PART 1

Phonology

Phonological aspects of Arandic baby talk*

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Baby Talk (BT), also known as child-directed speech, is a non-standard form of speech used by adults when talking to infants. In Arandic languages BT involves the use of a small set of unique but widely known words, onomatopoeic-derived words, as well as phonological modifications to standard vocabulary. As in neighboring Warlpiri (Laughren 1984), Arandic BT contains a simplified phonology that conflates coronal contrasts and avoids rhotics and consonant clusters. Whilst standard Arandic words are mostly vowel-initial, this weak initial syllable is omitted in BT and the preferred CVCV(C) word structure is achieved through patterns of reduplication and truncation. The BT phonology becomes more complex with the perceived development of the child's phonological competence, a case of fine-tuning over time.

1. Introduction

Baby talk (BT), also known as "child-directed-speech" or "motherese", is a non-standard form of speech used by adults when talking to infants and young children. BT is used in many Aboriginal communities and Laughren's (1984) work on Warlpiri baby talk (WBT) is one of the few and most comprehensive studies of this speech style in any Aboriginal language. This article takes Laughren's work on WBT as a starting point with the aim of examining Arandic baby talk (ABT). As in Warlpiri, ABT involves regular phonological modification to Standard Arandic

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(SA) speech (the unmarked register), as well as the use of a small set of unique BT words that replace SA vocabulary, typically characterized by semantic simplification. Prosodically, ABT is also characterized by a higher and more extreme pitch contour.

The outline of this chapter is as follows. In §1 we provide background on both ABT and the Arandic languages, and discuss variation in ABT forms based on age of the child. We also outline our methodology. In §2 we identify the segmental processes involved in creating ABT from the SA forms. In §3 we discuss various word formation processes in ABT and in §4 we consider the possible origins of the unique ABT terms. §5 discusses the nature of BT across languages, showing that ABT follows many of the same types of word formation process as those attested elsewhere. §6 concludes with a discussion of how the various segmental and word formation processes, as well as the unique BT vocabulary, achieve the preferred sounds and word structures of ABT. Despite the divergent phonologies of Standard Warlpiri and Arandic, the attested sounds and word structures in the BT register of both languages are remarkably similar. This raises the question of how widespread the BT word structures identified in this paper are in the BT of other Australian Aboriginal languages.

1.1 Background to Arandic baby talk

Arandic speakers use the term *thathath angkem* [ˈt̪ɐt̪ɐt̪ ɐŋˈgəmə], literally "saying *thathath*" to refer to both infant speech and the adult speech directed at children. Arandic speakers maintain that adult child-directed speech is an imitation of the way infants talk, and certainly the reduced coronal contrasts and absence of rhotics in ABT also appears to be a feature of Arandic children's early speech. Laughren (1984) notes that Warlpiri children's language consists of features of both Standard adult and BT speech modes. Although our study involves observation of only one Arandic child at 3; 7 years of age, she too exhibited features of both speech modes.

As is the case in Warlpiri, ABT is used by adults when addressing a child or when speaking to another adult when the utterance is intended to be noticed by a child. Arandic speakers explain that they use ABT so that children can better understand them. While this study does not draw on detailed participant observation in everyday contexts, the situations in which ABT has been observed are when adults are being instructive or wanting children to pay attention. The latter is often done by distracting a child rather than giving a command. For example, an adult might say in ABT "Look at the dog!" instead of saying, "Stop crying".

Laughren (1984: 88) argues that the primary function of WBT is "to symbolize the conventional social relations established within Warlpiri society between dependent children and the adults on which they depend", since there is no evidence that children necessarily understand BT better than adult speech. This is

possibly also the case in ABT, though Arandic adults say they use ABT to enhance understanding between adults and young children.

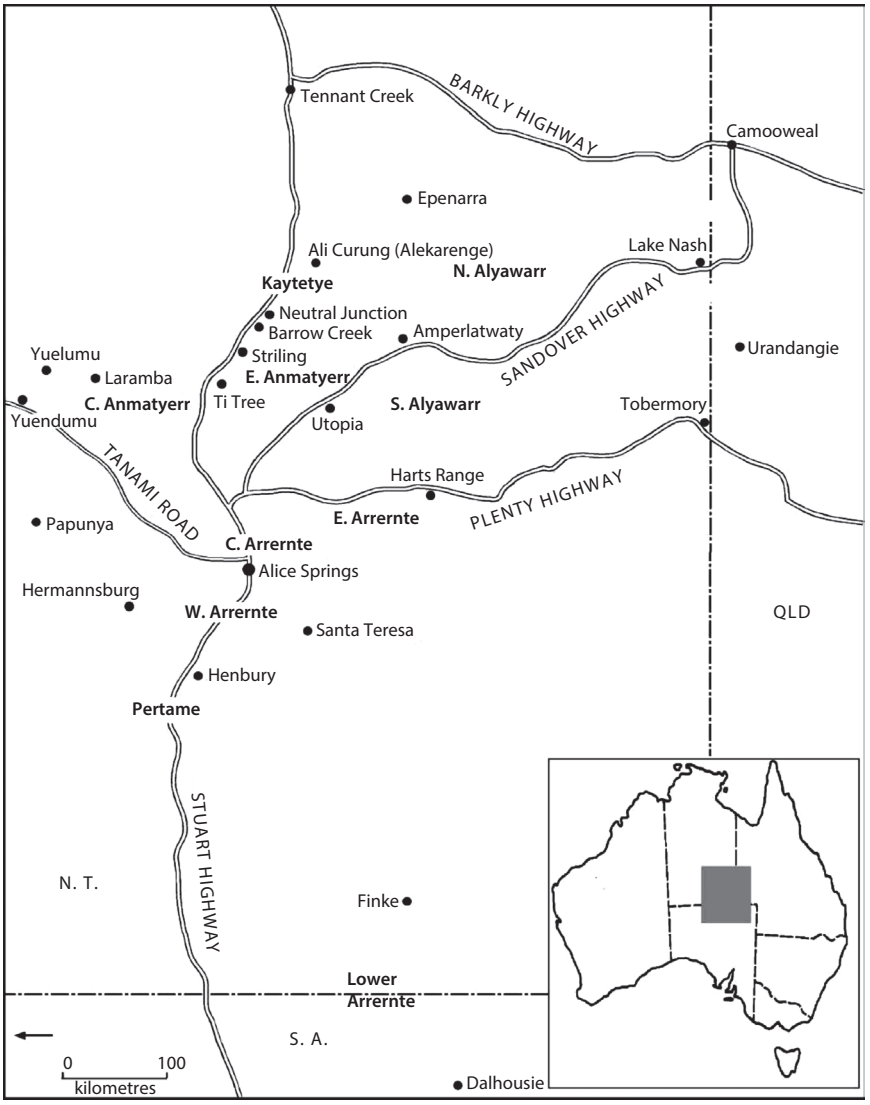
BT is only one of a number of alternate registers used across Central Australia. There is a complex sign language used in an array of contexts (Kendon 1988; Green & Wilkins in press) and a respect register used in contexts where cultural value is attached to indirect communication, such as mother-in-law/son-in-law avoidance. As in BT, the respect register uses some unique substitute vocabulary as well as regular modification to SA words. Songs too consist of language that is distinct from everyday speech and, like ABT, they make use of some unique lexemes and a simplified consonant inventory (Turpin & Green 2011). Throughout the region there is much inter-dialect and inter-register borrowing to create unique vocabulary in these non-standard registers. We return to this issue in §4.2, where we identify the possible sources of many unique ABT lexical items.

1.2 Background to Arandic languages

The Arandic language subgroup borders Warlpiri to the west, a language of the Ngumpin-Yapa subgroup. Both subgroups are part of the greater Pama-Nyungan Australian language family. The Arandic group can be divided into two subgroups, one that consists of only Kaytetye (K), and the other that includes Alyawarr (ALY), Central Arrernte (ARR), Western Arrernte (WARR), Central Anmatyerr (C) and Eastern Anmatyerr (EA) (see map). Hale refers to the latter subgroup as the Urtwa subgroup (1983: 96). In this paper terms common to the Urtwa languages are abbreviated (A), terms unique to one or two languages are followed by the abbreviation for the particular language(s), and terms common to all Arandic languages have no abbreviation. The primary languages referred to in this paper are Central Anmatyerr (C) and Kaytetye (K), which are not mutually intelligible. There are approximately 1,500 speakers of both varieties of Anmatyerr combined (Green pers.com 2011) and 200 speakers of Kaytetye. Green (2010: vii) estimates that there are 5,500 speakers of Arandic languages combined.

The orthography for individual Arandic languages differs. For convenience we use the Central Anmatyerr orthography (the first language of the third author of this paper) for all Arandic words, even when the word is not used in Central Anmatyerr.[1] A significant difference between this orthography and that of some other Arandic orthographies is that words are not written with a final "e" and words of (V)CV structure are written with a final "a". The Anmatyerr orthography suffices for ABT with one modification: ABT words that always end in [a] are written with final "a", as these contrast with words that have no final vowel or a

1. For a description of this orthography see Green (2010: ix–xii; 2005: 169).



Map 1. Arandic language varieties (map reproduced from Simpson et al. (2001: xvii) with permission of the editors and author Jenny Green)

different vowel; for example, *kweka* [ˈkʊka] compared with *menh* [mɪn̪], [mɪɲ] "vegetable food" and *kakey* [ˈkakɪ].

Phonological analyses of Arandic languages also differ. Of particular significance is the underlying VC syllable structure posited by Breen and Pensalfini (1999). This contrasts with the CV analyses proposed by Wilkins (1989), Koch

(1997) and Pensalfini (1998: 2). In this paper we give broad phonetic transcriptions of examples; and where syllables are referred to, we assume (C)(C)V(C) structure. Primary stress falls on the first CV syllable of citation forms (see Henderson 1998: 210). Contra Henderson (1998), we regard foot structure to be trochaic in Arandic languages and the word-initial vowel to be extra-metrical.[2] The treatment of word-initial vowels in ABT is discussed in §3.1.

1.3 Age-graded forms of Arandic baby talk

ABT is used with children up to the age of around 5. In the case of some kin terms, however, the SA word is not used until the child is about 12. There is also a difference between early ABT and Late ABT in relation to pronunciation, semantics and occasional lexicon. For example, Central Anmatyerr adults use the ABT word *yaya* [ˈjɐjɐ] for both "sister" and "female cousin" when talking to young children.[3] Then, after the child is about 6, adults use *yaya* only for "elder sister" and the SA word *altyeley* [ɐʌˈcəlɪ] for "female cousin". It is not until the child is about 12 that the SA word *angkwerey* [ɐŋˈgʊɻɪ] "elder sister" is used in place of ABT *yaya*.

We encountered one BT category with different lexemes in early and late ABT. Example (1) compares the standard adult form *anew* "classificatory spouse" with the two age-graded ABT forms in Central Anmatyerr.

	Standard form	**Early ABT form**	**Late ABT form**	**Gloss**
(1)	*anew* [ɐˈnʊə], [ɐˈnʊː]	*mit-mit* (C) [ˈmɪtmɪt]	*new-anew* [ˈnʊɐˈnʊ](C)	spouse[4]
		mit-mit (C) [ˈmɪtəˈmɪt] (C)		

Example (1) shows that SA *anew* "spouse", common to all Arandic languages, has two BT forms in Central Anmatyerr, both of which are reduplications: *mit-mit*, which is probably based on English "mate"; and *new-anew*.[5] Both ABT terms *mit-mit* and *new-anew* include the categories of sister-in-law and brother-in-law, unlike the SA equivalent. *Mit-mit* is used when talking to children up until the age of about 5 to mean "the child's age mates of the opposite sex who are in the classificatory spouse kinship category". After the age of 5 a different ABT form is used: *anew-anew*. The adult form *anew* is not used with children until they are about 12. In addition, there

2. Henderson (1998: 200) states that Arrernte words are composed of binary iambic feet in citation form.

3. This semantic simplification is also found in WBT (Laughren 1984: 85).

4. Arandic kin terms are classificatory. Here "spouse" refers to any member of the opposite sex who is in the kinship category that the referent would ideally marry into.

5. Reduplication is a common word formation process in ABT and is discussed in §3.2.

is a phonetic difference in the pronunciation of *mit-mit* in early and late ABT. In late ABT a schwa is realized between the two parts of a consonant initial reduplication, thus *mit-mit* [ˈmɪtəˈmɪt]. In (1) we represent this as a developmental continuum ([ˈmɪtmɪt] > [ˈmɪtəˈmɪtə] > [ˈnuanu]) rather than categorically Early or Late BT. Other phonetic differences between early and late ABT relate primarily to the number of coronal distinctions used, where early ABT has only one, but late ABT has two. Thus, in addition to the use of different lexemes, late ABT is prosodically and segmentally more complex than early ABT.

There are also some semantic differences between early and late ABT terms. For example, until the child is about 2, the ABT term *tywetywety* [ˈcʊcʊc] means "large animal". After 2 years, the ABT word *kangkew* [ˈkɐŋgʊ] or *kangkey* [ˈkɐŋgɪ] is used to mean "kangaroo" and *tywetywety* is used only to mean "dog". When the child is about 5 or 6, the SA words *aherr* [ɐˈɻəɾə]~[ˈɐːɾə] "kangaroo" and *alek* [ɐˈləkə] (ᴋ)/*akngwely* [ɐˈᵏŋʊʎə] (ᴀ) "dog" are used. Similarly, ABT *mey-mey* [ˈmɪmɪ] covers "all types of mothers-in-law", whereas the later ABT term *ngkwernip* [ˈŋgʊnip] refers to a certain kind of "mother-in-law" (one that spans four generations, usually a man's daughter's daughter's daughter). Arandic adults use these different forms of ABT depending on the age and linguistic ability of the child.

The lexicon of ABT is potentially an open class, as new ABT terms are created through the word formation processes outlined in §3. Nevertheless, Arandic speakers distinguish between the widely recognized terms proper to ABT,[6] of which there are some 25 terms, and words that are essentially SA forms albeit with simplified phonology. In addition, some Arandic speakers recognize BT words that are unique to particular children and their caregivers. For example, [ˈtɪtɪ ˈɐːpɔ] is used by a Kaytetye mother and child for "breast milk". This is probably based on English *titty* and the widely attested Ngumpin-yapa term *ngabulu* "milk" (languages familiar to the child's father).[7] Arandic speakers do not regard such terms as ABT proper, yet such terms confirm the productivity of ABT word formation processes and its ability to accommodate multi-lingual contexts.

1.4 Methodology

The data for this study are drawn from several sources. Searches of Arandic language dictionaries revealed a large number of unique ABT terms.[8] These were

6. Laughren identifies terms that are proper to BT, meaning that they are used exclusively in adult–child linguistic interactions, and others that are derived from SW (1984: 80).

7. We thank Felicity Meakins for bringing the origins of this term to our attention.

8. Alyawarr (Green 1992), Eastern and Central Anmatyerr (Green 2010), Eastern and Central Arrernte (Henderson & Dobson 1994) and Kaytetye (Turpin & Ross 2012). Some Arrernte ABT terms are also documented in Henderson (1998).

then collated and used as an elicitation tool for BT terms in Central Anmatyerr, Kaytetye and Alyawarr. For both Central Anmatyerr and Kaytetye, a 40-year-old mother with a child under 5 and three older people of grandparent age were interviewed. Two elicitation sessions were held for each language: a one-person elicitation session and a three-person elicitation session. Audio sessions were recorded digitally on a Fostex FR2 with a Rode NT4 microphone and copies deposited at the Australian Institute for Aboriginal and Torres Strait Islanders Studies. The Alyawarr elicitation session was not recorded.

1.5 Arandic phonemes

Arandic segmental inventories and phonotactic patterns are somewhat unusual for Australian languages.[9] They have up to five coronal contrasts, a set of prestopped nasals and a velar approximant (see Table 1). In addition, all consonants other than /w/ and /ɯ/, have a rounded variety (e.g. compare *atnka* [ɐᵗnˈgɐ] "alive" (K) with *atnkwa* [ɐᵗnˈgʷɐ] "asleep" (K)). Rounding can be heard in a variety of contexts within a word depending on the surrounding consonants and vowels, and can spread over several syllables.[10] Alyawarr and Kaytetye have an additional contrast that has been referred to as prepalatalized; for example, Kaytetye *aylperre* [ɐjˈlˈbərə] "fish", *alperre* [ɐlˈbərə] "leaf", *arlperre* [ɐlˈbərə] "whitewood". Breen (2001:60) suggests prepalatalization could be a supersegmental feature; however, Harvey (2011:79) suggests these are a /j/ coda plus onset sequence (these are not shown in Table 1). In some dialects of Arrernte and Eastern Anmatyerr these prepalatalized forms occur as allophones of retroflex consonants following a word-initial vowel; for example, *artwa* "man" [ɐʲʲtʷa]. These segmental features are all absent in neighbouring Warlpiri.

All Arandic languages have at least two vowels: /a/ [ɐ] and /ə/ [ə]~[e], [ɪ], [ʊ]. Some speakers pronounce stressed /ə/ as a mid front vowel. The allophone [ɪ] occurs before a palatal; for example, *akeyt* [ɐˈkɪʲtə] "firestick" (K), *akely* [ɐˈkɪʎə] "small" (K). It also occurs word-initially in most languages; for example, *inap* [ɪˈnɐpə] "echidna" (A). Note that the pronunciation of word-initial vowels, which are typically unstressed in Arandic, varies greatly. So too does the word-final vowel, which can vary from a schwa to [ɐ], or it may be absent altogether. Henderson (1998:58) finds that its pronunciation depends on interactions with surrounding segments, pragmatic force and dialect. The allophone [ʊ] occurs in the context of a preceding rounded consonant (/Cʷ/). Arrernte has an additional vowel, /u/

9. See summaries by Koch (2004:132, 133), Breen (2001), Breen and Pensalfini (1999), Henderson (1998) and Harvey (2011:85).

10. Breen (2001:60) regards rounding as a supersegmental feature.

Table 1. Arandic consonantal inventory

	Labial	Coronal				Velar
		Apical		Laminal		
		Alveolar	Retroflex	Dental	Palatal	
Stop	p	t	ʈ	t̪	c	k
Nasal	m	n	ɳ	n̪	ɲ	ŋ
Pre-stopped nasal	ᵖm	ᵗn	ᵗɳ	ᵗn̪	ᶜɲ	ᵏŋ
Lateral		l	ɭ	l̪	ʎ	
Trill		ɾ				
Continuant	w		ɻ		j	ɰ

[ʊː], which contrasts in length with [ʊ] /Cʷə/. Most Arandic languages also have a high front vowel phoneme /i/[ɛ], which is quite restricted in distribution.[11]

2. Segmental processes in ABT

Both WBT and ABT exhibit a reduced consonantal inventory and a reduced number of consonant sequences. Given the differences in their respective standard consonant inventories, the similarity of the consonants in their BTs is striking (compare Tables 2 and 3).

2.1 Collapse of coronal distinctions in early ABT

Tables 2 and 3 show the consonant inventories of WBT and early ABT respectively. Both have only one (laminal) coronal place of articulation, though there is free variation in how it is realized in early ABT.

Table 2. Consonants in WBT (Laughren 1984: 74)

	Labial	Lamino-palatal	Velar
Stop	p	c	k
Nasal	m	ɲ	ŋ
Lateral		ʎ	
Continuant	w	j	

11. There are differing phonemic analyses of Arandic vowels. See Breen (2001) and Henderson (1998) for detailed discussion on Arandic phonology.

Table 3. Consonants in early ABT

	Labial	Coronal	Velar
Stop	p	t̪ ~ c	k
Nasal	m	n̪ ~ ɲ	ŋ
Lateral		l̪ ~ ʎ	
Continuant	w	j	

Both WBT and early ABT lack apicals, whilst SA has two apical places of articulation (alveolar and retroflex, see Table 1). In early ABT most adult words that have an apical are pronounced as a laminal. Some common examples are shown in Table 4 (1–15). Borrowings from English words that contain an apical are also pronounced as a laminal in early ABT. These are shown in Table 4 (10–15).

Table 4. Apicals pronounced as a laminal in early ABT

	Standard form (or possible source word if different)	Early ABT form	Gloss
1	*atwem* [ɐˈtʊmə] (A)	*thwem* [cʊm], [t̪ʊm] (C)	hit
2	*irntang* [əˈnɖɐŋ] (C)	*nthang* [n̪t̪ɐŋ],[ɲcɐŋ] (C)	rock, hill
3	*arnang* [ɐˈnɐŋ] (C)	*nhang* [n̪ɐŋ], [ɲɐŋ] (C)	stick, grass
4	*kwart* [ˈkʷɐʈə]	*kwath* [kʷɐt̪],[kʷɐc] (C)	egg
5	*mantarr* [ˈmɐndɐɾə]	*mantyey* [ˈmɐɲcɪ] (C)[12]	clothes
6	*aperley* [ɐˈpəlɪ][13]	*pelyey* [ˈpɪʎɪ] (C, K)	father's mother
7	*awerley* [ɐˈwʊlɪ] (K)	*welyey-welyey* [ˈwʊʎɪˈwʊʎɪ] (K)	father's brother
8	*apmarley* [ɐˈᵖmɐlɪ]	*malyey-malyey* [ˈmɐʎɪˈmɐʎɪ] (C,K)	mother's elder sister
9	*mern* [ˈmənɳə] (C)	*menh* [mɪn̪], [mɪɲ] (C)	vegetable, fruit
10	[ˈpʊtə] from Eng "boot"	*puth* [pʊt̪], *puty* [pʊc] (C,K)	shoe
11	[ˈlɛlɪ] from Eng "lolly"	*laley* [ˈʎɐʎɪ] (C,K)	sweet food
12	[ˈlɛlɐ] from Eng "la-la"	*lyalya* [ˈʎɐʎɐ], [ˈl̪ɐl̪ɐ] (C)	sing
13	[ˈtɐtɐ] from Eng "ta-ta"	*thatha* [ˈt̪ɐt̪ɐ] (C)	go
14	[ˈtɐː] from Eng "ta" (?)	*tha* [t̪ɐʔ]	give it here!
15	[ˈɐːndɪ] from Eng "aunt"	*antyey* [ˈɐɲcɪ] (C)	aunt

12. Rhotic sounds are avoided in ABT. See §2.4.

13. In Kaytetye, *-ey* [ɪ] is the 1sg kin possessor marker, whereas in other Arandic languages *-ey* is replaced with *-aty* [ɐcə] (A). A kin term suffixed with *-ey* is also the form used when not marked for possession, as in (6) *aperl-ey*. This is the most likely source of the ABT kin terms.

2.2 Collapse of laminal distinctions in ABT

As suggested in §2.1, the lamino-palatal and lamino-dental contrast found in SA, such as *atya* [ˈɐcɐ] "1sgERG" and *atha* [ˈɐt̪ɐ] "grass" (K), is collapsed in both early and late ABT. Examples are shown in Table 5.

Table 5. Collapse of laminal distinctions in ABT

Standard form	Early ABT	Gloss
1 *itya* [ˈɪcɐ] (C)	*itha* [ˈɪcɐ], [ˈɪt̪ɐ] (C)	nothing
2 *atya* [ˈɐcɐ] (K)	*atha* [ˈɐcɐ], [ˈɐt̪ɐ] (K)	1sgERG
3 *thep* [ˈt̪ɛpə] (A)	*thep-thep* [ˈt̪ɛpt̪ɛp], [ˈcɪpcɪp] (C, K)	bird
4 *iwenh* [ɪˈwʊn̪ə] (A)	*wenh* [ˈwʊn̪],[ˈwʊɲ],[ˈwʊn̪ɐ],[ˈwʊɲɐ] (A)	what
5 *alhewelhem* [ɐˈl̪ɔwəl̪əmə] (A)	*lhewelhem* [ˈʎʊʎʊm], [ˈl̪ʊl̪ʊm] (C)	wash (self)
6 *palhay!* [ˈpɐl̪æɪ̯] (A)	*palyay* [ˈpɐʎæɪ̯]	watch out!

The realization of the laminal consonant in ABT varies. Often its pronunciation sounds as if more of the tongue blade is used against a larger part of the oral cavity than in adult speech, so that the consonant sounds both lamino-palatal and lamino-dental. In some elicitation sessions, the pronunciation of the laminal sound is closer to that of the SA form, either lamino-palatal or lamino-dental. In some cases two pronunciations of an ABT word were given: a lamino-palatal and a lamino-dental, as in Tables 4 and 5. Our third author, a native speaker literate in Anmatyerr, found it difficult to decide whether ABT terms with a laminal should be written as an interdental (e.g. *th,* or palatal, e.g. *ty*), though opted for interdental in most cases.

There is a similarity here with the articulation of the single laminal phoneme in Ngaanyatjarra, a Western Desert language of Central Australia. Butcher (1995: 33) notes that the laminal articulation is tongue-tip down throughout, involving dental as well as some alveolar contact, and that a following high vowel causes them to become alveo-palatal. There is also a possible physical motivation for the neutralization. Arandic speakers state that ABT is based on infant speech. One of the features of young children is that their oral cavities are relatively small in relation to the tongue. As a result, the blade of the tongue fills much of the oral cavity (cf. Kent 1990). This may result in young children having a reduced ability to make multiple apical and laminal contrasts.

2.3 Introduction of apicals in late ABT

A coronal distinction emerges in late ABT, as apicals become variably produced. Examples (1)–(7) in Table 6 show apicals, pronounced laminal in early ABT, are

pronounced as apical in late ABT. For example, (1) *aperley* "father's mother" is pronounced [ˈpɪɻɪ] in early ABT (Table 4) and [ˈpɪlɪ] in late ABT. Apicals in ABT are typically unreleased when word-final, as in (8)–(13) in Table 7.

Table 6. Apicals in late ABT

	Standard form (or probable source word if different)	Late ABT	Gloss
1	*aperley* [ɐˈpəlɪ]	*perley* [ˈpɪlɪ]	father's mother
2	*apmarley* [ɐˈᵖmɐlɪ]	*malyey-malyey* [ˈmɐlɪˈmɐlɪ] (C)	mother's elder sibling
3	*apwert* [ɐˈpʊtə] (A)	*put* [pʊt] (C)	hill, stone, rock
4	[ˈlɐlɐ] from Eng "la-la"	*la-la* [ˈlala] (C)	sing
5	[ˈlɐlɪ] from Eng "lolly"	*laley* [ˈlɐlɪ]	lolly
6	[ˈtɐtɐ] from Eng "ta-ta"	*ta-ta* [ˈtɐtɐ] (C)	good-bye
7	[ˈɐːndɪ] from Eng "aunty" (C)	*antey* [ˈɐndɪ] (C)	father's sister
8	*nyerlel* [ˈɲeɭəɭə] (C)	*nyel* [ɲɪl] (C)	cold
9	[ˈtɐlɐ] from Eng "doll"	*tal-tal* [ˈtɐltɐl]	doll
10	*artartey* [ɐˈtɐʈɪ] (C)	*tartart* [ˈtɐʈɐʈ] (C)	mother's father
11	[ˈpʊcɪkɐtə] from Eng "pussycat"	*put-put* [ˈpʊtpʊt] (C)	cat
12	*mert* [ˈmɪʈə] (C) from Eng "mate" (?)	*met-met* [ˈmɪtmɪt], [ˈmɪtəˈmɪt] (C)	spouse
13	*perlangket* [pəˈlɐŋgətə] from Eng "blanket"	*pangket* [ˈpɐŋkɪt] (C, K)	blanket
14	*arnawerr* [ɐˈɳɐwəɾə] (K)	*nawey* [ˈnɐwɪ] (K)	father's sibling[14]
15	*kamern* [ˈkɐməɳə] (C)	*kamen* [ˈkɐmɐn], [ˈkɐmɐɳ] (C, WARR)	mother's brother
16	*atyerrey* [ɐˈcəɾɪ] (K), *atyey* [ɐˈcɪ] (C)	*aytey-aytey* [ˈtɪjæi̯̯ʲtɪ], [æi̯̯ʲtɪjæi̯̯ʲtɪ] (K,ALY)	younger sibling

In late ABT the retroflex and apical-alveolar contrast is only made intervocalically, as in examples (1) [ˈpɪlɪ], (2) [ˈmɐlɪˈmɐlɪ] and (10) [ˈtɐʈɐʈ] in Table 6. Note that retroflexion in SA is mostly heard on the surrounding vowels. Word-initially and as a coda, apicals are usually alveolar, as in (3) [pʊt], (8) [ɲɪl], (12) [ˈmɪtˈmɪt] and (14) [ˈnɐwɪ]. The two exceptions are (15) *kamen*, where the coda has both retroflex and apical alveolar pronunciations, and (10) [ˈtɐʈɐʈ]. It may be significant that both are disyllabic words. In SA, apicals typically become retroflexed in the environment of a preceding apical plus vowel. For example, the present

14. "Father's elder brother or sister"; however, in ABT it is used for "all father's siblings".

tense morpheme in *ayn-enk* "eat-PRS" (K) is pronounced with a retroflex [ɳ], [æɪ̯ʲnənɳgə], whereas in a non-apical environment such as *ap-enk* "go-PRS" it is realized as an alveolar [ɐˈpəngə]. Example (16) in Table 6 *aytey-aytey* [ˈtɪjæɪ̯ʲtɪ], [æɪ̯ʲtɪjæɪ̯ʲtɪ] shows the only prepalatal documented in ABT (note that the SA source word is also prepalatal).[15]

When apicals are introduced there is little evidence of neutralization. Thus, when speakers judge that mimicking children's speech should include apicals as a category, they introduce the full adult version of the apical category.

2.4 Constraints on rhotics in ABT

One way that ABT avoids rhotics is through regular substitutions. These are outlined in Tables 7 and 8.

Table 7. Avoidance of /ɻ/ in ABT

	Standard form (or source word if different)	ABT	Gloss
1	*rapet* [ˈɻɐpətə] from English	*wapeth* [ˈwɐpɪc], [ˈwɐpɪt̪]	rabbit
2	*arwel* [ɐˈɻʊlə] (K, Aly)	*wulya* [ˈwʊʎə] (K, Aly)	stick
3	*aray!* [ɐˈɻæɪ̯] (A)	*way* [wæɪ̯] (C)	look!
4	[ˈɻɔːtə] from English "road"	[wɔt], [ɔːt] (C)	road
5	*war* [ˈwɐɻə] (K)	*wawa* [ˈwɐwɐ]	hot, fire, sun
6	*ker* [ˈkəɻə] (A)	*key* [kɪː]	meat
7	*apmer* [ɐˈpmɐɻə]	*mey-mey* [ˈmɪmɪ]	camp, home
8	*mwer* [ˈmʊɻə] (A)	*mey-mey* [ˈmɪmɪ]	mother-in-law
9	*war-ey-ay!* [ˈwɐɻɪjæɪ̯] (A)	*wayeyay*[ˈwæɻjɪjæɪ̯] (C)	nothing at all
10	*kwelteringk* [ˈkʊldɻɪŋgə], from Eng "cool drink"	*kuntyeng* [ˈkʊɲɟɪŋg][16]	soft drink

2.4.1 /ɻ/ ⇒ /w/, /ø/, /j/

Table 7 shows the ABT realization of words with /ɻ/ in SA. In initial position /ɻ/ is replaced by /w/ (examples 1–5), though before a long vowel it may be elided, as in (4). In final position /ɻ/ is replaced by /j/ (examples 6–8). In both SA and

15. In Standard Alyawarr *aytey* [æɪ̯ʲti] "younger sibling" is the form that takes possessive kin suffixes, e.g. *aytey-aty* "my younger sibling" [æɪ̯ʲtijɐcə]. The reduplicated form *aytey-aytey*, example (16) in Table 7, is said to be both SA and ABT, and does not take these suffixes. This suggests it may have been borrowed into the Standard register from BT.

16. Words of three or more syllables are typically shortened to a disyllabic foot in ABT. See §3.3.

ABT, /əj/ is phonetically a vowel word-finally; for example, *alay* [ɐˈlæɪ̯]; /j/ is only pronounced when there is a following morpheme, as in (9). In ABT the resulting single-syllable word is reduplicated in the case of (7) and (8) or lengthened in the case of (6).

The Anmatyerr child we observed realized /ɻ/ as [w] in the personal names "Lara" and "Clarrie", thus providing some evidence for Arandic adults' claim that ABT is based on an imitation of the sounds made by infants (see §1.1). Rhotics are late-acquired in many languages, including English, where /ɻ/ in word onset position also tends to be realized as a labial glide, often until the age of 4 or 5 (Smit 1993). This is probably due to the complex articulation of liquids in general, which involve coordinated timing between two tongue body gestures (cf. Browman & Goldstein 1986), a challenge for young learners who have relatively large tongues (Kent 1990). It is therefore possible that the subset of sounds found in ABT reflects those that are typically found in early child speech.

2.4.2 /ɾ/ ⇒ /ø/, /j/

The realization of the flap /ɾ/ in ABT is similar to that of glides in SA, where /ɯ/, /j/ and /w/ may be elided. In SA, the infrequent glide /ɯ/, which only occurs as the onset to a stressed syllable, may optionally be elided, resulting in a stressed, and what we hear as lengthened, initial vowel. For example, *aherrk* [ɐˈɯəɾkə] "sun" (ĸ) can also be pronounced [ˈɐːɾkə].[17] Only the vowel length and stress differentiate *aherrk* [ˈɐːɾkə] "sun" from *arrka* [ɐɾˈkɐ] "bloodwood tree" (ĸ). In ABT /ɯ/ is always elided, resulting in a stressed long vowel, or replacement vocabulary is used. For example, the word *waw* [ˈwɐwɐ] "hot" is used for "sun" instead of *aherrk* [ɐˈɯəɾkə].

In ABT /ɾ/ is similarly elided when it is the onset of a stressed syllable, as in examples (1) and (2) in Table 8. As with /ɯ/, the elision leaves the initial vowel stressed and long. This is also attested in the variable pronunciation of the SA word *arrertem* [ɐˈɾəʈəmə] "over there" (ĸ), which can also be pronounced as [ˈɐːʈəmə] (compare with *artem* [ɐˈʈəmə] "might chop").

The realization of /ɾ/ ⇒ /j/ is also attested in WBT (Laughren 1984: 85).

2.5 Constraints on other consonants in ABT

There are no instances of prestopped nasals in ABT. SA words with these sounds are either pronounced as a nasal in ABT, as in (1) and (2) in Table 9, or are avoided through the use of replacement vocabulary, as in (3) *papap*, *pa.*

17. Length may be a correlate of stress in Arandic languages. The nature of stress in Arandic languages requires further investigation.

Table 8. Flap realized as a continuant in ABT: /ɾ/ ⇒ /ɰ/, /j/

	Standard form	ABT	Gloss
1	*arrangkem* [ɐˈɾɐŋgəmə] (A)	*angkem* [ˈɐːŋgəm] (C)	cry
2	*arrengey* [ɐˈɾəŋɪ]	*angey* [ˈɐːŋɪ] (K), [ˈɪːŋɪ] (C) *ngangang* [ˈŋaŋaŋ] (ARR) *(a)ngang* [ˈŋaŋ] (ARR)	father's father
3	*mantarr* [ˈmɐntɐɾə]	*mantyey* [ˈmɐɲcɪ]	clothes
4	*arnawerr* [ɐˈɳɐwərə] (K)	*nawey* [ˈnɐwɪ] (K)	father's elder brother
5	*anherrey* [ɐˈn̪əɾɪ]	*nhey-nhey* [ˈn̪ɪ n̪ɪ]	mother-in-law
6	*atyerrey* [ɐˈcəɾɪ] (K) *atyey* [ɐˈcɪ] (C)	*aytey-aytey* [ˈtɪjæɪ̯ˈtɪ], [æɪ̯ʲˈtɪjæɪ̯ʲtɪ], [ˈcɪjɐˈcɪ] (K, ALY) *tyey-tyey* [ˈcɪcɪ] (C)	younger sibling

Table 9. Constraints on prestopped nasals in ABT

	Standard form	ABT	Gloss
1	*apmarley* [ɐˈᵖmɐlɪ]	*marley-marley* [ˈmɐlɪˈmɐlɪ] (C)	mother's elder sibling
2	*apmer* [ɐˈᵖməɻə]	*mey-mey* [ˈmɪmɪ]	camp, home
3	*akngey* [ɐˈkŋɪ] (A) *arlwey* [ɐˈlwɪ] (K)	*papap* [ˈpɐpɐp][18] (K) *pa* [ˈpɐː], *papa* [ˈpɐpɐ] (C)	father

Whilst the initial velar nasal is common in SA, this is typically avoided in ABT. This is often achieved by using replacement vocabulary, such as ABT *mim* [ˈmɪmɐ] instead of *ngkerrk* [ˈŋgəɾkə] "sore" and ABT *tyew-tyew* [ˈcuːcuː] instead of *ngangkay* [ˈŋɐŋgɐjə] "traditional healer". In other cases the initial consonant of the SA word is deleted. For example, *ngapa* [ˈŋɐpɐ], a Warlpiri word, becomes [ˈɐpɐ] "water" (C) in ABT, as it also does in WBT (Laughren 1984: 77). Recall too the pronunciation of Ngumpin-yapa *ngabalu* as ABT [ˈɐːpɔ] by one Arandic mother–child pair, as discussed in §1.3. A word-initial velar nasal does occur, however, in a late ABT form [ˈŋgʊnip] from SA *ngkwernerrp* [ˈŋgʊnəɾpə] "mother-in-law".

2.6 Reduction of consonant sequences

Many consonant sequences in SA (some of which are contained within the same syllable) involve a rhotic, lateral or nasal followed by a stop. In ABT it is typically

18. Note that in Arrernte, BT *papap* means "father's mother", which replaces SA *aperl-aperl* "father's mother" (Henderson 1998: 248).

the initial consonant of these sequences (often the coda of the preceding syllable) that is elided. Examples are shown in Table 10.

Table 10. Reduction of the first consonant in consonant sequences in ABT

	Standard form (or source word if different)	**ABT**	**Gloss**
1	*lpway* [lˈpwæɪ̯] (C)	*pway* [ˈpwæɪ̯] (C)	creek
2	*irlpang* [ɪlˈpɐŋ] (C)	*pang* [pɐŋ] (C)	ear
3	*arlkarl* [ɐlˈkɐlə] (K)	*kalkal* [ˈkɐlkɐl] (K)	cold
4	*elkwemen* [ʊlˈkʊmənə] (K)	*kwemen* [ˈkʊmən] (K)	old woman
5	*arrtyanem* [ɐɾˈcɐnəmə] (C)	*tyanem* [ˈcɐnəm] (C)	run
6	*ngka*! [ˈŋgɐʔ] cf. English "ta"	*tha!* [t̪ɐʔ]	give it here!
7	*mpa*! [ˈmbɐʔ]	*pa!* [pɐʔ]	let's go!
8	*antywem* [ɐˈɲcʊmə] (C)	*thwem* [ˈt̪ʊmə] (C)	drink
9	*waylpel* [ˈwæɪ̯lpələ] (K, ALY)	[ˈwɐpɪ] (K, ALY)	white person
10	*pwelp-* [ˈpʊlpə]	*pwep-* [pʊp]	swim
11	*kwerrkwerrk* [ˈkʊɾˈkʊɾkə]	*kwekwek* [ˈkʊkʊk]	monster, devil
12	*ngkwernerrp* [ˈŋgʊnerpə] (K, ALY)	*ngkwenip* [ˈŋgʊnɪp], [ˈkʊnɪp] (K, ALY)	mother-in-law
13	*arrangkem* [ɐˈɾɐŋgəmə] (A)	*angkem* [ˈɐːŋgəm] (C)	cry
14	*kalty* [ˈkɐʌcə]	*kanty* [kɐnc]	know something
15	*kwelteringk* [ˈkʊldɻɪŋgə] from "cool drink"	*kwentyengk* [ˈkʊɲɟɪŋg]	soft drink

Note that the homorganic nasal plus stop sequence /ŋk/ remains in (12) *ngkwernerrp* [ˈŋgʊnəɾpə] ⇒ [ˈŋgʊnɪp] (late ABT) and (13) *arrangkem* [ɐˈɾɐŋgəmə] ⇒ [ˈɐːŋgəm]. In contrast, lateral-stop sequences are changed to a nasal-stop homorganic sequence, as in (14) and (15), as these are permitted in ABT, perhaps due to greater articulatory ease. Given the form in (15), where schwa elision results in a stop plus /ɻ/ sequence in the SA form [ˈkʊldɻɪŋgə], the ABT form deletes /ɻ/ and the lateral is replaced with a homorganic nasal [ˈkʊɲcɪŋg].

We have shown how apicals, prestopped nasals, coronals, rhotics and consonant sequences in SA words are avoided in ABT through regular sound substitutions. Another way these consonants are avoided is through substituting entire SA words with unique ABT words. For example, SA *ngkerrk* [ˈŋgəɾkə], "sore" (K, ALY) is replaced with ABT *mima* [ˈmɪmɐ]. The unique ABT lexicon is discussed in §4. We turn now to a treatment of vowels in ABT.

2.7 Vowels in ABT

Table 11 illustrates the vowels in ABT: [ɪ], [ɐ], [ʊ] and somewhat rare [ə], [ɛ] and [æɪ̯]. In both SA and ABT [ɪ] is a tense rather than a lax vowel. The dipthong [æɪ̯] occurs in one ABT form (13) [ˈpæɪ̯tɪˈpæɪ̯tɪ], which is based on the English word "bitey". We found only one ABT term that has /a/ following a rounded consonant, example (1) *kwatha* [ˈkʷɐc] "egg".

Table 11. Vowels in ABT

	Standard form (or possible source word if different)	**ABT**	**Gloss**
1	*kwart* [ˈkwɐʈə]	*kwaty* [kʷɐc], *kwath* [kʷɐʈ̪] (C)	egg
2	*aperley* [ɐˈpəlɪ]	*pelyey* [ˈpɪʎɪ] (C,K)	father's mother
3	*kwaty* [ˈkʷɐcə] (A)	*kweka* [ˈkʊkɐ] (K, ALY)	water
4	*ngangkay*	*thew-thew* [ˈcuːcuː], [ˈt̪uːt̪uː]	traditional healer
5	*alek* [ɐˈləkə] (K), *arengk* [ɐˈɻəŋgə] (ALY), *akngwely* [ɐˈᵏŋʊʎə] (ARR,C)	*tywetywety* [ˈcʊcʊc] (C, K)	dog
6	*mert* [ˈmɪʈə] (C) from Eng "mate" cf. *anew* [ɐˈnʊɐ]	*met-met* [ˈmɪtmɪt], [ˈmɪtəˈmɪt] (C)	spouse
7	*thep* [ˈt̪ɛpə] (A), *thangkern* [ˈt̪ɐŋgənə] (K)	*thep-thep* [ˈt̪ɛpt̪ɛp], [ˈcɪpcɪp] (C, K)	bird
8	*itya* [ˈɪcɐ] (C)	*itha* [ˈɪcɐ],[ˈɪt̪ɐ] (C)	nothing
9	*apey(-ak-el)* [ɐˈpɪjɐkəl̪ə] (K)	*apey* [ˈɐːpɪ][19]	nothing
10	*ngapa* [ˈŋɐpɐ] (W) cf. *kwaty* [ˈkʷɐcə] (A)	*apa* [ˈɐpɐ][20] (C,W)	water
11	*arrengey* [ɐˈrəŋɪ]	*angey* [ˈɐŋɪ] (K), [ˈɪŋɪ] (C)	father's father
12	[ˈɐːndɪ] from Eng "aunt", cf. *awenhey* (A), akeley (k)	*antyey* [ˈɐɲcɪ] (C)	aunt
13	[ˈpæɪ̯tɪ] from Eng "bitey"	*paytey* [ˈpæɪ̯tɪ], *paytey-paytey* [ˈpæɪ̯tɪˈpæɪ̯tɪ]	insect
14	from Eng "*pa*" (?) cf. *akngey* [ɐˈkŋɪ](A) *arlwey* [ɐˈl̪wɪ](K)	*pa* [ˈpɐː] (C)	father

19. This word is used to comfort a child, similar to "there, there, there" in English. It has a specific intonational pattern which may account for the lengthened initial vowel.

20. It is difficult to identify one syllable as the more prominent in *apa* "water". However, if compared with SA *apa* [ɐˈpɐ] (K) "for no particular reason", the initial syllable of the ABT form *apa* [ˈɐpɐ] "water" is slightly more prominent.

We also find also a quantity opposition for [ʊ] in ABT. Example (4) *tyew-tyew* [ˈcʊːcʊː] "traditional healer" contrasts in length with *tywetywety* "dog" [ˈcʊcʊc] (5). Note that [ʊː] is analysed as a vowel-glide sequence in SA, where it is usually pronounced as a diphthong [ˈcʊɐˈcʊː]. Analyses of [ʊ] in SA find this an allophone of /e/ in the context of a rounded consonant (/C^{w}ə/).

Most ABT words are consonant-initial; however, there are four ABT words that begin with /a/ and one that begins with /i/. *Itya* [ˈɪcɐ]~[ˈɪn̪tɐ] (8) "no, nothing" is an interjection and also exists in SA. Initial [a] is stressed and sounds lengthened in the four /a/ initial ABT words (examples 9–12). However, this is not analysed as a length contrast in ABT as the short and long vowels occur in complementary distribution: short vowels occur word-internally and long vowels word-initially. Note that ABT *angey* is based on SA *ahangey*, with a reduction in the vowel-glide sequence /aha/ ⇒ /a/, a reduction which also occurs as an optional pronunciation of SA words with the velar glide. Example (14), ABT *pa,* is the only example of a long /a/ vowel in non-initial position. Other monosyllabic and monomoraic words end in a glottal stop. The vowel is presumably lengthened in *pa* to constitute a binary foot.

Schwa is rare in ABT. It only occurs between the base and the reduplicant, as in (6) *met-met* [ˈmɪtəˈmɪt] "spouse", and only in late ABT. Only one ABT term has [ɛ], *thep-thep* (7) [ˈt̪ɛpt̪ɛp], and this ABT word can also be pronounced with [i], [ˈcɪpcɪp]. In ABT [ɛ] can be regarded as a realization of /ə/ in the initial, stressed syllable. Most SA words with a schwa are pronounced as [ɪ] in ABT, as in (2), (6) and the variant of (7).

Unlike SA, final vowels in ABT are always full vowels, as in (3), and never [ə].[21] The treatment of schwa as either null or as a full vowel is interesting in light of cross-linguistic findings that schwa is difficult for children to produce, and therefore only acquired by the age of 2;6 or 3 (e.g. German – Kehoe & Lleó 2003; Dutch – Fikkert 1994; Levelt 2008). For example, English learners tend to initially omit word-initial unstressed syllables containing a schwa, (e.g. *banana* /bəˈnænə/ > [ˈnænə]; *appeared* /əˈpɪəd/ > [ˈpɪəd]) and then later produce them with a full vowel (*appeared* /əˈpɪəd/ > [ʌˈpɪəd]) (Davies, Yuen & Demuth 2011). It is not yet clear when English-speaking children begin to consistently use schwa in an adult-like reduced form. Interestingly, schwa is also regarded by researchers of Germanic languages as being prosodically (e.g. Kager 1989) or featurally/articulatorily (van Oostendorp 1998) deficient. Perhaps this contributes to the later acquisition of this vowel cross-linguistically, and to its low use in ABT.

21. Breen (2001:49) calls this a "featureless" vowel. See also Breen and Pensalfini (1999:4), who represent this /e/.

3. Word formation processes in ABT

3.1 Initial vowel deletion

A number of researchers have observed that whilst most SA words begin with a vowel, many ABT forms begin with a consonant (Henderson 1998: 248). Table 12 shows some of the consonant-initial ABT forms where the source word has an initial vowel. As discussed in §2.7, there are five ABT words that always begin with a vowel (examples 8–12 in Table 11). In all but (10) the resulting word would only contain one syllable if the initial vowel were deleted. This is a classic case of word-minimality, where a phonological process is attenuated if the resulting word form would constitute less than a binary foot (e.g. McCarthy & Prince 1986).[22] The word-formation processes underlying (9) in Table 11 *apey* most likely also involve morpheme deletion. The initial vowel of ABT *apa* (example 10) is the result of deleting the word-initial velar-nasal (*ngapa*). In Standard Warlpiri all words begin with a consonant, thus it is striking that WBT has a handful of similar [ɐ] initial words, which suggests a similar constraint on velar-nasals in word initial position in WBT.[23]

Table 12. Deletion of word-initial vowels in ABT

	Standard form and possible source	ABT	Gloss
1	*arnawerr* [ɐˈɳaweɾə] (K)	*nawey* [ˈnawi] (K, ALY)	father's older brother
2	*atwem* [aˈtʊmə] (A)	*thwem* [cʊm], [t̪ʊm] (C)	hit
3	*irntang* [eˈɳɖaŋ] (C)	*nthang* [n̪t̪aŋ], [ɲcaŋ] (C)	rock, hill
4	*aperley* [aˈpeɭɪ]	*pelyey* [ˈpɪʎɪ] (C,K)	father's mother
5	*awerley* [aˈwʊɭɪ] (K)	*welyey-welyey* [ˈwʊʎɪˈwʊʎɪ] (K)	father's brother
6	*apmarley* [aᵖmaɭɪ]	*malyey-malyey* [ˈmaʎɪˈmaʎɪ] (K)	nephew, young uncle
7	*arnang* [aˈɳaŋ] (C)	*nhang* [n̪aŋ], [ɲaŋ] (C)	stick, grass
8	*anherrey* [eˈn̪eɾɪ]	*nhey-nhey* [ˈn̪ɪn̪ɪ] (ARR)	mother-in-law
9	*apmer* [ɐˈpməɻə]	*mey-mey* [ˈmɪmɪ]	camp, home
10	*mwer* [ˈmʊɻə] (A)	*mey-mey* [ˈmɪmɪ] *mwey-mwey* [ˈmʷɪmʷɪ](ARR)	mother-in-law

(*Continued*)

22. In Central Anmatyerr, monosyllabic words (CV or VCV) always have an increment *-ang*, which could be evidence of a word minimality effect in SA.

23. SW *nyampu* "this/here" is realized as *ampu* in WBT, suggesting the constraint may extend to word initial palatal-nasals (Laughren 1984: 77).

Table 12. (Continued)

Standard form and possible source	ABT	Gloss
11 *atyerrey* [ɐˈcerɪ] (K), *atyey* [ɐˈcɪ] (C)	*tyey-tyey* [ˈcɪcɪ]	younger sibling
12 *iwenh* [ɪˈwʊn̪ə] (A)	*wunh* [ˈwʊn̪ɐ], [ˈwʊɲɐ] (A)	what
13 *alhewelhem* [ɐˈl̪ɔwəl̪əmə] (A)	*lhewelhem* [ˈɻʊɻʊm], [ˈl̪ʊl̪ʊm] (C)	wash (self)
14 *artartey* [ɐˈʈɐʈɪ] (C), *tartart* [ˈtɐʈɐʈə] (ARR)	*tartart* [ˈtɐʈɐʈ] (C)	mother's father
15 *apwert* [ɐˈpʊtə] (A)	*put* [pʊt], [pʊt̪] (C)	hill, stone, rock

As illustrated throughout this paper, ABT forms tend to be truncated to a foot of prosodic structure (CVC, CVCV, or CVCVC), and/or constitute reduplicated disyllabic forms (see §3.2). Such processes are also common in early child speech.

3.2 Reduplication

3.2.1 *Whole-word reduplication*

Whole-word reduplication is a common strategy for forming ABT words. The source word can be from another Arandic language or from English. ABT forms that are whole word reduplications (minus final schwa) and their source word are shown in Table 13.

Examples (1–8) show CVC reduplications. Examples (6–8) show CVC reduplications, but with the option of an intervening schwa, a pronunciation occurring in late ABT. Examples (9)–(16) show CVCV reduplications. Although final schwa is not included in the reduplicated ABT form, the (full) final vowel [ɪ] is, providing support for the notion that the final schwa is featurally/prosodically deficient (see §2.7).

One possible explanation for the reduplication patterns in (17)–(19) is that the first CVC of the base form is mapped into the ABT form, followed by the whole word – the disyllable containing the initial vowel of the SA forms (VCVC). Thus the word formation process of the ABT form in (17) could be *anew* ⇒ *new* plus *anew* = *new-anew* [ˈnʊɛnʊ]. That the intervening vowel between the reduplicant and base is clearly the initial vowel of the Standard form rather than the schwa that surfaces before a consonant-initial word is evident in (19) *tey-**ay**tey* [ˈtɪj-æ̯ʲtɪ] (K). Example (19) also shows an optional ABT pronunciation with the initial vowel on the first part of the reduplicated form: ***ay**tey-aytey* [æ̯ʲˈtɪj-æ̯ʲtɪ]. Introduction of the word-initial vowel may be a feature of late ABT, as adults move towards the SA phonology.

Table 13. Whole word reduplication in ABT

	Possible source word	ABT	Gloss
1	*thep* [ˈt̪ɛpə] (A)	*thep-thep* [ˈt̪ɛpt̪ɛp],[ˈcɪpcɪp] (C,K)	bird
2	[ˈcɪpə] from Eng "sheep"	*tyep-tyep* [ˈcɪpcɪp], [ˈcɪpɪcɪpɪ] (K)	sheep
3	[ˈpʊcɪ] from Eng "pussy"	*pwet-pwet* [ˈpʊtpʊt] (C), *pwetyey-pwetyey* [ˈpʊcɪˈpʊcɪ] (K)	cat
4	[ˈpɪkə] from Eng "pig"	*pek-pek* [ˈpɪkpɪk], [ˈpɪkəˈpɪk] (K)	pig
5	Onomatopoeia from Eng "brrm"	*pwempwem* [ˈbʊmbʊm]	car, truck
6	*kwen* [ˈkʊnə] (C)	*kwen-kwen* [ˈkʊnkʊn], [ˈkʊnəˈkʊn] (C)	underneath, below
7	*mert* [ˈmɪʈə] (C) from Eng "mate"	*met-met* [ˈmɪtmɪt], [ˈmɪtəˈmɪt] (C)	spouse
8	*kern* [ˈkəɲə] (C)	*ken-ken* [ˈkənkən],[ˈkənəˈkən] (C)	above, high
9	*awerley* [ɐˈwʊlɪ] (K)	*welyey-welyey* [ˈwʊʎɪˈwʊʎɪ] (K)	mother's brother
10	*warley* [ˈwɛlɪ] (K)	*walyey-walyey* [ˈwɛʎˈwɛʎɪ] (K)	house
11	*apmarley* [ɐˈᵖmɛlɪ]	*malyey-malyey* [ˈmɛʎɪˈmɛʎɪ]	mother's elder sibling
12	[ˈcawɪ] from Eng "joey"	*tyawey-tyawey* [ˈcɐwɪˈcɐwɪ] (K)	kangaroo
13	[ˈpæ̱tɪ] from Eng "bitey"	*paytey-paytey* [ˈpæ̱tɪˈpæ̱tɪ] (K)	insect
14	[ˈkɐpə][24] from Eng "calf"	*kapey-kapey* [ˈkɐpɪˈkɐpɪ]	calf
15	[ˈmʊwənə], [ˈmʊːnə] from Eng "moon"	*mweney-mweney* [ˈmʊnɪˈmʊnɪ]	moon
16	[ˈnɐnɪkʊtə] from Eng "nanny goat"	*naney-naney* [ˈnɐnɪˈnɐnɪ] (K)	goat
17	*anew* [ɐˈnʊɐ]	*new-anew* [ˈnʊɐnʊ] (C)	spouse
18	*akeley* [ɐˈkəlɪ] (K)	*kel-akel* [ˈkəlɐˈkəl] (K)	father's sister
19	*atyerrey* [ɐˈcɛɾɪ] (K), *atyey* [ɐˈcɪ] (C)	*(ay)tey-aytey* [ˈtɪjæ̱ʲˈtɪ] (K) [æ̱ᶦʲˈtɪjæ̱ʲˈtɪ] (K,ALY) *tyey-tyey* [ˈcɪcɪ] (C)	younger sibling

3.2.2 *Syllable reduplication*

Reduplication of the first CV is another common means of forming words in ABT. However, if the vowel is /ə/ ([ə] or [ʊ]) and there is a subsequent full vowel ([ɐ] or [ɪ]) in the word, then it is the full vowel that reduplicates, as in (1) and (6) in Table 14. With initial-vowel deletion and the various segmental changes discussed in §2, the ABT words formed through syllable reduplication are shown in Table 14.

24. Exact realization of final vowel is uncertain.

Table 14. Syllable reduplication as a means of word formation in ABT

Possible source word	ABT	Gloss
1 *atyewarley* [ɐˈcwaˌlɪ], [ɐˈcɯwɐˌlɪ] (K)	*tyatya* [ˈcɐcɐ] (K)	mother's father
2 *kart* [ˈkɐˌʈə] (C)	*kaka* [ˈkɐkɐ]	inedible, rubbish
3 *tyew-* [ˈcɯwə], [ˈcɯː] (onamatapoeic)	*tyew-tyew* [ˈcɯːcɯː] (K)	traditional healer
4 *war* [ˈwaˌɻə] (K)	*wawa* [ˈwɐwɐ]	hot, fire, sun
5 [ˈmɐmə] from Eng "mum" or possibly *amey* [ɐˈmɪjə], [ɐˈmɪ] (A)	*mama* [ˈmɐmɐ]	mother
6 *anherrey* [ɐˈn̪eɾɪ]	*nhey-nhey* [ˈn̪ɪn̪ɪ] (ARR)	mother-in-law
7 *inya* [ɪˈɲɐ], [ɪˈᶜɲɐ] (K)	*nyanya* [ˈɲɐɲɐ]	food

There are also unique ABT lexemes that adhere to this word structure such as *yaya* [ˈjɐjɐ] "sister", *kaka* [ˈkɐkɐ] "brother", as well as borrowings from English such as [ˈtɐtɐ] for "go", [ˈpæ͡ɪpæ͡ɪ] for "sleep" and [ˈlɐlɐ] for "sing".

3.2.3 *Other types of reduplication*

Much of the unique ABT lexicon contains words of a disyllabic reduplicated structure that end in a closed syllable. These are shown in Table 15. In some cases it appears that the VC rhyme of the source form is suffixed to the CVC lexical base (examples (1), (2), (6) and (7)). This is most clearly seen in example (7), where the coda and onset of the stressed syllable differ.

Table 15. Rhyme reduplication in ABT

Possible source (cf. SA form if different)	ABT	Gloss
1 *amey* [ɐˈmɪjə], [ɐˈmɪ] (A) or [ˈmɐmə] from Eng "mum" cf. *arrengkw* [ɐˈɾʊŋgʷa] (K)	*mamam* [ˈmɐmɐm] (K)	mother
2 *artartey* [ɐˈʈɐˌɪ] (C)	*tartart* [ˈtɐˌʈɐˌʈ] (C)	mother's father
3 from Eng "pa" cf. *arlwey* [ɐˈlwɪ] (K) *akngey* [ɐˈkŋɪ] (A)	*papap* [ˈpɐpɐp] (K)	father
4 cf. *aperley* [ɐˈpəˌlɪ], *aperl-aperl* [ɐˈpəˌlɐˈpəˌlə] (ARR)	*(a)papap* [ˈpɐpɐp], [ɐˈpɐpɐp] (ARR)	father's mother[25]
5 way of calling dog cf. *alek* [ɐˈləkə] (K) *arengk* [ɐˈɻəŋgə] (ALY) *akngwely* [ɐˈᵏŋʊʎə] (ARR,C)	*tywetywety* [ˈɔuɔuɔ]	dog, animal
6 Southern Boobook's call "*kwerrkwerrk*" [ˈkʊɾˈkʊɾkə]	*kwekwek* [ˈkʊkʊk]	monster, devil
7 *arlkarl* [ɐlˈkɐˌlə] (K)	*karlarl* [ˈkɐˌlɐˌl]	cold

25. The word *(a)papap* is discussed in Henderson (1998:248).

The name of the ABT register also has this word structure, *thathath* [ˈt̪ɐt̪ɐt̪], which is an onomatopoeic word for infants' speech (compare English "gu-gu" or "ga-ga"). A common structure for BT forms is therefore CVCVC. Another ABT word that adheres to this structure is *kamern* [ˈkɐmən̪] "mother's brother" (C), which is also an SA word in some Arandic varieties (see Table 6, example 15).

3.2.4 *Consonant harmony*

Other unique ABT words are disyllabic, with each syllable containing the same consonant onset but a different vowel (Table 16). A comparison with the SA forms shows that these ABT terms are not simply the result of regular word formation processes. The possible segmental origins of these ABT terms are discussed in §4. We note, however, that both the CV reduplicated forms discussed in the previous section, and the "consonant harmony" forms shown here, are common in child speech (e.g. Pater & Werle 2003).

Table 16. Consonant harmony in ABT terms

Possible source (cf. SA form if different)	ABT	Gloss
1 *kwaty* [ˈkʷɐcə] (A) cf. *arntwa* [ɐnˈd̪wɐ], [ˈɐɳd̪wɐ] (K)	*kweka* [ˈkʊkɐ] (K)	water
2 cf. *wey* [ˈwɪjə] (K) *ker* [ˈkəɻə] (A)	*tyetya* [ˈcɪcɐ] (K,ALY)	meat
3 (unknown) (A)	*tyetya* [ˈcɪcɐ], [cɪc], (ARR)	naughty[26]
4 cf. *ngkerrk* [ˈŋgərkə] (K,ALY)	*mima* [ˈmɪmɐ] (K,ALY)	sore
5 from English "poo" or "poop" cf. *atna* [ɐˈtnɐ] (K)	*pwepey* [ˈpʊpɪ], [ˈpʊpʊ]	poo
6 onomatopoeia for noise that a baby makes	[ˈcɐcɪ] (C)	baby

3.3 Truncation of polysyllabic words to a foot

Words of three or more syllables tend to be truncated to a disyllabic foot in ABT. This is shown in Table 17. The initial (stressed) CV syllable is typically preserved, whereas the nature of the other syllable varies depending on the segmental content of the other syllables. In the multimorphemic word "nanny goat" in (7) the second morpheme is omitted and the initial disyllabic form reduplicated. The truncation of (2), a high frequency word, to VCV is discussed in §3.1. Children learning many languages tend to truncate long words to two syllables in early speech (cf. Demuth 1996; Demuth, Culbertson & Alter 2006). Again, this may be the motivation (or source) for some of these ABT words.

26. This form documented by Henderson (1998: 247).

Table 17. Syllable elision in polysyllabic words in ABT

	Source form	ABT	Gloss
1	*waylpel* [ˈwæɻlpələ] (K)	*wapey* [ˈwɐpɪ] (K)	non-Aboriginal person
2	*apey(-ak-el)* [ɐˈpɪjɐkəl̪ə] (K)	*apey* [ˈɐːpɪ]	nothing
3	*arnawerr* [ɐˈɳɐwərə] (K)	*nawey* [ˈnɐwɪ] (K)	father's elder brother
4	*atyewarley* [ɐˈcʊwɐlɪ], [ˈcwaɭɪ] (K)	*tyatya* [ˈcɐcɐ] (K)	mother's father
5	*kwementyay* [ˈkʊməˈɳcæɻ]	*kwentyay* [ˈkʊɳcæɻ](C)	respect name
6	*kwelteringk* [ˈkʊldɻɪŋgə] (from Eng "cool drink")	[ˈkʊɲɟɪŋg]	soft drink
7	[ˈnɐnɪˈkʊtə] (from Eng "nanny goat")	*naney-naney* [ˈnɐnɪˈnɐnɪ]	goat

4. Unique BT vocabulary

This section considers the unique ABT lexicon in terms of its similarity to WBT and the possible origins of these words.

4.1 Shared vocabulary between WBT and ABT

Despite the different vocabulary in the standard registers, much of the unique BT vocabulary is almost identical in Warlpiri and Arandic. Table 18 shows BT terms common to both Warlpiri and one or more Arandic language, putting aside minor differences in vowel quality and syllable structure. These often replace SA equivalents that often have dispreferred sounds (rhotics, apicals, laterals, prestopped nasals and consonant sequences), dispreferred word structures (initial vowels, final schwas, words of more than a foot) or more specific, complex meanings. Note that the BT kin terms in Table 18 cover a broader range of kin than their SW and SA equivalents.[27]

In some instances the same phonetic form of the ABT word exists in Arandic and Warlpiri but their meanings differ. For example [ˈcɐcɐ] means "mother's mother" in WBT (Laughren 1984:85) but "mother's father" in Kaytetye BT. In Kaytetye BT "mother's mother" is [ˈɲɐɲɐ], a form which also means "food" in WBT and ABT.

27. Laughren (1984:80–87) discusses the semantic simplifications of WBT terms. Many of these are also found in Central Anmatyerr and Kaytetye, though a discussion of these is beyond the scope of this paper.

As in Warlpiri (Laughren 1984: 81), the unique ABT terms refer to kin, animals, mythical evil beings, food, inedible things and cars. Arandic has an additional term *mima* [ˈmɪmɐ] "sore" (example 4 in Table 16). Some of this vocabulary is even more widespread. Glass and Hackett (2003: 465) document *tjuu-tjuu* as BT "dog" in some Western Desert languages (see also Henderson 1998: 247); and Jones and Meakins (2013) report *nyanya* "food" in Gurindji BT.

Table 18. Shared BT lexicon in Warlpiri and Arandic (excluding English source words)

	BT terms common to Warlpiri and Arandic	**SA**	**SW**	**Gloss**
1	*papa* [ˈpɐpɐ] (W,C) *papap* [ˈpɐpɐp] (K)	*arlwey* [ɐˈlwɪ] (K) *akngey* [ɐˈᵏŋɪ] (A)	*kirdana*	father
2	*mama* [ˈmɐmɐ] (W,C) *mamiyi* [ˈmɐmɪji],[ˈmamɪ](W) *mamam* [ˈmɐmɐm] (K)	*arrengkw* [ɐˈɾʊŋgʷə] (K) *amey* [ɐˈmɪ] (A)	*ngati*	mother
3	*tartart* [ˈtɐʈɐʈ] (C) *tartarta* [ˈtɐʈɐʈɐ] (W) *tyatya* [ˈcɐcɐ] (K)	*artartey* [ɐˈʈɐʈɪ] (C) *atyewarley* [ɐˈcʊwɐlɪ](K)	*jamirdi*	mother's father
4	*yaya* [ˈjɐjɐ] (A, K) *yayi* [ˈjɐji] (W)	*arrerey* [ɐˈɾəɻɪ] (K) *angkwerey* [ɐˈŋgʊɻɪ] (A)	*kapardi* *ngawurru*	sister
5	*kakey* [ˈkɐkɪ] (A, K) *kakiyi* [ˈkɐkɪji] (W)	*alkerey* [ɐˈlkəɻɪ] (K) *kely* [ˈkɪʎə], *kak* [ˈkɐkə](C)	*papardi* *kukurnu*	brother
6	*tywetywety* [ˈcʊcʊc] (C, K) *jujuju* [ˈcʊcʊcʊ] (W)	*alek* [ɐˈləkə] (K) *arengk* [ɐˈɻəŋgə] (ALY) *akngwely* [ɐˈᵏŋʊʎə] (ARR,C)	*maliki*	dog, animal
7	*apa* [ˈɐpɐ] (C,W) *kweka* [ˈkʊkɐ] (K, ALY)	*kwaty* [ˈkʷɐcə] (A)	*ngapa*	water
8	*nyanya* [ˈɲɐɲɐ] (A, K, W)	*inya* [ɪˈɲɐ] (K)	–	food
9	*kaka* [ˈkɐkɐ] (A, K, W)	*kart* [ˈkɐʈə] (C) *atna* [ɐˈᵗnɐ] (K)		excrement
10	*pumpum* [ˈbʊmbʊm] (A,K,W)	*mwetek* [ˈmʊtəkə]	*mutuka*	car, truck
11	*kuuku* [ˈkʊːkʊ] (W) *kwekwek* [ˈkʊkʊk] (C, K)	*rlwaylp* [ʊˈlwæɻ̆ʲlpə] (K) *ngkekern* [ˈŋgəkəɳə] (C)	*janpa*	evil being

4.2 Source of the unique BT terms

Much of the unique ABT words can be explained as an Arandic, Warlpiri or English word, or onomatopoeia that has undergone one or more of the word formation processes discussed in §3. Only one ABT form [ˈmɪmɐ] (K, ALY) "sore", which is also a respect register word in Kaytetye (Turpin & Ross 2012: 476), has no

possible source that we are aware of.[28] It may be that many of the widely attested BT terms in Table 18 have diffused over a wide area.

For example, the BT words for "father" and "mother" may have their origins in English and this term diffused over a wide area. BT [ˈkɐkɪ] "brother" attested in all Arandic languages and Warlpiri may have its origins in an Aboriginal language. It may be derived from SA *kely* [ˈkəʎə] (C), *alkerey* [ɐlkˈəɻɪ] (K) "older brother" or SW *kukurnu* "younger brother" given the constraints on initial vowels, rhotics, laterals and consonant clusters, as well as the tendency for syllable reduplication in BT. Once formed, it may have spread across the region.

Some ABT words clearly have their origins in Standard Warlpiri. For example, SW *ngapa* [ˈŋɐpɐ] "water" is no doubt the source of BT *apa* [ˈɐpɐ] "water", which is used in both Central Anmatyerr and Warlpiri; and SW *kalya-kalya* [ˈkɐʎɐˈkɐʎɐ] "wife's brother" is borrowed as the BT term for "spouse" in neighbouring Kaytetye.

Conversely, some ABT terms seem to have made their way into SA. BT *tartart* [ˈtɐʈɐʈ] is Standard in Central Anmatyerr, whereas in other languages it is *artartey* [ɐˈʈɐʈɪ] and *atyemey* [ɐˈcəmɪ]. BT *aytey-aytey* [æ͡ɪʲtijæ͡ɪʲti] "younger sibling" is documented as Standard in Alyawarr, whereas other languages have *atyey* and *atyerr*. Arrernte has *kakey* "brother" as both BT and SA while other Arandic languages have a different SA form. Even within the one language, some ABT kin terms are used by adults as a fond way of addressing an elder relative. For example SA *atyewarley* [ɐˈcʊwɐlɪ], [ɐˈcwɐlɪ] "mother's father" (K) has an ABT term *tyatya* [ˈcɐcɐ]; however' *tyatya* is often used by adults to address their mother's father instead of the more formal *atyewarley*. It is possible that the use of ABT kin terms as terms of affection for older relatives has led to many of them being adopted as the SA form in some languages.

Another source of ABT terms is onomatopoeia. Once formed, these terms may also have spread to other languages. BT *tywetywety* [ˈcʊcʊc] "dog" is attested in all Arandic languages, Warlpiri and Western Desert. A possible onomatopoeic source is documented by Glass and Hackett (2003: 465) in Western Desert languages, where a repeated [cʊ] is the exclamation for calling a dog.

Onomatopoeia also seems to be the likely source of BT *kwekwek* [ˈkʊkʊk] "evil being". Arandic speakers say *kwerrkwerrk* [ˈkʊɾkʊɾk] is the sound made by the Southern Boobook, (which is also its name in some Arandic languages) which is associated with *kurdaitchas* (traditional avengers). ABT *tyew-tyew* [ˈcʊːcʊː] "traditional healer" also has its origins in onomatopoeia. This word is said to be based on the spitting sound made by traditional healers when they perform healing

28. ABT *mima* contrasts with SA *ngkerrk* [ˈŋgəɾkə] (K) and *utyen* [ʊˈcəɳə] (A).

ceremonies. This action is referred to in SA by the ideophone *tyew* or *tyew-tyew* (repetitive), a semantically opaque morpheme that compounds with the inchoative in various Arandic languages to mean "perform traditional healing".[29]

In some cases both onomatopoeia and a Standard word provide possible sources of a BT term. For example, BT [ˈɲɐɲɐ] "food" can be seen as the result of initial vowel deletion and reduplication of Kaytetye *inya* "food" or a reduplication of an onomatopoeic sound for eating [ɲɐ]. The widespread distribution of [ˈɲɐɲɐ] "food" in languages that do not have the word *inya*, including all other Arandic languages, Warlpiri and Gurindji, mean a very widespread borrowing would have had to occur. The onomatopoeic sound as the source means that the ABT term could have been created independently in these languages.

Onomatopoeia is also the source of many BT animal names, as evidenced from Kaytetye and Central Anmatyerr ABT *thep-thep* [ˈcɪpcɪp] "bird" *wangk-wangk* [ˈwɛŋkwɛŋk] "pig", *pak-pak* [ˈpɛkpɛk] "frog", *meyaw-meyaw* [ˈmɪɐwmɪɐw] "cat" and *mew-mew* [ˈmʊmʊ] "cow". In addition, an alveo-palatal click is ABT for "kangaroo", based on the noise joeys make, and a bilabial click is "milk" in Kaytetye ABT. Jones and Meakins (2013) show onomatopoeia as a productive source of many Gurindji BT words and Ferguson (1964) notes its prevalence in BTs cross-linguistically.

English is also one of the most productive sources of new ABT terms. The large number of English source words currently in use may be due to language change. Arandic languages are highly endangered and in some places Aboriginal English is rapidly replacing the Arandic language. English also provides a vocabulary free of some of the segmental contrasts typically avoided in BT. Amongst the Warlpiri, Laughren (1984: 87) notes that the "borrowing of English terms appears to be a common feature of adult speech directed at children." Arandic languages also borrow from English, as well as other languages, to create unique vocabulary in the respect register and song register as well (Turpin & Green 2011).[30]

5. Discussion

This paper has made a first pass at outlining some of the major segmental and word formation characteristics of ABT. A more comprehensive analysis of the

29. Alternatively it may have its origins in English "shoo", also onomatapoeiac.

30. Consider Arandic "*toot-toot*"*-ayerr* "car", a respect word based on the onomatopoeic English vocalisation of a car horn combined with the respect register marker morpheme *-ayerr* (Turpin & Green 2011: 313).

phonological systems of these languages, complete with acoustic and articulatory data, would provide a more detailed basis on which to understand the phonological mapping between the probable source forms and the ABT "outputs". Nonetheless, the preliminary analysis provided here suggests that the phonological processes underlying ABT are similar to many other forms of child-directed speech found elsewhere in the world.

In a survey of BT in six different languages/cultures, Ferguson (1964: 105) reported the following common characteristics:

> (1) intonational and paralinguistic phenomena which occur with normal language as well as with other baby-talk material; (2) morphemes, words, and constructions modified from the normal language; and (3) a set of lexical items peculiar to baby talk.

With respect to phonological and morphological aspects of BT, Ferguson (1964) noted the following common segmental and word formation processes:

- Simplification of consonant clusters: English *stomach* > *tummy.*
- Basic, simple, "unmarked" segments.
- Part- and whole-word reduplication, yielding unmarked, CVC(V) structures.
- Absence of affixes (sometimes referred to as "telegraphese").
- Diminutives, CVCV forms, reduplications, e.g. *doggie, kitty, momma, papa.*

We have shown above that many of these processes also occur in ABT, where a limited inventory of segments is used to form primarily trochaic feet ('CVCV or CVC) and reduplications.

With respect to lexicon, Ferguson notes 25–60 special BT items in the languages he surveyed. Most of these belonged to the semantic classes of kin, body parts, and other nouns. The unique ABT discussed in §4 represent a subset of these, drawn mostly from kinship terms and common nouns. It is likely this is an open class, with new forms occasionally being created from various borrowings. For English, such forms include many that are onomatopoeic reduplications, such as animal calls, greetings, and mechanical sounds (e.g. *bow-wow, bye-bye, choo-choo*), and this is attested above for ABT as well. Ferguson (1964) also comments on family-specific lexical BT variation. This is probably due to child-specific phonological processes that are then used by the adult (e.g. English *cheese* > *cheesy*; *rice* > *wuki* – cf. Demuth et al. 2006). Finally, Ferguson (1964) notes that BT forms are also subject to areal diffusion. He suggests the latter may be due to the lack of grammatical incorporation, though these items are well integrated phonologically. This provides a possible explanation for the large number of the unique BT items common across Warlpiri and Arandic.

BT is also often characterized by exaggerated intonation, slower speaking rate, and expanded vowel space, at least in English (see Song, Demuth & Morgan 2010 for review). It has also been found that mothers' speaking rate speeds up between the their children's ages of 1 and 3 (Ko 2012), presumably because these caregivers sense that children's language comprehension (and production) increases during this period. ABT shows similar exaggerated pitch, and lexical and segmental differences are found in early and late ABT, though a thorough investigation of the prosodic characteristics ABT remains for future research.

It is reported that BT is not universal. Schieffelin (1990) reports the lack of BT registers (and lack of parental talk to infants and young children in general) amongst the Kaluli in Papua New Guinea. Pye (1986) also reports a lack of BT amongst the Maya K'ich'e of Guatemala. However, it is possible that older siblings and other caregivers may engage in some sort of BT in these societies. This is certainly the case in the southern African country of Lesotho, where infants are engaged in triadic conversations with adults and older siblings from birth (Demuth 1986). This is often delivered with high pitch, and includes simplifications such as omissions of word-initial syllabic nasals (*ntate* [n̩tatɛ] > [tatɛ] "father") and reduction of glides in the onset (*ŋgoana* [ŋwanɑ] > *nana* [nanɑ] "child"). Note that both processes also result in disyllabic, (partially) reduplicated feet. Interestingly, these children's early speech, as well as that of children learning many languages around the world, exhibits many of the same processes found in BT forms, including cluster simplification, the prevalence of stops, gliding of onset liquids, vocalization of final liquids, reduplication, and omission of word-initial unstressed syllables, often resulting in forms that are maximally a disyllabic foot (Demuth 2011). Given that many of the phonological processes described for ABT are similar across languages, and reflect many of the same phonological processes found in children's early speech, it is possible that BT may be a partial reflection of the phonologically restricted forms typically used by young children, as suggested by Arandic speakers. This is therefore a possible synergistic source for many BT forms across societies, where BT then becomes formalized into a special speech register to greater or lesser degrees across communities.

6. Conclusion

This paper has outlined the phonological characteristics of Arandic Baby Talk, which shows remarkable similarities to Warlpiri Baby Talk (Laughren 1984). However, the phonological and word formation processes involved in forming ABT forms from SA differ from those in Warlpiri due to their different phonologies. Many of the phonological process that give rise to the ABT words are common in early child speech

(Demuth 2011). For example, at the segmental level, laterals and rhotics are known to be a challenge for learners across many languages, and are often acquired late (Smit 1993). It is probable that the large number of coronal contrasts found in both Warlpiri and Kaytetye are also difficult for young children to articulate (and possibly perceptually), leading to the collapse of these contrasts in both WBT and ABT. Many of the simple ABT syllable and word structures are also found in early child speech, with word-final (coda) consonants often missing, and word-internally consonant sequences simplified. Children's early words are often truncated to a (reduplicated) disyllable as well. Thus, the ABT words discussed here may well be formed from the same types of segments and word structures that children learning these languages use in their early speech. To the extent that the perceptual cues to some of the many alveolar places of articulation may be subtle, perhaps ABT also facilitates comprehension on the part of the child. In this regard it would be interesting to know more about the prosodic characteristics of ABT (pitch, stress, speaking rate, vowel space), and how this compares with SA. Collection of child perception and production data would also illuminate the nature of children's early language capacities, and shed further light on the forces that may have shaped ABT.

This paper was inspired by Mary Laughren's classic 1984 paper on BT in Warlpiri. It is therefore of great interest to see the number of parallels between the segmental and word formation processes found in ABT and neighbouring WBT. How widespread these are is obviously an area for further research.

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