Typology of Comparatives

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Abstract. It is well-known that an adjective is not a universal part of speech. As pointed out in the previous researches, many oceanic languages do not have a morphologically distinguished adjective class. The only criteria which distinguish adjectives from verbs and nouns could be whether they appear in comparative construction or not. However, even comparative construction is not universal. Whereas most languages have a specific morpheme to construct comparatives like inflection, some languages do not. In this paper I investigate various languages in the Pacific Asia region and discuss the difference in comparative construction in the framework of formal semantics. I suggest two parameters to distinguish the four language groups and propose a new typology of comparative construction.

Keywords: Oceanic languages, Comparatives, Formal semantics, Typology

1. Introduction

It is well-known that many oceanic languages have no adjective class which is distinguishable from noun and verb classes (Wetzer, 1996). The only criteria which distinguish adjectives from nouns and verbs could be comparative constructions (Dixon, 2004). However, comparative construction is not universal. Some languages in Papua New Guinea do not have any comparative morpheme or any comparative-specific structure. In this paper I focus on the comparative forms of various languages in the Pacific Asia region and suggest a new typology of comparatives in the framework of formal semantics.

 The structure of the paper is as follows: in section 2, I summarize the previous studies on semantics of comparatives and define the denotation of adjectives; in section 3, I show the data from various languages in the Pacific Asia region and classify them into four groups depending on the morphological/syntactic markedness; in section 4, I show how to analyze each type of comparative construction in the framework presented in section 2; in section 5, I show that two parameters are relevant to the classification of adjectival systems.

2. Semantics of Comparatives

The denotation of an adjective is property, i.e. an expression of type $\langle e,t \rangle$. In comparative construction, however, adjectives need to be abstracted over degrees, because what is compared is the degree of property of more than one object. I call this process degree abstraction and define the degree abstraction operator as follows:

1) Degree Abstraction operator Π is a function from expressions of type $\langle e,t \rangle$ to $\langle e \langle d,t \rangle \rangle$
   $$\Pi_{\langle\langle e,t\rangle, \langle e,\langle d,t\rangle\rangle\rangle} = \lambda A_{\langle e,t\rangle}\lambda x_{\langle e\rangle}\lambda d_{\langle d\rangle} [R_A(d)(x)]$$
   where the domain of type $\langle d \rangle$ is a set of degrees and R_A is a function which relate objects to degrees on the scale of A.

Ex. $\lambda x_{<e>} [tall(x)] \rightarrow \lambda x_{<e>}\lambda d_{<d>} [R_{tall}(d)(x)]$

After an adjective undergoes the process of degree abstraction, we obtain a function from individuals to a set of degrees. An adjective *tall* now means a set of degrees which the individual x has on the scale of tallness. However, this procedure is not enough for an adjective to be comparative. When we compare two sets of degrees, we need to pick up the maximal degree in each degree set. This process is conducted by the maximization operator 'MAX' (Rullmann, 1995).

2) $MAX (\lambda d_{<d>} [R_A(d)(x)]) = \iota d [R_A(d)(x)]$

Degree abstraction and maximization work together with comparative morphemes to construct comparatives. For example, English comparative morpheme *–er* is defined as (3) (Kennedy, 1999)[1]. Each argument of *–er* has to be abstracted over degrees and maximized.

3) Definition of comparative morpheme
   $\|MORE(MAX(D2))(MAX(D1))\| = 1$ iff $MAX(D1) > MAX(D2)$

   Ex. $\|Bill$ is taller than $John\|$
   $= MORE (MAX(\lambda d_{<d>} [R_{tall}(d)(John)]))(MAX(\lambda d_{<d>} [R_{tall}(d)(Bill)]))$
   $= \iota d_{<d>} [R_{tall}(d)(Bill)] > \iota d_{<d>} [R_{tall}(d)(John)]$

3. Four Types of Comparative Forms

Investigation on a wide variety of languages reveals that there are at least four types of comparative constructions: Enlish-type, Chinese-type, Japanese-type and Dom-type. The former three languages have adpositions to introduce standards of comparison, while Dom-type languages has none. In other words, Dom-type languages cannot describe comparison in one sentence, as there is no way to introduce a standard of comparison into adjectival construction. The sense of comparison is described by coordination of positive and negative adjectives. Other three languages are different in morphological markedness of adjectives. English-type languages mark comparative form and Chinese-type languages absolute form, while Japanese-type languages do not have any morpheme or word to distinguish aboslute and comparative.

Table 1: Typology of Comparative Forms

	The standard of comparison is introduced by...	morphological markedness
English-type	adpositional phrase	comparative
Chinese-type	adpositional phrase	absolute
Japanese-type	adpositional phrase	none
Dom-type	coordination	none

A large number of languages belong to English-type or Japanese-type, while only a few appear as examples of Chinese and Dom-type languages.

4) **English-type**: absolute form as basic
   English, Karo Batak, Madurese, Sundanese, Semelai, Chamorro, ...
5) **Chinese-type**: comparative form as basic

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[1] The order of D1 and D2 is different from the original suggestion by Kennedy (1999). Following Bresnan (1973), Heim (2000) and Bhat & Pancheva (2004), I assume that comparative/absolute morphemes are first combined with degree clauses.

Chinese, Qiang
6) **Japanese-type**: no morpheme
Japanese, Worora, Muna, North-East Ambae, ...
7) **Dom-type**: juxtaposing a positive sentence and a negative one
Dom, Korowai, Sinaugoro, Nabak

3.1. English-type Adjectives

In English-type languages, an adjective designates an abolute quality so that it has to undergo morphological change. For example, English absolute form is bare adjective while comparative form is adjective+*er*.

8) a. Bill is tall.
   b. Bill is taller than John.

This group of languages includes Karo Batak (*-en*), Madurese (*-an*), Semelai (*ra* -) and Chamorro (*-ña*). The comparative form of each language is as follows: [2]

9) Karo Batak
   Ia Gegeh-en asang aku.
   he strong-er than   I
   'He is stronger than me.'

10) Madurese
    Hasan sənəng-an katembang Ali.
    Hasan happy-er   than   Ali
    'Hasan is happier than Ali.'

11) Semelai
    ŋaŋ,   cim ra -tʰəy   t m kl ŋk ŋ.
    enggang hornbill bird more-be.big from pied-hornbill
    'The enggang hornbill, (it's) bigger than the pied-hornbill.'

12) Chamorro
    Dikike   ña si Rosa kinu si Rita.
    Small-er   the Rosa than the Rita
    'Rosa is smaller than Rita.'

3.2. Chinese-type Adjectives

Chinese-type adjectives stand in sharp contrast to English-type ones. In Chinese, adjectives are inherently comparative and need to be modified by the degree adverb *hen* 'very' to describe absolute qualities.

13) Chinese
    a. Zhangsan hen shuai.
       Zhangsan very cool
     'Zhangsan is cool.'
    b. Zhangsan bi Lisi shuai.

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[2] The following languages might also have English-type adjectival system: Indonesian (*lebih*), Baumaa Fijian (*ca'e* 'up, more'), Sundanese (*leuwih* 'more'), Tinrin (*siwai--nai* 'comparative--superior'), Māori (*ake* 'up'). These languages utilize adverbs to describe comparison. They might be in pre-gramaticalized stage of comparative morphemes.

Zhangsan than Lisi cool
'Zhangsan is cooler than Lisi.'

Only a few languages have Chinese-type adjectival system. Qiang is another example of this type. The adverb *wa* 'very' clarifies the absolute meaning in (14b), while a bare adjective appears in comparative construction (14c).

14) Qiang
    a. The: tiwi.
      3SG tall
      'He is tall/taller.'
    b. The: tiwi-wa.
      3SG tall-very
      'He is very tall.'
    c. The:-ŋuə i qa-sə   ba- a.
      3SG-TOP 1SG-than big-1SG
      'He is bigger than me.'

3.3. Japanese-type Adjectives

Japanese-type adjectives do not undergo any morphological change to distinguish between absolute and comparative. The only difference between absolute and comparative is whether there is a standard of comparison in the sentence or not. In the following pair of sentences, the adjective *wakai* 'young' appears in both absolute and comparative sentences without undergoing any morphological change.

15) a. Taro-wa wakai.
      Taro-TOPIC young
      'Taro is young.'
    b. Taro-wa Jiro-yori wakai.
      Taro-TOPIC Jiro-than young
      'Taro is younger than Jiro.'

Worora, Muna, North-East and Ambae belong to this group. The standards of comparison are introduced by *man'daga* in Worora, *bhe* in Muna, and *dene* in North-East Ambae respectively. [3]

16) Worora
    Kum'baiu 'inia man'd ga Pu'nauera.
    Kumbaiu good than   Punauera
    'Kumbaiu is better than Punauera.'

17) Muna
    No-bhala anoa bhe inodi
    3SG-big he   with I
    'He is bigger than I am.'

18) North-East Ambae
    Vanua-ra, bataha u garea u garea u garea dene na vanua-da.

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[3] The following languages might also belong to this class: Fehan dialect of Tetun (*liu* 'go further'), Seediq (*rmabang* 'surpass'), Abun (*wai* 'pass'), Tawala (*lagona* 'surpass'), Jabêm (-*leleq...su* 'surpass') and Sye (*telwog-* 'go past'). These languages use verbs of motion to introduce standard of comparison. They might be in pre-gramaticalized stage of comparative morphemes which add an extra argument to adjectives.

land-their I.reckon TEL good TEL good TEL good from ACC land-our
I reckon their land is much, much better than ours.' TEL=telic

3.4. Dom-type Adjectives

In Dom-type languages, a comparison of degrees is described by a coordination of two sentences, one positive and one negative. For example, in (19b), the first adjective is *bl* 'big' and the second one is the opposite, *kepl* 'small'.

19) Dom
    a. John bl mol-gwe.
       John big be-3SG.-INDICATIVE
       'John is big.'
    b. John bl mol-gwe,   Bill kepl mol-gwe.
       John big be-3SG.-INDICATIVE Bill small be -3SG.-INDICATIVE
       'John is bigger than Bill.'

Although it might seem to be inappropriate to regard this kind of coordination as comparative, if we assume that there is a notion of comparison in every human language, this structure should be analyzed as comparative construction.

Sinaugoro, Nabak and Korowai belong to this group. The adjective in the second sentence can be the negation of the first adjective as in the example of Korowai.

20) Sinaugoro
    Boregaina tu   vanu a bara-na, Saroa tu   kei-na.
    Boregaina TOPIC village big-3SG Saroa TOPIC small-3SG
    'Boregaina is bigger than Saroa.'

21) Nabak
    Pi   imbelaŋaŋ, Ke nugŋaŋ.
    This easy   that difficult
    'This is easier than that.'

22) Korowai
    If-e-kha abül-efè khonggél-khayan waf-e-kha abül be-khonggé-tebo-da.
    This-tr-CONN man-TOPIC big-very that-tr-CONN man Neg-big-be.3SG. REAL-NEG
    'This man is bigger than that man.' tr=transitional sound, CONN=connective

4. Typology of Comparatives
4.1. English-type Adjectival System

In English-type adjectival system, adjectives are not abstracted over degrees nor maximized. They must undergo degree abstraction (23b) and maximization (23c) to be arguments of comparative morpheme.

23) a. $\|\text{Adjective}_E\| = \lambda x_{<e>} [A(x)]$
    b. $\|\Pi(\|\text{Adjective}_E\|)\| = \lambda x_{<e>}\lambda d_{<d>} [R_A(d)(x)]$
    c. $\|\text{MAX}(\Pi(\|\text{Adjective}_E\|))\| = \lambda x_{<e>}\iota d_{<d>} [R_A(d)(x)])$
24) $\|\text{-er}\| = \lambda d'_{<d>}\lambda d_{<d>} [d > d']$
    a. $\|\text{-er than John }\text{~~is tall~~}\| = \|\text{-er}\|(\|\text{John is tall}\|)$
       $= \lambda d'_{<d>}\lambda d_{<d>} [d > d'](\iota d_{<d>}[R_{tall}(d)(John)])$
       $= \lambda d_{<d>}\lambda x_{<e>} [d > \iota d_{<d>}[R_{tall}(d)(John)]]$
    b. $\|\text{Bill is taller than John }\text{~~is tall~~}\| = \|\text{-er than John }\text{~~is tall~~}\|(\|\text{Bill is tall}\|)$
       $= \lambda d_{<d>} [d > \iota d_{<d>}[R_{tall}(d)(John)]](\iota d_{<d>}[R_{tall}(d)(Bill)])$

$$= \iota d_{<d>}[R_{tall}(d)(Bill)] > \iota d_{<d>}[R_{tall}(d)(John)]$$

As shown by '~~is tall~~', the adjective in *than*-clause is usually interpreted as the same one as the main clause, it can be different from the one in the main clause.

25) The door is wider than the table is long.

(25) is well-formed because we can apply degree abstraction and maximization on main clause and *than*-clause respectively. It means both operators are available in syntax in English-type languages.

4.2. Chinese-type Adjectival System

In 3.2, I mentioned that Chinese adjectives are inherently comparative. However, Chinese adjectives are not homogeneous. In this section I first discuss the different types of adjectives and then define the Chinese adjectival system.

Chinese adjectives can be classified into two major groups: simple adjectives and complex adjectives. Simple adjectives are well-known for their 'nouny' behavior: they can modify nouns directly (26) (a noun can modify another noun directly in Chinese). Complex adverbs are known as 'verby', as they take the form of relative clauses when they modify a noun (27).

26) shuai ge
    cool guy
    'cool guy'
27) shuaishuai de   ge
    cool-cool REL guy
    'very cool guy'   REL=relative clause marker

Observing several different behaviors of the two types of adjectives, Huang concluded that simple adjectives are expressions of type <e>, while complex adjectives are of type <e,t> (Huang, 2006). However, this conclusion is not attested by the most basic criterion which distinguishes the two types of adjectives, i.e. (26)-(27). As nouns are expressions of type <e,t> and modification is possible by generalized conjunction (Partee and Rooth, 1983), simple adjectives may well be expressions of type <e,t>. Huang's conclusion cannot explain why only simple adjectives can appear in comparative construction either.

28) Zhangsan bi   Lisi shuai.
    Zhangsan compare Lisi cool
    'Zhangsan is cooler than Lisi.'
29) *Zhangsan bi   Lisi shuaishuai.
     Zhangsan compare Lisi cool-cool
    'Zhangsan is much cooler than Lisi.'

I assume that simple adjectives in Chinese are abstracted over degrees and maximized in lexicon as (30a). They are already prepared for comparison, hence they sound natural in comparative construction. On the other hand, complex adjectives go too further. They not only designate the property but also mention that the degree to which the object is cool exceeds the usually expected degree. Hence they cannot take another standard of comparison.

30) a.$\|Adjective_{SIMPLE}\| = \lambda x \iota d[R_A(x)(d)] \rightarrow \lambda d' \lambda x \iota d[R_A(x)(d)] > d'$
    b.$\|Adjective_{COMPLEX}\| = \lambda x \iota d[R_A(x)(d)] >$ the usually expected degree

Another important point is that degree abstraction is applied in lexicon. When degree abstraction is applied to an adjective in lexicon, the abstracted degrees must be on the scale of the adjective. This is the reason why the counterpart of (25) is not well-formed in Chinese. Chinese native speakers do not consider "long" and "wide" are on the same scale even if they describe degrees on the same dimension.

31) *Zheige men bi [neige zhuozi chang] kuan.
       this door compare that table long wide
      'This door is wider than that table is long'

Let us now see how simple adjectives behave in absolute construction. As mentioned above, a simple adjective cannot construct a predicate in Chinese. It needs the support of a degree adverb like *hen* 'very' to be absolute.

32) ?Zhangsan shuai.
       Zhangsan cool
      'Zhangsan is cooler.'
33) Zhangsan hen shuai.
       Zhangsan very cool
      'Zhangsan is cool.'

As simple adjectives are already abstracted over degrees and maximized, they tend to be interpreted as comparative (34). Degree adverb *hen* 'very' takes the adjective and fills the argument of standard degree, makes the adverb to be absolute.

34) $\|Zhangsan\ shuai\| = \iota d_{<d>}\ [R_{cool}(d)(Zhangsan)] > ?$
35) a. $\|hen\| = \lambda A_{<d,t>}\ [A(c)]$ c = the standard degree given by the context
      b. $\|hen\ shuai\| = \|hen\|(\|shuai\|)$
                  $= \lambda A_{<d,t>}\ [A(c)](\lambda d_{<d>}\ [\iota d_{<d>}[R_{cool}(d)(x)]\ > d])$
                  $= \iota d_{<d>}\ [R_{cool}(d)(x)] > c]$

4.3. Japanese-type Adjectival System
Japanese-type adjectives can occur both in absolute and comparative construction without morphological change. Hence we can assume that maximization is not lexical, as lexical maximization usually induce comparative reading as mentioned above. On the other hand, degree abstraction is lexical in Japanese-type languages as argued in Beck et al (2004). The most striking evidence is the ill-formedness of subcomparatives. Since degree abstraction is applied in lexicon, adjectives in different dimensions cannot be compared in Japanese.

36) *Kono doa-wa [ano tsukue-ga nagai]-yori hiroi.
       this door-TOP that table-NOM long than wide
      'This door is wider than that table is long'

Another important aspect of their claim is the way *yori*-clause is interpreted. *Yori*-clause is different from English than-clause in that it provides a clue to obtain the standard of comparison but does not provide the exact degree to compare with. According to their analysis, the standard of comparison is obtained by pragmatic inference.

In sum, the denotation of Japanese adjectives in comparative construction is as follows:

37) a. $\|Adjective_J\| = \lambda x_{<e>}\lambda d_{<d>}\ [R_A(d)(x)]$
      b. $\|MAX((\|Adjective_J\|))\| = \lambda x_{<e>}\iota d_{<d>}\ [R_A(d)(x)]$
38) $\|Taroo\text{-}wa\ Jiroo\text{-}yori\ wakai\| = \iota d_{<d>}\ [R_{young}(d)(Taroo)]) > c$

where c is provided by *yori*-clause.

4.4. Dom-type Adjectival System

In Dom-type languages, comparative construction consists of positive and negative adjectives on the same dimension. We can formalize the construction as (39). In this construction neither degree abstraction nor maximization seems to be relevant. Instead, they use abstraction over properties (40) and conjunction (41).

39) $\|Adjective_D\|$ & $\|\sim Adjective_D\|$

40) $A(x) = \lambda P_{<e,t>}\lambda x_{<e>} [P(x)] \ni A$

41) $A(x)$ & $\sim A(y)$

  $= \lambda x_{<e>} [A(x)]$ & $\lambda y_{<e>} [\sim A(y)]$

  $= \lambda P_{<e,t>}\lambda x_{<e>} [P(x)] \ni \|A\|$ & $\lambda Q_{<e,t>}\lambda y_{<e>} [Q(y)] \not\ni \|A\|$

  $= \{P: x \text{ has property } P\} \ni A$ & $\{Q: y \text{ has property } Q\} \not\ni A$

42) $\|John \text{ is big, Bill is small}\|$

  $= \{P: \text{John has a property } P\} \ni \|big\|$ & $\{Q: \text{Bill has a property } Q\} \not\ni \|big\|$

(42) means that the set of properties that John has includes the property 'big' and the set of properties that Bill has does not include the property 'big'. Dom-type adjectives are defined as (43), in which neither degree abstraction nor maximization is available al through lexicon and syntax.

43) $\|Adjective_D\| = \lambda x_{<e>} [A(x)]$

5. Conclusion

In this paper I classified languages into four groups depending on the presence/absence of adpositional phrases and morphological markedness on adjectives in comparative construction. Availability of degree abstraction and maximization distinguishes these four language types.

Table 2: Typology of Adjectives

	Degree Abstraction	Maximization
English-type	syntax	syntax
Chinese-type	lexicon	lexicon
Japanese-type	lexicon	syntax
Dom-type	none	none

English-type adjectival system can utilize degree abstraction and maximization in syntax, while both of them are only applied at lexical level in Chinese-type adjectival system. As early maximization induces comparative reading, comparative forms in Chinese-type languages are unmarked so that adjectives need 'absolute operator'. In Japanese-type adjectival system degree abstraction is limited to lexical level so that they do not allow subcomparatives, whereas maximization is not obligatory in lexicon so that adjectives can feed both absolute and comparative operator. Dom-type languages utilize a unified strategy to noun conjunction and adjective conjunction, which leads these languages to develop a particular way to express comparative.

References

Bhatt, R., and R. Pancheva. 2004. Late Merger of Degree Clauses. *Linguistic Inquiry* 35(1), 1-45.

Beck, S., T. Oda and K. Sugisaki. 2004. Parametric Variation in the Semantics of Comaprison: Japanese vs. English. *Journal of East Asian Linguistics* 13: 289-344.

Berry, K. and C. Berry. 1999. *A description of Abun: A West Papuan Language of Irian Jaya*. Pacific Linguistics B-115.

Bradshaw, J. and F. Czobor. 2005. *Otto Dempwolff's Grammar of the Jabem Language in New Guinea*. Honolulu:University of Hawai'i Press.

Bresnan, J. 1973. The Syntax of Comparative Clause Construction in English. *Linguistic Inquiry* 4: 275-343.

Crowley, T. 2004. *Bislama Reference Grammar*. Honolulu:University of Hawai'i Press.

Dauies, W. 1999. *Madurese*. Munchen:LINCOM EUROPA,

Dixon , R. M. W. 2004. Adjective Classes in Typological Perspective. In R. M. W. Dixon and A. Y. Aikhenvald eds., *Adjective Classes*, pp 1-49. Oxford University Press.

Dixon, R. M. W. 1988. *A Grammar of Boumaa Fijian*. The University of Chicago Press

England, N. C. 2004. Adjectives in Mam. In R. M. W. Dixon and A. Y. Aikhenvald eds., *Adjective Classes*, pp125-146. Oxford University Press.

Ezard, B. 1997. *A Grammar of Tawala*. Pacific Linguistics (C-137)

Fabian, G., E. Fabian and B. Waters. 1998. *Morphology, Syntax and Cohesion in Nabak, Papua New Guinea*. Pacific Linguistics (C-144)

Harlow, R. 1996. *Maori*. Munchen:LINCOM EUROPA.

Heim, I. 2000. Degree Operators and Scope. In B. Jackson and T. Mathews, eds., *SALT X*, pp. 41-64. CLC Publication, N.Y. Ithaca.

Holmer, A. J. 1996. *A parametric Grammar of Seediq*. Lund University Press

Hunag, S.Z. 2006. Property Theory, Adjectives, and Modification in Chinese. *Journal of East Asian Linguistics* 15:343-369.

Hyslop, C. 2004. Adjectives in North-East Ambae. In R. M. W. Dixon and A. Y. Aikhenvald eds., *Adjective Classes*. Oxford University Press

Kennedy, Christopher 1999 Projecting the Adjective. New York Garland.

Klamer, Marian 1998 *A Grammar of Kambera*. Mouton de Gruyter

Kruspe, Nicole 2004 'Adjectives in Semelai.' In R. M. W. Dixon and A. Y. Aikhenvald (eds.) *Adjective Classes*, pp283-305. Oxford University Press.

LaPolla, R. J. and C. Huang. 2004. Adjectives in Qiang. In R. M. W. Dixon and A. Y. Aikhenvald eds., *Adjective Classes*, pp306-322. Oxford University Press.

Love, J. R. B. 2000. *The Grammatical Structure of the Worora Language of North-Wetern Australia*. Munchen :LINCOM EUROPA.

Macdonald, R. R. and D. Soenjono. 1967. *A student's Reference Grammar of Modern Formal Indonesian*. Georgetown University Press

Muller-Gotama, F. 2001. *Sundanese*. Munchen:LINCOM EUROPA.

Osumi, M. 1995. *Tinrin Grammar*. Honolulu:University of Hawai'i Press.

Partee, B. H. and M. Rooth 1983. 'Generalized conjunction and type ambiguity.' In Bauerle, R., C. Schwarze, and A. von Stechow, (eds.) *Meaning, Use and Interpretation of Language*. Berlin:Walter de Gruyter.

Ramos, V. T. 1971. *Tagalog Structures*. Honolulu:University of Hawaii Press.

Rullmann, H. 1995. *Maximality in the Semantics of WH-Constructions*. Ph.D. thesis, University of Massachusetts.

Sneddon, J. N. 1996. *Indonesian*. Routledge.

Tauberschmidt, G. 1999. *A Grammar of Sinaugoro*. Pacific Linguistics C-143

Crowley, T. 1998. *An Erromangan (Sye) Grammar*. Honolulu:University of Hawai'i Press.

Tida, S. 2006. *A Grammar of Dom Language-A Papuan Language of Papua New Guinea*. Ph.D. thesis, Kyoto University.

Topping, D. M. 1973. Chamorro Reference Grammar. Honolulu:The University Press of Hawai'i

Woolams, G. 1996. *A Grammar of Karo Batak, Sumatra*. Pacific Linguistics C-130

Wetzer, H. 1996. *The Typology of Adjective Predication*. Mouton de Gruyter.

van Enk, J. Gerrit and L. de Vries. 1997. *The Korowai of Irian Jaya*. Oxford University Press

van Klinken. and C. Lumien. 1999. *A Grammar of the Fehan dialect of Tetun: An Austronesian Language of West Timor*. Pacific Linguistics C-155

van den Berg, R. 1989. *A Grammar of the Muna Language*. Ph.D. thesis,