( /ansah+kee-w/ \)
's/he scoops things up (with a tool)'

(35) \( kšiixpehlattiikeew \)
\( /kəšiixpehlat+kee-w/ \)
's/he washes things'

(36) \( kteekhiikeew \)
\( /kateekəh+kee-w/ \)
's/he takes photographs/makes drawings'

(37) \( mʃamootiikeew \)
\( /maʃamoot+kee-w/ \)
's/he piles things up'

---

7 For example, \( ntehkwsɨtke \) 'I'm through cutting things'; the morphophonology of stems formed with /-kee/ is discussed in O'Meara (1990:201–3).
(38) naxksiikeew
   /naxkwɔs+kee-w/
   ‘s/he sets things on fire’

(39) niiptiikeew
   /niipat+kee-w/
   ‘s/he stands things up’

(40) pahcohkeew
   /pahcool+kee-w/
   ‘s/he cheats people’

(41) akehkiinkeew
   /akehkiim+kee-w/
   ‘s/he teaches people’

(42) kxeelameekeew
   /kaxeelam+kee-w/
   ‘s/he is jealous of people’

(43) wiitaweenkeew
   /wiitaweem+kee-w/
   ‘s/he gets married’

(44) xankeew
   /axam+kee-w/
   ‘s/he feeds people’

Nouns in /-kan/

Consider now the case of noun stems formed with the suffix /-kan/, as in 45–48. These can either be analysed as being formed from TA or TI stems formed with various finals or from the corresponding derived indefinite-object AI stems discussed above. Typically, nouns formed with /-kan/ contain one of the instrumental finals — /-ɔs/ ‘by heat’, /-ɔʃ/ ‘by cutting’, /-ɔn/ ‘by hand’, /-ah/ ‘by tool’ — or various TI finals ending in /-t/. The nouns in 45–48 each have a corresponding TA or TI verb stem. The formation of the derived nouns exemplified in 45–48 is as productive as that of the formation of the corresponding derived AI verbs formed with /-kee/ discussed just above, even though not every TA or TI stem that contains an instrumental final forms a noun with /-kan/. The suffix /-kan/ forms nouns that refer to concrete objects. If there is no denotatum for the form to refer to, the noun stem will be non-occurring but would still be a potential stem. This is consistent with the idea that the outputs of productive word formation rules have little salience, which I would claim to be the case with the derived verbs discussed in the previous section, while the outputs of less productive rules are more salient (Aronoff 1983: 167; Lieber 1992:2–4).

(45) čii̯khiikan
    /čiik+ah+kan/\(^8\)
    sweep-by tool-NOM
    ‘broom’

(46) paxkšiikan
    /paxk+ɔʃ+kan/\(^8\)
    burst-by cutting-NOM
    ‘knife’

\(^8\) The epenthetic vowel /-/ii-/ is inserted between the verb stem and the suffix /-kan/ in the same pattern as for the verb suffix /-kee/.
The suffix /-kan/ also appears in a minor pattern, as in 49–54. In these forms the suffix /-kan/ is added to an Al stem ending in the long vowel /-eel/, triggering shift of the stem-final /-ee/ to [-aa]. No stems conforming to this pattern other than those below have been found. We list the noun stem and the corresponding verb, if available.

(49a) aaptoon+aakan
    speak-NOM
    ‘word, a voice’

(50a) alohk+aakan
    work-NOM
    ‘servant’

(51a) kšiiixiinčw+aakan
    wash dishes-NOM
    ‘dishcloth’

(52a) ahkiih+aakan
    plant-NOM
    ‘field’

(53) tɔmɔšahkw+aakan
    cut down wood-NOM
    ‘saw’

(54) niintaw+aakan
    fire-NOM
    ‘lantern’

Some nouns ending in /-(ii)kan/ appear to be based upon a possible but non-occurring transitive stem (55–62). There are also a few which apparently are not formed on a transitive stem (or else are based on a very obscure one), as in 63–66. In the examples we segment the stem for expository convenience, but do not claim that these nouns are productively derived from underlying verb stems.

(55) akwaan+iikan
    ‘fishnet’

(56) kpaapehlat+iikan
    ‘curtain’

9 No Al stem was recorded, but /tɔmɔšahkwaakee-/ would be expected.

10 Although the Al root underlying ‘lantern’ is non-occurring, it is attested in the reduplicated agent noun nehniintawees ‘fire dragon’ (Hewitt 1896).
MUNSEE DELAWARE WORD FORMATION

(57) lehleewh+iikan
‘fan’

(58) maxkeewehlat+iikan
‘flag’

(59) piintpehlat+iikan
‘funnel’

(60) sakeeh+iikan
‘ladder’

(61) taatpɔn+iikan
‘wagon’

(62) takwaloon+iikan
‘scissors’

(63) wiilɔšt+iikan
‘his head’

(64) wiixee+kan
‘body hair’

(65) ntawamp+iikan
‘my jaw’

(66) aš+iikan
‘sock’

Abstract nouns in /-w-aakan/

Abstract noun stems are formed with /-w-aakan/. These can be analysed as containing a suffix /-w-/ and the suffix /-aakan/. Drapeau (1979) refers to the Montagnais cognate of /-w-/ as ‘connective w’. Connective /-w-/ and /-aakan/ can be added freely to AI stems or to objectless TI (i.e., pseudo-intransitive) stems, as in 67–86.¹¹

Connective /-w-/ has the morphophonological effect of shifting stem-final unstable /-ii/ to [-a], as in the examples below, with the exception of 69 in which the verb stem contains stem-final ‘stable’ /-ii/, which does not undergo this shift (see footnote 5). Similarly, stem-final /-aa/ shifts to [-ee], as in 86, which is based on the AI stem /lapwaa-/ ‘be smart.’

(67) pomaawsɔwaakan
/pɔmaawɔsii+w+aakan/
live-CW-NOM
‘life’

(68) sookɔnɔpaasɔwaakan
/sookɔnɔpaasii+w+aakan/
be baptized-CW-NOM
‘baptism’

(69) aamwiitwaakan
/aamwii+w+aakan/
get up from lying-CW-NOM
‘Resurrection’

(70) ahwaaltɔwaakan
/ahwaal+tii+w+aakan/
love-recip-CW-NOM
‘loving’

(71) alaaxiimɔwaakan
/alaaxiimwii+w+aakan/
rest-CW-NOM
‘resting’

(72) holoniixɔwaakan
/iholoniixasii+w+aakan/
speak an Indian language-CW-NOM
‘speaking an Indian language, Delaware’

¹¹ Two nouns containing /-w-aakan/ appear to be formed from TI verbs: miiɛɔwaakan ‘food’, and neemwaakan ‘sight’. I do not have enough information to determine if these are exceptions or if TI verbs productively form abstract nouns of this type.
In 87–94 I list a variety of noun stems ending in /-aakan/ which clearly must be lexically listed, as their structures are not transparent.
NON-PRODUCTIVE DERIVATION

Both primary and secondary derivation may be non-productive, and here we give examples of both types.

Non-productive primary derivation

Some cases of non-productive primary derivation are clearly old and can in fact be assigned to Proto-Algonquian. There are a few Delaware nouns formed with a noun final /-ay/, and a number of these can be reconstructed for Proto-Algonquian (e.g., 95 and 105 below; see Aubin (1975) for reconstructions).

The final /-ay/ is found in a small number of nouns. Examples of /-ay/ added to roots which occur in other noun stems are given in 95–99. In 95–109, /-ay/ occurs in forms which are morphologically obscure. The examples in this section represent nearly all the noun stems containing the noun final /-ay/ which were recorded. There do not appear to be any productive patterns of noun formation with /-ay/, nor does /-ay/ appear to have a discernable meaning. All nouns containing /-ay/ are analysed as being listed rather than derived.

(93) apahahk+aakan
  ‘roof’

(94) wiiwəlah+aakan-al
  ‘harness’ (pl.)

(95) čiipay
    /čiip+ay/  frightful-final
    ‘ghost’

(96) kihkay
    /kihk+ay/  mature-final
    ‘chief’

(97) nihtoonayak
    /na-htoon+ay-ak/
    1-mouth-final-PL
    ‘my whiskers, beard’ (pl.)

(98) wtalaamtoonay
    /wa-t-alaam+toon+ay/
    3-EP-inside-mouth-final
    ‘inside his mouth’

(99) mihtkwinootoay^{12}
    /mihtəkw+ii+noot+ay/
    tree-EP-bag-final
    ‘basket’

(100) aweeyayəs
    /aweey+ya+y+ay+əs/
    someone-EP-final-noun final
    ‘animal’

^{12} This stem appears to be a compound noun consisting of /mihtəkw/ ‘tree’ and /nootəy/ ‘bag’. /nootəy/ does not occur freely, but only in a few other nouns of this type, such as šəłpołiinootay ‘purse.’
In a few forms /-ay/ appears to be added to a sequence of root or stem followed by a nominalizing suffix /-n/ (111–113).

### Non-productive secondary derivation

A few nouns end in a nominalizing suffix /-(oo)n/, which does not productively form new noun stems, as in 114–122. Stems of this type result diachronically from the suffixation of a secondary nominalizing

13 The stem /-hak+ay/ is also found in the noun hwakees ‘bark’; originally /w-hak+ay+as/, with metathesis of initial /wh/ and contraction of /-ay+as/ to [-ees].

14 The At verb stem nsokxasaw /nasok+ax+as+ii-w/ ‘s/he tans her/himself’ may contain the root /ax-/ ‘skin.’

15 Also cited in Goddard (1982:21) as wasiiixay.

16 The element /-asaan-/ was not recorded in any other forms, and its meaning is uncertain.
suffix /-n/ to various types of middle reflexive verbs. Proto-Algonquian AI middle reflexive verbs ended in the vowel *o. Proto-Algonquian *o and *oo merge in Delaware as /oo/, and what old middle reflexive verbs survive in Delaware are not distinguishable from verb stems ending in long /-ii/ because of subsequent developments (Goddard 1979:63–64). Delaware nouns formed from old middle reflexives in *-o are very few in number, and the middle reflexive bases from which some of these nouns would be formed are not attested in modern Delaware.

Verb stems which correspond to noun stems formed with /-(oo)n/ do occur, as in the examples in 114–117. However, no attempt is made to derive the nouns from the verbs: the formation of noun stems with /-(oo)n/ is not productive, and appears to be limited to those listed in 114–122.

(114a) sakaxeehoon /sak+ax+ee+h+oon/ grasp-ear-PM-cause-final ‘earring’

(114b) sakaxeehəw /sak+axee+h+i-i-w/ grasp-ear-cause-AI-3 ‘she wears earrings’ (AI)

(115a) ampiis+oon ‘cradleboard’

(115b) takwampiisəw /takwampiisii-i-w/ tied together-3 ‘s/he is tied together’ (AI)

(116a) weewehkaas+oon ‘swing’

(116b) weewehkaasəw /weewehkaasii-i-w/ ‘s/he swings’ (AI)

(117a) ahpap+oon ‘chair’

(117b) ahpapəw /ahpapii-i-w/ sit upon-3 ‘s/he sits upon’ (AI)

(118a) kpahoon /kəp+ah+oon/ close-by tool-final ‘door’

(118b) kpaheew /kəp+ah+w+i-eew/ close-by-tool-final-3.3 ‘s/he shuts s.o. out’ (TA)

(119) kehkaasiinkweehoon /keh+kkaas+iinkw+ee+h+oon/ redup-wipe-face-PM-cause-final ‘towel’

(120) laalohkweehoon /laa+ohkw+ee+h+oon/ rub-hair-PM-cause-final ‘comb’
CONCLUSION

The overall picture that we see is that in fact there is no direct correlation between levels of derivation and productivity. Some types of primary word formation are productive and others are not, and the same holds true of secondary derivation. This is true regardless of whether we construe levels of derivation as in the traditional Algonquianist distinction between primary and secondary derivation or in some version of the potentially more articulated models of Lexical Phonology and Morphology.

REFERENCES


17 Although there is no attested Delaware verb underlying this form, Goddard (1982:28) notes that the Delaware word eeøntaxpwiink ‘table’ is formed upon an old middle reflexive stem composed of PA *taθ- ‘there’ and *-po ‘eat.’ This old combination would also directly correspond to 121.

18 Cited in Goddard (1982:22), where the existence of an Al stem (n’wiwaschi) ‘I carry it on my back’ in an unknown Delaware dialect is also noted.


