Big and *small* as dimension-less degree modifiers: Evidence from Shantou Teochew

Introduction Previous work has argued that the size adjective *big* can contribute a dimensionless degree reading, in contrast to other dimension adjectives like *long*. In phrases like *big idiot*, for example, *big* is an adnominal degree modifier asserting that the properties of the nominal predicate *idiot* hold to a high degree (Morzycki, 2006, 2009, 2012). A similar proposal can be made for verb phrases like *think big*. In this study we develop new evidence for dimensionless degree functions of size adjective *big* (and *small*) based on the morphosyntax and lexical semantics of Classifier-Marked Adjectives in Shantou Teochew (Southern Min, Sinitic), and propose a novel analysis that draws on Wellwood (2015).

Background In Shantou Teochew, an (Adjectival) Classifier (glossed A.CL) is required with all dimensional (size and shape) adjectives, across adjectival syntactic environments (*dua/soi* 'big/small,' *dun/do* 'long/short,' *gui/oi* 'tall/short,' and *saga/bang/yi/toyi* 'triangular/square/round/oval') (1-a). All other adjectives are ungrammatical with Adjective Classifiers (1-b).

(1) a. *soi / bang*(-go) (gai tun)*
small / square*(-A.CL) (N.MOD candy)
'small/square (candy)'

b. *seho / ts'ubi(*-go) (gai tun)*
beautiful / cute(*-A.CL) (N.MOD candy)
'beautiful/cute (candy)'

The adjective classifier is a 'classifier' in the sense that it must index the class of the noun (i.e. like numeral classifiers, with which it has the same form). Nouns in Sinitic languages belong to classes based on physical properties, illustrated in (2): one-dimension (length OR height; 1-D), two-dimension (2-D), and three-dimension (3-D); Sinitic languages also have default (DF) classifiers (*gai* and *go* in Teochew), which are neutral with respect to dimension. Only the (100+) classifiers (of around 150-200) that indicate size/shape combine with adjectives. Classifiers expressing quantity/numerosity (etc.) occur as numeral classifiers, but never as adjective classifiers.

(2) *dua / soi-diao / -tai / -dio / -tsia / -gai*
big / small-A.CL$_{1-D-length}$ / -A.CL$_{1-D-height}$ / -A.CL$_{2-D}$ / -A.CL$_{3-D}$ / -A.CL$_{df}$
1-D-LENGTH: 'big/small, for 1-D horizontal noun class'
1-D-HEIGHT: 'big/small, for 1-D vertical noun class'
2-D: 'big/small, for 2-D noun class'
3-D: 'big/small, for 3-D noun class'
DF: 'big/small, for default/unspecified class of noun'

Data to be explained In general, the dimension-related lexical semantics of Shantou Teochew adjectives and classifiers must 'match', as summarized in Table 1. Dimension-specific adjectives (i.e. *long/short*, *tall/little*, the shape adjectives) must combine with dimensional adjective classifiers that have identical dimensional lexical semantics; e.g. *long* (expresses 1 dimensionality, horizontally) can ONLY combine with 1D-Length classifiers, and not 3D classifiers; see (3). Of interest here is that *big* and *small* can combine with *any* dimensional adjective classifiers; see (2).

Table 1: Dimension matching in Shantou Teochew CMA

A.CL \ Adjective	*big* & *small*	*long* & *short*	*tall* & *little*	*square*, *triangular*, *oval* & *round*
1-D-LENGTH	✓	✓	×	×
1-D-HEIGHT	✓	×	✓	×
2-D	✓	×	×	✓
3-D	✓	×	×	×
default	✓	✓	✓	✓

(3) *dun / do-diao / *-tai / *-dio / *-tsia / -gai*
long / short-A.CL$_{1-D-length}$ / *-A.CL$_{1-D-height}$ / *-A.CL$_{2-D}$ / *-A.CL$_{3-D}$ / -A.CL$_{df}$
1-D-LENGTH: 'long/short'
DF: 'long/short in a default-dimensional way'

Second, *big* and *small*, but no other adjectives, combine (relatively) freely with nouns (4-a) and verbs (4-b) in Shantou Teochew as degree modifiers. Crucially, we observe that adjective classifiers are ungrammatical, ONLY when modifying non-adjectives. (We note the degree reading of *small* challenges the 'Bigness Generalization' (Morzycki, 2009), that only upward monotonic size adjectives can systematically receive degree readings (cp. Xie, 2010).)

(4) a. *dua/soi (*-go) muinun* (lit. 'big/small (*-A.CL) beauty'), 'big/small beauty'
b. *big/soi (*-go) tang* (lit. 'big/small (*-A.CL) earn'), 'big/small earn'

Proposal We propose that the flexibility of *big/small* with respect to classifier-matching and category modification (in the absence of a classifier) is explained just if the lexical semantics of *big/small* lack dimension, in contrast to all other dimensional adjectives in Shantou Teochew.

Analysis As a starting point, for adjectives we assume a standard Degree Semantics as in (5-a), where gradable predicates with a semantic type of $< d, et >$ denote a relation between an individual and a degree. For adjective classifiers, we build on Luo & Biggs's (to appear) analysis on the lexical semantics

for ⟦ Adjective Classifier ⟧ in (5-b), where one function of Adjective Classifiers is to overtly identify a Comparison Class via conventional implicature (shown following $\diamond$) , providing a standard relative to which the value of the combined gradable adjective is evaluated (evidence not shown for space).

(5) a. $[\![\textit{long}]\!] \rightsquigarrow \lambda d.\lambda x.\text{long}(x) \geq d$

b. $[\![\text{Adjective Classifier}]\!] \rightsquigarrow \lambda P_{<d,et>}.\lambda Q_{<e,t>}.\lambda x.\forall d{\in}R_{std:CC}.[P(x)(d)] \wedge Q(x) \diamond \lambda Q.Q{\subseteq}\text{CLASS}$

(i) P represents the adjectival predicate, and Q stands for the modified noun

(ii) CLASS denotes conjoined properties that the noun (with which the relevant classifier is used) has

(iii) $R_{std:CC}$ represents the standard relative to which the value of the combined adjective is evaluated, which is around the median value over the C(omparison)C(lass) (see Solt (2011) for calculation details); in this case, CC = Q ∩ CLASS.

The denotations in (5-a)-(5-b) are clearly insufficient for Shantou Teochew as they fail to capture the fact that the size adjectives *big* and *small* have distinct lexical semantic compositional restrictions to all other adjectives (i.e. Table 1). First, dimensionality in (5-a) must be removed for *big*/ *small*; otherwise, (2) would be ungrammatical. In the spirit of Morzycki (2009), we underspecify the appropriate flavor of *big* (and *small*, here), removing dimensionality while retaining the degree reading. We update the lexical semantics for *big* and *small* as in (6), adapting Wellwood's (2014, 2015) analysis of the semantics of *much*, with μ in (6) an object-language variable of which the measure function type is assigned by the assignment function A. α may be of type e in a NP or type v in a vP (as in (4)).

(6) a. $[\![\textit{big}_{\mu}]\!]^{A} \rightsquigarrow \lambda d.\lambda \alpha.A(\mu)(\alpha) \geq d$ b. $[\![\textit{small}_{\mu}]\!]^{A} \rightsquigarrow \lambda d.\lambda \alpha.A(\mu)(\alpha) \leq d$

Second, to account for dimension matching patterns in Table 1, we revise the lexical semantics of Adjective Classifiers in (5-b) to (7). As shown for the 1-D-Length adjective classifier *diao*, we propose that the adjective argument P includes a presupposition indicating either (i) a preference for specific dimensionality, or (ii) the existence of an assignment function A and a variable μ in the denotation of the combined adjective. (7) accounts for the grammatical cases in (1-a) and (2), while excluding ungrammatical (1-b).

(7) $[\![\textit{diao}]\!]^{A} \rightsquigarrow \lambda P$: $\underline{[\text{Dim}(P)\text{=1.D.Length}] \vee [\exists A.\exists \mu.A(\mu){\in}[\![P]\!]]}.\lambda Q.\lambda x.\forall d{\in}R_{std:CC}.[P(x)(d)] \wedge Q(x) \diamond \lambda Q.Q{\subseteq}\text{CLASS}$, where CLASS denotes conjoined properties that nouns with which the classifier *diao* is used have, e.g., one-dimensional ∧ emphasizing on length ∧ stick-like ...

We show the combination of *diao* in (7) with (1D) *dun* 'long' (8-a) vs. (dimensionless) *dua* 'big' (8-b).

(8) a. $[\![\textit{dun-diao}]\!]^{A} = [\![\textit{diao}]\!]^{A} ([\![\textit{dun}]\!]^{A})$
$\rightsquigarrow \lambda P$: $[\text{Dim}(P)\text{=1.D.Length}] \vee [\exists A.\exists \mu.A(\mu){\in}[\![P]\!]].\lambda Q.\lambda x.\forall d{\in}R_{std:CC}.[P(x)(d)] \wedge Q(x) \diamond \lambda Q.Q{\subseteq}\text{CLASS}$ ($\lambda d.\lambda x.\text{long}(x) \geq d$) (cf. (5-a))
$\rightsquigarrow \lambda Q.\lambda x.\forall d{\in}R_{std:CC}.[\text{long}(x) \geq d] \wedge Q(x) \diamond \lambda Q.Q{\subseteq}\text{CLASS}$

b. $[\![\textit{dua}_{\mu}\textit{-diao}]\!]^{A} = [\![\textit{diao}]\!]^{A} ([\![\textit{dua}_{\mu}]\!]^{A})$
$\rightsquigarrow \lambda P$: $[\text{Dim}(P)\text{=1.D.Length}] \vee [\exists A.\exists \mu.A(\mu){\in}[\![P]\!]].\lambda Q.\lambda x.\forall d{\in}R_{std:CC}.[P(x)(d)] \wedge Q(x) \diamond \lambda Q.Q{\subseteq}\text{CLASS}$ ($\lambda d.\lambda x.A(\mu)(x) \geq d$) (cf. (6-a))
$\rightsquigarrow \lambda Q.\lambda x.\forall d{\in}R_{std:CC}.[A(\mu)(x) \geq d] \wedge Q(x) \diamond \lambda Q.Q{\subseteq}\text{CLASS}$

In (8-b), the value of $A(\mu)$ in a given context depends on what sort of entity the measured entities are (cf. Wellwood (2015) and the Traces and Pronouns Rule (Heim & Kratzer, 1998)). Given that the entity x possesses the conjoined properties denoted by the conventionalized meaning of the classifier *diao*, e.g., 1-D ∧ emphasizing horizontal length ∧ stick-like... (see (7)), $A(\mu)$ should be length-related. Likewise, example (9) with 2-D adjective classifier *dio* correctly demonstrates that the dimensionality of *small* depends on its combination with the adjective classifier (2-D, in this case), while the adjective itself contributes only a dimensionless degree reading (cf. (2)).

(9) $[\![\textit{soi}_{\mu}\textit{-do}]\!]^{A} = [\![\textit{dio}]\!]^{A} ([\![\textit{soi}_{\mu}]\!]^{A}) \rightsquigarrow \lambda P$: $[\text{Dim}(P)\text{=2.D}] \vee [\exists A.\exists \mu.A(\mu){\in}[\![P]\!]].\lambda Q.\lambda x.$
$\forall d{\in}R_{std:CC}.[P(x)(d)] \wedge Q(x) \diamond \lambda Q.Q{\subseteq}\text{CLASS}$ ($\lambda d.\lambda x.A(\mu)(x) \leq d$) (cf. (6-b))
$\rightsquigarrow \lambda Q.\lambda x.\forall d{\in}R_{std:CC}.[A(\mu)(x) \leq d)] \wedge Q(x) \diamond \lambda Q.Q{\subseteq}\text{CLASS}$, where CLASS denotes conjoined properties that nouns with which *dio* is used have, e.g., two-dimensional ∧ paper-like ...

Time permitting, we provide compositional semantics for examples with default Adjective Classifiers.

Implications Dimension-matching patterns in Shantou Teochew provide novel morphosyntactic evidence that the adjectives *big*/*small* can contribute a dimensionless degree function (cf. Morzycki's proposals). The fact that *big* and *small* contribute dimensionless degree readings in each of Adj, N, and V structures offers a novel kind of evidence for proposals that measurement is not category-unique (e.g. Wellwood 2015, and references there). We conclude by considering if degree readings of size adjectives could be a cross-linguistic universal (cf. Liu (2010) on Taiwanese Southern Min).