

Morphological Transparency and Autonomous Morphology

A Comparative Study of Tough Constructions and Nominalization

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Abstract

This paper studies the nominalization of tough predicates in Mandarin Chinese, Japanese, and English, The emphasis is on Mandarin Chinese. Mandarin offers one of the most challenging testing grounds for morphological theories because many morpholexical processes in this language lack overt markers and thus the theoretical implications are difficult to tease out.

First, two theories of nominalization based on English and Japanese respectively are outlined in order to explicate the theoretical issues at stake. Next, Huang's (1992 & 1993) arguments that Mandarin tough constructions involve lexical operations are summarized. To account for the Mandarin facts, the Autonomous Morphology Hypothesis is defined in terms of morphological transparency. The hypothesis stipulates that a morpholexical rule can only access lexical information encoded on the locus of its application or the morphologically transparent constituents of this locus, regardless of whether the rule is morphologically marked or not. The fourth section shows that neither Rappaport's Thematic Constancy Hypothesis (TCH) nor Saiki's Functional Constancy Hypothesis (FCH) can satisfactorily account for the Mandarin data. Instead, the Autonomous Morphology Hypothesis offers a unified account of the nominalization of tough predicates in all three languages.

In sum, it is shown that linguistic facts in other languages support the proposal of Morphological Transparency. The Transparency condition is shown to apply to other morpholexical processes, such as causativization in Chicheŵa and VR compounding in Mandarin. Additional facts discussed include Japanese case-assigning nominals, and the Bracketing Paradox. The study of a lexical process without morphological markings yields support for the autonomy of morphology.

I. Introduction

The study of nominalization plays a crucial role throughout various stages of the development of generative grammars. Recently, with more and more theoretical work directed towards the interface of morpho-syntax, re-examination of theories of nominalization often brings new insights. My study involves nominalization of tough predicates in Mandarin Chinese, Japanese, and English. The emphasis is on Mandarin Chinese because the language offers one of the most challenging testing grounds for morphological theories. Its morpholexical process is often not marked with any formatives and thus the theoretical implications are difficult to tease out¹.

¹ However, there are a few recent works arguing that Mandarin Chinese indeed does show some interesting morphology. Please see Huang (1993), Dai(1991), and Tang (1989) and references therein.

I will first outline two theories of nominalization based on English and Japanese respectively to explicate the theoretical issues at stake. Next, I summarize the arguments presented in Huang (1992 & 1993) that Mandarin tough constructions involve lexical operations. I will also observe that nominalization is allowed with complex tough predicates in Mandarin. To account for the Mandarin facts, an Autonomous Morphology Hypothesis is defined in terms of morphological transparency. The hypothesis stipulates that a morpholexical rule can only access lexical information encoded on the locus of its application or the morphologically transparent constituents of this locus, regardless of whether the rule is morphologically marked or not. In the fourth section I show that the two previous theories cannot satisfactorily account for the Mandarin data. Instead the Autonomous Morphology Hypothesis offers a unified account of the nominalization of tough predicates in all three languages. Some predictions and theoretical implications are discussed in the conclusion of this study.

II. Theoretical Background: Rappaport (1983) and Saiki (1987)

II.A. Rappaport's (1983) Thematic Constancy Hypothesis

Two theories of nominalization are introduced in this section. Rappaport's (1983) theory is one of the earliest to propose that participating arguments in nominalization are governed by thematic structures. On the other hand, Saiki (1987) uses Japanese data to argue for an alternative theory based on the constancy of grammatical function which parameterizes with the (morphological) case-assigning abilities of different languages.

Following previous literature, I will refer to Rappaport's theory as the Thematic Constancy Hypothesis (TCH) and Saiki's theory as the Functional Constancy Hypothesis (FCH). Since both theories were formulated within the theory of Lexical-Functional Grammar (LFG), they offer a convenient contrast for two drastically different approaches to nominalization. It will be clear from our discussion that the two approaches represent two competing premises for theories of nominalization and the implications of the contrast between the two theories apply to any theoretical framework.

Rappaport (1983) observes that all participating arguments in English nominalization are strictly thematic and that thematic roles of all post-nominal arguments are clearly marked by prepositions, as examples (1) and (2) demonstrate.

(1)<Theme, Source>

- a. John fled the city.
- b. John's flight from the city.
- c. *John's flight of the city.

(2)<Theme, Goal>

- a. Jane fled to the city.
- b. Janet's flight to the city.
- c. *Jane's flight of the city.

The above facts prompt Rappaport to adopt the important hypothesis that a verb and its nominalized counterpart share an identical thematic-structure². This hypothesis captures the semantic correspondence between a verb and a deverbal noun and thus serves as the premise of many subsequent studies of nominalization. The hypothesis of a shared thematic structure not

² This hypothesis has a long history in generative grammar and is in the center of the debate between lexicalism and transformationalism, as observed by a reviewer. Please see references cited in Rappaport (1983) and Grimshaw (1990) for earlier relevant works.

only accounts for the similarity of subcategorization frames of a verb and a deverbal noun but also allows a more elegant account of nominalization in the lexicon, where the morphology of nominalization is determined. However, as shown in the literature, a verb and a corresponding deverbal noun do not necessarily utilize the identical representations of the thematic structure. The surface representations can be different (as in 3), or certain classes of verbs may have no corresponding deverbal nouns (as in 4).

- (3) a. The President commanded (*to) the federal troops to enter Los Angeles.
b. the President's command *(to) the federal troops to enter Los Angeles.
- (4) a. The candidate seems to have committed a serious mistake.
b. *the candidate's seemingness (of having committed a serious mistake)

Rappaport proposes the Thematic Constancy Hypothesis to account for the discrepancy between representations of thematic roles in a VP and a NP. She postulates that deverbal nouns show thematic constancy because the surface representation of an argument of a nominal predicate is determined by semantic relations. In LFG terms, the grammatical functions of these arguments are determined by their thematic roles. Nominals in English allow only two types of arguments, the prenominal POSSessive and the post-nominal OBL(ique)s. Prepositions explicitly assign semantically restricted OBL roles, therefore the GOAL role can be represented as an OBJect in the verbal phrase (3a) but has to be represented as a OBLgoal in the nominal phrase (3b). In addition, the candidate in (4) is a non-thematic argument of the predicate; thus it is impossible to assign the grammatical function to it. Thus the fact that raising verbs do not nominalize is predicted. The hypothesis can also be extended to explain the following English facts.

- (5) a. A linguist knows all the theories.
b. a linguist's knowledge
c. *all the theories' knowledge

In (5), it is shown that the prenominal POSS function can only represent certain thematic roles. In terms of Rappaport's Thematic Constancy Hypothesis, this can be explained by the fact that POSS is a semantically restricted function. And it happens (in English) that a POSS function cannot encode the thematic role of EXPERIENCED.

To sum up, Rappaport's (1983) theory is based on the premise that verbs and corresponding deverbal nouns share identical thematic structures. She suggests that, while a freer mapping between thematic roles and grammatical functions are possible in a verbal phrase, arguments of a nominal predicate have highly marked thematic relations to their governing predicates. Nominal predicates in English can only have either POSS or OBL argument. POSS can only represent a small set of thematic roles, including AGENT, THEME, and PATIENT, while OBLs can only have the thematic roles that the governing preposition marks.

The Thematic Constancy Hypothesis has been suggested to be universal³. Even though it is formulated in LFG terms, it can be easily translated into other theoretical frameworks. For instance, the premise that verbals and deverbal nouns share thematic structures can be easily formulated in terms of the Theta Criterion in the GB framework. That the nominal argument assignment is determined by semantic/thematic relations can conceivably be captured with certain versions of interaction between the CASE theory and Theta Criterion in GB. Regardless of the universality of the Thematic Constancy Hypothesis, Rappaport's theory anchors the commonly accepted paradigm of theories of nominalization:

³ Later works, such as Grimshaw (1990), however, point out that the TCH indeed is not universal.

while lexical rules will stipulate the correct forms of nominal affixes and any semantic changes, the difference in nominal and verbal constructions lies in the nature of nominal and verbal heads, not in the operation of nominalization.

II.B. Saiki's (1987) Functional Constancy Hypothesis

The thematic Constancy Hypothesis as a universal predicts that only thematic arguments can participate in nominalization. This is shown to be false by the Japanese data, observed in Ishikawa (1985) and discussed in Saiki (1987). In particular, Saiki (1987) shows that tough predicates nominalize in Japanese. This is exemplified in (6), from Saiki (1987:284):

- (6) a. John no koogi ga gakusei-tachi ni(totte) rikaishi-yasui
 John lecture students for understand- easy
 'John's lecture is easy for the students to understand.'
 b. John no koogi no gakusei-tachi ni-totte no rikaishi-yasu-sa
 John lecture students for understand- easy- NOM
 'John's lecture's easiness for the students to understand (literal)'

Japanese tough constructions involve affixation of either -yasui 'to be easy' (in 6) or -nikui 'to be difficult' (in 7) to the predicate. The affixation of -sa marks nominalization. (6) shows that the nominalization of a tough construction is possible regardless of the fact that the SUBJ of the tough construction is non-thematic. Examples (6) and (7) can be contrasted with the unacceptable English (8b), which was correctly predicted by the Thematic Constancy Hypothesis.

- (7) a. S-sya no seihin ga koware-nikui (Saiki 1987:285)
 S-company product break-difficult
 'It is difficult for the product of company S to break.'
 b. S-sya no seihin no koware-niku-sa
 S-company product break- difficult- nominalizer
 'company S's product's difficulty to break (lit.)'

- (8) a. This book is easy to read.
 b. *The easiness of this book to read.

Saiki proposes the Functional Constancy Hypothesis to account for the contrast between English and Japanese with regard to nominalization. She hypothesizes that it is the Grammatical Function assignment that remains constant for deverbal nouns. Thus the reason why non-thematic arguments fail to participate in nominalization in English is not because they do not stand in any semantic (thematic) relation with the predicate. Instead, it is because English NPs do not assign the required grammatical functions, such as SUBJ and OBJ. Grammatical functions are structurally encoded in English, and English NP structures are encoded only for two types of grammatical functions: POSS and OBL. Japanese, on the other hand, is a non-configurational language which assigns grammatical functions with ease affixation. Since case assignment is allowed in Japanese NP and grammatical function identification is possible (Iida 1989), the Functional Constancy Hypothesis predicts that even non-thematic arguments will be allowed in nominalization as long as they are assigned the appropriate cases from the case affixes. This hypothesis also predicts that other non-configurational languages will also allow non-thematic arguments in nominalization. This prediction is borne out with Korean data (Saiki and Cho

1987.436-7.5).

- (9) a. Hakcatul-un [hankwuk-i sencinkwuk-ila] ko kacheng-haessta
scholar-TOP Korea-Nom advanced country-Cop comp. hypothesis-did
'Scholars hypothesized that Korea was an advanced country.'
b. Hakcatul-un hankwuk-ul [sencinkwuk-ila] ko kacheng-haessta
scholar-TOP Korea-ACC advanced country-Cop comp. hypothesis-did
'Scholars hypothesized Korea to be an advanced country.'
c. Hakcatul-uy hankwuk-uy [sencinkwuk-ilanun] kacheng
scholar-GEN Korea-GEN advanced country-Cop-comp. hypothesis
'scholars' hypothesis of Korea to be an advanced country (literal)'

The verb kacheng-haessta allows the SUBJ of its complement to raise to a OBJ position, as shown by (9b). In (9c), we see that the non-thematic hankwuk 'Korea' is allowed as an argument of the deverbal noun kacheng 'hypothesis'. Since Korean, like other non-configurational languages, assigns grammatical functions in terms of case-affixes, this seems to offer strong support for the Functional Constancy Hypothesis, which predicts that participating arguments of nominals are allowed as long as they are assigned the correct grammatical function by case affixes.

The Functional Constancy Hypothesis, however, has some undesirable implications. Although theories vary as to how they treat grammatical functions (or relations), from primitives in Relational Grammar to structure-dependently defined in Transformational Grammars, it remains accepted that an identical thematic structure may be mapped to many different surface representations of grammatical functions. In other words, in maintaining the Functional Constancy Hypothesis, Saiki would have to assume that each grammatical function has already been linked to a certain thematic role. A Functional Constancy Hypothesis would make incorrect predictions, if, for example, a passive predicate argument structure is used as the base of deriving nominals. In this sense, the Functional Constancy Hypothesis necessarily assumes a limited version of the Thematic Constancy Hypothesis. Theoretically speaking, it is also observed that LFG has moved towards treating grammatical functions as autonomous but not as primitives. The recent proposal of the Lexical Mapping Theory (Bresnan and Kanerva 1990, Huang 1993) predicts grammatical functions in predicate-argument structures in terms of thematic structures. In addition, Dowty's (1991) recent work also aims to predict the occurrences of grammatical functions in terms of semantic properties. Thus, a hypothesis that gives grammatical functions a primary role over thematic roles would be marked.

III. The Lexical Nature of Tough Constructions in Mandarin (Huang 1992).

Mandarin Chinese, with configurationally defined grammatical functions and without case marking, is typologically very different from either Japanese, Korea, or English. I will show in this section that Mandarin tough constructions offer some interesting contrasts with English and Japanese. Huang (1992) shows that tough constructions in Mandarin Chinese involve both morpholexical processes and syntactic operations. The lexical nature of Mandarin tough constructions is established with four tests. The first is based on lexical integrity. It is observed that a typical tough-V sequence does not allow the insertion of either an' agentive PP or any adjunct as in (10). This suggests that the tough-V sequence be treated as a lexical item.

(10) zhe be shu hen nan (*bei ren) du

this CLASS book very difficult (BY people) read
'This book is difficult to read.'

Second, it behaves like a di-syllabic verb in A-not-A question formation (11a & b). On the other hand, it does not allow the reduplication of the verbal head, a distribution allowed for real VPs such as in (11c).

- (11) a. Cai hao-bu-haochi/haochi-bu-haochi/*haochi-bu-hao
Vegetable/food easy-Neg-easy+eat/easy+eat-Neg-easy+eat/easy+eat-Neg-easy
'How is the food/Is the food good or not?'
- b. ta you-bu-youmo/youmo-bu-youmo/*youmo-bu-you
s/he hu-Neg-humor/humor-Neg-humor/humor-Neg-hu
'Is s/he humorous?'
- c. Zhangsan ti-qiu-bu-ti
Zhangsan kick-ball-NEG-kick
'Does Zhangsan play soccer?'

In other words, these tough -Vs feed the attested question formation lexical rule for di-syllabic verbs but fails to under go syntactic A-not-A formation. Hence it can only be formed by lexical rules.

Third, a Mandarin tough construction is strictly intransitive and stative, regardless of the valence of the base predicate. Hence, it cannot be accounted for by a typical syntactic rule, which would involve a definite structure with a fixed number of arguments changed.

Fourth, Mandarin tough constructions show both idiosyncratic gaps and suppletive semantic shifts, as in (12).

- (12) a. hao-xiao: easy-laugh 'funny' vs.
 *nan-xiao: difficult-laugh
- b. nan-de: difficult-get 'special, commendable' vs.
 *hao-de: easy-get
- c. hao-shuohua: easy-talk '(of a person) easily imposed upon', but
- d. hao-shuo: easy-say '(of a matter) can be easily solved', but
- e. nan-shuo: difficult-tell 'not predictable'
 vs. *hao-jiang: easy-talk

Both are typical of lexical operations, and will be impossible to account for if syntactic operations are the only source of the formation of these data.

On the other hand, there are cases of Mandarin tough constructions which violate the above tests for lexical operations. (13), for instance, allows the insertion of an agentive PP between the tough predicate and the embedded predicate.

- (13) xingdong kuaijie de redaiyu hen bu rongyi (bei ren) zhuadao
 action swift DE tropical-fish very Neg easy by people catch-reach
'It is not easy (for people) to catch swift tropical fish.'

Thus, Huang (1992) concludes that the Mandarin 'tough constructions' consist of two disparate constructions: one involving morphologically formed complex predicates (10-12) and the other involving 'Raising-to-Subject' (13). I will concentrate on the lexical tough constructions because they involve a somewhat surprising result when nominalized⁴.

⁴ That fact that there are both syntactic and lexical tough predicates in Mandarin suggest an explanation

IV. The Autonomous Morphology Hypothesis

IV.A. Theory and Motivation

The lexical tough constructions in Mandarin offer an interesting test for both the Thematic Constancy Hypothesis and the Functional Constancy Hypothesis. According to the Thematic Constancy Hypothesis, no non-thematic arguments can participate in nominalization, and Mandarin should not be an exception. According to the Functional Constancy Hypothesis, Mandarin NPs lack case-marking abilities and can only structurally encode POSS and OBL functions. Thus, the non-thematic arguments cannot receive surface representation and cannot be involved in nominalization either. However, contrary to the prediction of both hypotheses, nominalization of tough-predicates are allowed in Mandarin, as shown in (15) and (16)⁵.

- (14) a. [zhe ben shu de nandu]_{np} shi churning de
this CLASS book DE difficult-read BE famous DE
'That the book is difficult to read is well-known.'
b. [xiti de rongyi zuo]_{np} chuhuyiliao
homework DE easy do out-of- expectation
'That the homework was so easy was totally unexpected.'
- (15) a. ta lian-shang you xie nan-kan
s/he face-top have some difficult-look
'S/He showed some displeasure with his/her expression'
b. Zhe xianran shi ta zhesheng zuida de nan-ren le
this obvious be s/he this-life most-big DE difficult-bear PERF
'This is obviously the most intolerable thing in his/her life.'

The above data are counterexamples to both the Thematic and Functional Constancy Hypotheses. They show that nominalization is governed neither by the semantic relation between the arguments and the nominal heads, nor by the case-assigning properties of the nominal heads. Thus, both Saiki's and Rappaport's accounts involve unnecessarily rich syntactic information. In Rappaport's case, the thematic structures of local and embedded arguments are not distinguished; while in Saiki's case, the whole NP structure, including the syntactic mechanism of dependency

for the typology of tough predicates: rongyi is strictly syntactic and hao is strictly lexical. Nan, on the other hand, represents neutralization: The neutralization of nan can be explained because it is the semantically neutral partner of the pair of nan vs. yi 'easy' (as attested by the derived noun of nan-du 'difficulty' but not (rong)yi-du).

On the other hand, the syntactic tough constructions seem to be far from uniform. They involve raising from both object and subject positions. Moreover, they govern both transitive and unaccusative verbs (Gu Yang p.c.). It is observed that the long-distance tough predicates in Mandarin can be reanalyzed as simply a preverbal adverb (W. Baxter p.c.). Mandarin would have only lexical tough constructions if this is the case

⁵ The examples in (13) and (15) are extracted from the Academia Sinica newspaper corpus (Huang and Chen 1990, and Huang 1994), as opposed to the constructed data in (14). Take note that the data discussed here cannot be treated on par with English gerundives; where the construction arguably involves only a verbal paradigm and no argument-structure changing. An important piece of evidence is that pre-verbal adjuncts are not allowed with the nominalization cases studied here, as in i).

- i) a. zhezhong yuebing shifen hao-chi
this kind moon-cake very good-eat
'This kind of moon-cake is very delicious.'
b. *zhezhong yuebing de shifen hao-chi

Please see J. Tang (1993) for contrastive studies of Mandarin de and English gerundives.

marking, is considered. I will propose a hypothesis that uses only morphological information and makes the correct prediction for all nominalization facts.

The crucial observation of tough constructions in Chinese, English, and Japanese is that both Chinese and Japanese involve complex predicate formation while English involves syntactic long-distance dependency only. We have shown clearly in the last section that Mandarin tough constructions are lexical. We will now show that the formation of tough constructions in Japanese indeed involve a lexical instead of syntactic operation.

First, it can be shown that the affixation of the tough suffixes yasui 'to be easy', nikui 'to be difficult' etc. changes the category of the verb into an (predicative) adjective, as in (16).

- (16) kono hon wa totemo yomi-yasui
This book very read- easy
'This book is very easy to read.'

According to Ikeya (1992), the fact that -yasui turns the whole complex predicate into an adjective is shown by the fact that it is modified by totemo 'very', a degree adverb that can only modify adjectives. Since a syntactic operation cannot change grammatical categories while morpholexical processes can, this shows that the affixation of -yasui is a morpholexical rule. This argument is also supported by both the inflectional paradigm of the tough predicates and the nominalization facts. The -sa nominalizer, meaning 'the degree of..', can only be attached to an adjective (Harada p.c. and Ikeya 1992). It has already been shown that tough predicates allow -sa nominalization, as in (17).

- (17) John no koogi no gakusei-tachi nitotte no rikaishi-yasu-sa (Saiki 1987:284)
=6b John lecture students for understand- easy- NOM
'John's lecture's easiness for the students to understand'

Another piece of evidence to support the lexical status of the formation of tough predicates is given in Saiki (1987.260).

- (18) a. [[suwar-i] v yasui] → [suwariyasui] adj 'easy to sit on'
b. [[aruk-i] v zura] → [arukizura] adj 'hard to walk (lit.)'

Notice in (18) that the verbal stem which ends in closed syllables (suwar and aruk) take the default vowel i when affixed with a tough morpheme. In a restrictive theory where all the lexical forms are fully inflected when inserted and where no post-syntax reorganization of phonology is allowed, (18) offers a very strong argument for the lexical status of the tough predicates. Based on the above evidence, I will follow both Ishikawa's (1985) and Saiki's (1987) complex predicate accounts.

Thus, I have shown that both Chinese and Japanese tough constructions involve morpholexical complex predicate formation and that they both allow nominalization of the tough predicates. English does not allow lexical tough and hence does not allow nominalization of tough constructions⁶. Since nominalization in the three languages seems to share the same

⁶ As pointed out by an IsCLL III reviewer, English does show similar dependencies with the $-(\alpha)$ bility affix, such as in 'this book's readability'. The same reviewer also correctly points out that this would be

semantics, and since the language-specific morphology of nominalization in each language does not rule out the possible derivation, I will follow the assumption that it is the extraction of participating arguments that distinguishes English from both Japanese and Mandarin Chinese. This assumption is adopted without argumentation in both TCH and FCH. The most crucial observation is that an embedded participating argument can be extracted from a base predicate if the base predicate is part of a complex predicate (as in Japanese and Mandarin), but no extraction is allowed from within a propositional argument of a simplex predicate (as in English). This observation can be simplified to the locality condition that a morpholexical rule only has access to argument-structures at the locus of its application.

I capture this generalization in terms of **The Autonomous Morphology Hypothesis** and the concept of **Morphological Transparency**, stated as follows:

(19) A. AUTONOMOUS MORPHOLOGY HYPOTHESIS:

A MORPHOLEXICAL RULE CAN ONLY REFER TO ELEMENTS WHICH ARE MORPHOLOGICALLY TRANSPARENT AT ITS LOCUS OF APPLICATION.

B. MORPHOLOGICAL TRANSPARENCY

A LINGUISTIC ELEMENT IS MORPHOLOGICALLY TRANSPARENT TO A MORPHOLEXICAL RULE IF AND ONLY IF 1) IT IS THE LOCUS OF THAT MORPHOLEXICAL RULE, OR 2) IT PREVIOUSLY UNDERWENT A MORPHOLOGICAL OPERATION.

The basic premise of the above proposals is that a morpholexical operation is only sensitive to morphological structures and information. This position is long-assumed for operations involving various morphological formatives, under the umbrella term of The Lexical Integrity Hypothesis. My proposal here extends it to morpholexically encoded semantic/thematic information. In other words, Lexical Integrity also governs the morpholexical operations on argument structures. Thus, I am applying the autonomy of morphology to both the 'syntax' and 'semantics' of a morpholexical process, adopting the terms of Alsina (in press a). My version of the Autonomous Morphology Hypothesis (19a) is a locality condition which is defined strictly in morphological terms. The definition of Morphologically Transparency in (19b) stipulates clearly the kind of morphological relations that sanctions morpholexical operations. In addition to the logically inevitable stipulation that the locus of its application is transparent to any morpholexical rule, I propose that morphological transparency can also be licensed by previous morphological operations. In other words, morphology is autonomous in two senses: first, unlike in syntax, the locality condition in morphology is not limited to a local tree; second, a morpholexical rule is sensitive to formatives of previous morphological rules, but not to formatives of other modules. This theory predicts that a participating argument of a derived nominal must be governed by a predicate-argument structure encoded on a morphologically transparent subpart of that nominal, and that the lexical unit governing the participating argument need not be directly involved in the morphological operation of nominalization.

In the remaining part of this section, I will show how this hypothesis offers a straightforward account of the dilemma posed by the nominalization of Mandarin tough predicates. I will also show how this hypothesis lays foundation to accounts for three different constructions in three different languages: Chicheŵa causatives, Chinese resultative compounds, and Japanese case-assigning nominals.

accounted for by our Autonomous Morphology Hypothesis, as discussed later in this paper.

IV.B. Predictions

IV.B.1. Nominalization and Tough Constructions

The Autonomous Morphology Hypothesis and Morphological Transparency straightforwardly account for the fact that no raising predicates can be nominalized in English. (20a) is intended to involve nominalization of the tough construction. Take note that locus of the morphological operation of -ness affixation is on the predicate easy. Since easy is a simplex verb, it does not contain any morphologically transparent subparts other than itself. Semantically, easy takes a single propositional argument, as in (20b). Since a proposition is non-referential and thus not a possible participating argument of nominalization, the morpholexical rule of -ness affixation is ruled out. Take note that Morphological Transparency makes the critical contribution of ruling out the extraction of arguments from the propositional argument of easy, i.e. the arguments of seem in (21a).

- (20) a. *The candidate's easiness to win the election
b. 'EASY <proposition>'

- (21) a. *Kim's seemingness to be happy
b. 'SEEM <proposition>'

Even though they are semantically compatible as participating arguments of nominalization, they are governed by a morphologically opaque (i.e. non-transparent) predicate and are therefore not available for extraction. This account differs from the unsuccessful TCH and FCH accounts in that it relies solely on morphological conditions. The unacceptability of (21a) can be explained along the same lines.

The account for the Japanese data lies in the fact that tough constructions involve complex predicates in this language.

- (22) a. kono hon no yomi-yasu-sa
this book read - easy - NOM
'this book's easiness to read'
b. 'EASY <READ <agent, patient>>'

In (22), the critical fact is that the locus of the morphology of nominalization is on the whole complex predicate yomi-yasui 'easy to read'. Thus, since both yomi and yasui are morphologically transparent for the nominalization rule according to the above definitions, nominalization has access to both argument structures. As in English, the propositional argument of the higher predicate yasui 'easy' is not a legitimate candidate for a participating argument. I assume the same independently motivated semantic principles that select the patient role of the predicate yomi to participate in the tough complex predicate also select it as the participating argument in nominalization.

Similarly, in Mandarin, the morpholexical process of nominalization applies to the whole complex predicate, even though there is no overt morphological mark for nominalization, as in Japanese. My account predicts that the thematic structure of the base predicate du 'to read' will be available for extracting participating arguments in nominalization because it is Morphologically Transparent, as in (23). Its transparency is sanctioned by the fact that du is

concatenated with nan 'difficult' to form that complex tough predicate. In other words, that failure of nominalization of the English tough construction is simply because it involves a simplex verb which can neither supply a participating argument of nominalization directly nor through the argument structure of a morphologically transparent subpart.

- (23) a. [zhe ben shu de nandu]_{np} shi chuming de
 =14 this CLASS book DE difficult-read BE famous DE
 'That the book is difficult to read is well-known.'
 b. 'EASY <READ <agent, patient>>'

This account also correctly predicts that Mandarin simplex predicates which have only one propositional argument fail to nominalize too, as in (24).

- (24) a. ni cuo-guo-le zhechang yanjiang hen kexi
 you miss-EXP-LE this-CLASS speech very pity
 'It is a pity that you missed the talk.'
 b. *ni cuo-guo-le zhechang yanjiang de kexi
 you miss-EXP-LE this-CLASS speech DE pity

IV.B.2. Chicheŵa Causative

Alsina(1992) cites the following sentence to support his position that causative constructions involve three-place predicates in Chicheŵa. I will show that this fact can also be accounted for with the Autonomous Morphology Hypothesis⁷.

- (25) a. Zi-ku-onek-a kuti nyani a-na-pony-a mipira pa tsindwi
 8s-PR-appear-FV that la baboon ls-PS-throw-FV 3ball 16 5roof
 'It appeared that the baboon threw a ball on the roof.'
 b. 'Njovu i-ku-onek-ets-a kuti nyani a-na-pony-a mipira pa tsindwi
 9elephant 9s-PR-appear-CST-FV that la baboon ls-PS-throw-FV 3ball 16 5roof
 'The elephant makes it appears that the baboon threw a ball on the roof.'

- (26) onek, v, 'APPEAR <proposition>'

The English translation in (25b) is grammatical, hence there are no semantical grounds to rule (25b) out. In other words, no theory can rule out *a priori* the possibility that the CAUSEE is fused with an appropriate argument of the propositional argument of the base predicate onek 'to appear'. However, since causativization in Chicheŵa involves affixation of the causative morpheme ets, my theory requires that the fused argument be extracted from a Morphologically Transparent predicate. It is thus predicted that (25b) is ungrammatical. The locus of the application of the causativization morpholexical rule is the verb onek, which has only a propositional argument and has no Morphologically Transparent subparts. Since the lexical rule

⁷ The gloss of Alsina (1992) is followed here. Arabic numbers represent noun classes. PR stands for PRESENT, FV for Finite Verb, CST for CAUSATIVE, and PS for PAST.

cannot extract any referential argument to fuse with the abstract CAUSEE argument, its application is blocked and the verb onek cannot have corresponding causative reading. This account also predicts that causativization will be possible when the base predicate has a non-propositional argument. This is borne out with the following example involving the verb ganiz 'to think', which takes a referential subject and a sentential object, as in (27).

- (27) a. Kalulu a-ku-ganiz-its-a njovu kuti nyani a-na-pony-a mipira pa tsindwi
 la hare 9s-PR-think-CST-FV 9elephant that la baboon 1s-PS-throw-FV 3ball 16 5roof
 'The hare makes the elephant think that the baboon threw a ball on the roof.'
 b. ganik, v, 'THINK <SUBJ, proposition>'

In this case, the subject of the base predicate, njovu 'the elephant', is extracted by the causativization lexical rule to fuse with the CAUSEE of the higher clause.

IV.B.3. Chinese Resultatives and Japanese Case-as-signing Nominals

So far I have discussed the implications of the Autonomous Morphology Hypothesis in headed structures. I will now turn to concatenating structures where the existence of a dominant head cannot be established linguistically. The two structures we are going to discuss are the Mandarin VR resultative construction and the Japanese case-assigning nominals.

Huang and Lin (1992) give a proto-argument-based account of the Mandarin resultative compounds. Crucial to their account is that the so-called resultative compounds represent composite event-structures without any clearly defined logical relation between them. They also postulate that either component of the VR compound contributes one argument to the resultative compound and that the mapping between the selected base argument and the resultative argument is ONE-TO-ONE. This is motivated by data such as in (28) and (29).

- (28) a. Zhangsan ku-shi-le shoupa
 Zhangsan cry-wet-PERF handkerchief
 'Zhangsan cried such that the handkerchief is wet.'

- cf b. Zhangsan ku-le
 Zhangsan cry-PERF
 'Zhangsan cried.'

- cf. c. shoupa shi - le
 handkerchief wet - PERF
 'The handkerchief became wet.'

- (29) a. Lisi ti-po-le qiuxie
 Lisi kick - break - PERF sneakers
 'Lisi broke his/her sneakers (by playing soccer etc)'
 b. Mengjiangnu ku-dao-le wanli-changcheng
 Mengjiangnu cry-fall-PERF the Great Wall
 'Mengjiangnu cried such that the Great Wall fell.'

This approach supports the proposal that a morpholexical rule can refer to information encoded on all Morphologically Transparent subparts at the locus of the rule. Contrary to traditional

headed approach to morphology, Huang and Lin's account propose that each of the two predicates in a VR compound contributes an argument to the compound. This is allowed without further stipulation under the Autonomous Morphology Hypothesis as defined in (19) because both base predicates are Morphologically Transparent to the compounding morpholexical rule. This account, however, will be exceptional in any morphological theory which presupposes headed constructions⁸.

Another set of data that may be solved based on the ONE-TO-ONE constraint is the case-assigning properties of Japanese nominals. Iida (1987) observes that compound deverbal nouns and Sine-Japanese nominals can assign verbal cases and govern two arguments, while simplex deverbal nouns behave like non-deverbal nouns and can only have one nominal argument. This is demonstrated below in (30) and (31).

(30) a. (Iida 1987.96(3b))

Soori-daijin no wairo no uketori
 prime-minister SUBJ bribe GEN receipt
 'the prime minister's receipt of the bribe'

b. John no Ainu no kenkyuu (comp. Mandarin yanjiu)
 John GEN Ainu GEN research
 'John's research on the Ainu'

(31) (Iida 1897.125)

a. John no tsuri (Agent)
 'John's fishing'

b. unagi no tsuri (Theme)
 'fishing for eels'

c. umi no tsuri (Location)
 'fishing at the sea'

d. umi no unagi no tsuri
 sea GEN eels GEN fishing
 'fishing for eels living in the sea,
 fishing for eels at sea'
 [i.e. 'fishing for sea eels' CRH.]

(30a) involves a native compound and (30b) involves a Sine-Japanese compound. Both of the deverbal nouns allow two arguments corresponding to the verbs. On the other hand, the non-compound deverbal noun can only have one argument, vividly illustrated by (31d), where the two no marked NPs can only combine to form one NP (literally 'sea's eels') and cannot play two roles.

What is even more striking is that even among Sine-Japanese verbs, the ones that cannot be demonstrated to be compounds (i.e. those that correspond to only one Chinese character) behave like a native Japanese non-compound deverbal noun, too. This is shown in (32).

(32) (Iida 1987.133)

⁸ The best-known headed account of Li (1990), for instance, both over-generates and under-generates possible resultative compounds and interpretations. In addition, as Li (1990) himself admits, there is no clear-cut linguistic evidence available to indicate which of the components is the head. Please see Huang and Lin (1992) for detailed arguments against the headed account.

*John no Hamlet no yaku chuu (comp. Mandarin yi)
John GEN Hamlet GEN translation mid
'during John's translation of Hamlet'

Iida's (1987) account of the above facts postulates that the compound-forming process brings in aspectual features. Thus the non-compound deverbal nouns lack verbal aspect and cannot assign verbal cases. This is why they only allow one no marked argument. But this account has problems, such as why the affixation of chuu, a durative suffix supposedly carrying verbal aspect features, fails to save (32).

A straightforward account of the above facts can be composed based on the one-per-argument-structure constraint proposed in Huang and Lin (1992). In addition to the constraint that morpholexical rules can only operate on Morphologically Transparent lexical elements, we hypothesize that nominalization can only extract one participating argument from each argument structure governed by a Morphologically Transparent lexical element. In other words, unless the base predicate is composed of more than one morphologically transparent part governing argument structures, each deverbal noun can have only one participating argument. Thus, the proposed Autonomous Morphology Hypothesis offers a possible solution to an idiosyncratic set of Japanese data. It is again shown that it is unnecessary to invoke the syntactic mechanism of dependency (i.e. case) marking. The number of participating arguments in nominalization can be determined by morphological conditions alone. Since the one-per-argument-structure constraint is also called for by Mandarin VR compounding, it should be treated as a possible language universal or parameter. A complete account would obviously involve a much more detailed analysis of the data.

V. Implications and Conclusion

V.A. The Bracketing Paradox

The nominalization of tough predicates discussed in this paper is reminiscent of the classical problem of the Bracketing Paradox. In nominalization of tough predicates, an argument is extracted from an embedded predicate to be a participating argument of the highest bracketing category, the deverbal noun. This is not unlike some of the bracketing paradoxes discussed in the literature (e.g. Spencer 1991). An instance of the classical Bracketing Paradox is given in (33). The categorical selection restriction of the affixes (un- precedes an adjective and -ity follows an adjective to turn it into a noun) dictates the bracketing in (33a). However, the level ordering principle deciding the prosodic features of the derived word dictates that -ity, as a group I affix, be combined with the stem before the group II affix un-, as in (33b).

(33) The Bracketing Paradox

- a. r[un-predictabil]-ity]
(subcategorization requirement of affixes)
- b. [un-[predictabil- ity]]
(level ordering principles)

If the extraction of participating argument in nominalization is marked by a pair of curly brackets, then the nominalization of Mandarin tough predicates can be represented as the following bracketing paradox.

- (34) a. [[[nan]_v-[du_{3v}]_v]_n
 (categorial change)
 b. [[[nan]_v - {[du]_v]_v}]_n
 (extraction of participating argument)

What is interesting about this interpretation and representation is how it relates to the classical Bracketing Paradox. Note that X's unpredictability is X's quality of not being predictable. Thus, the only participating argument of this derived nominal has to be extracted from the predicate predictable, which is in an embedded bracket in both (33a) and (33b).

However, Morphological Transparency suggests that a morpholexical operation can access semantic information encoded on the locus of its application as well as on any constituent of the locus that underwent a morphological process. A consequence is that morpholexical processes can sometimes cross the (syntactically motivated) hierarchy of brackets. For instance, the subcategorization requirements of (33a) deal with the 'semantics' of the morpholexical rule. That is, it defines the way the meanings of all participants of the rule contribute to the meaning of the output of the rule. The nominalizer -ity takes a predicative argument, whose meaning is determined by the negation un- taking an adjectival argument.

Recall that Autonomous Morphology and Morphological Transparency predict that argument linking relations (and thus the subcategorization requirements) in a morpholexical process can always access a morphologically transparent unit regardless of the brackets created by the level ordering principles. Thematic structure of a stem, for instance, can usually be referred to in a morpholexical process regardless of how many brackets embedded it is. This is because a stem necessarily undergoes any previous morpholexical rules and hence is Morphologically Transparent. Thus the (33a) bracketing is superfluous (as is the (34b) bracketing). This is because the subcategorization requirement of the prefix un- can be satisfied in spite of the (33b) bracket since the stem predictable is Morphologically Transparent here. In other words, in spite of the phonologically motivated bracketing of (33b), un- can take either predictability or predictable as its argument because both of them are Morphologically Transparent. The NEG (predictable-ity) semantics is ill-formed and will be ruled out by type-mismatches, leaving the ITY (NEG (predictable)) interpretation available.

Similarly, the facts involving participating arguments in Chinese nominalization do not contradict the (34a) bracketing since the stem du is transparent in spite of the compounding and the nominalization bracketing. The extraction of participating arguments from either the tough morpheme nan or the base predicate du is allowed even with the (34a) bracketing since both of them are morphologically transparent. However, since a tough predicate only takes a propositional argument, it does not offer any plausible candidate for participating argument in nominalization (even though it itself is the target of the reference created by nominalization). Hence the participating argument has to come from the thematic structure of du, the other Morphologically Transparent element. It interesting to observe that this account also correctly predicts that nominalization of tough predicates does not work in English. This is because it applies to the simplex tough verb and has no place to extract participating arguments from. To summarize, many bracketing paradoxes are no longer paradoxes since morpho-phonological brackets do not post barriers to morpho-semantic processes which are only sensitive to Morphological Transparency.

V,B. Conclusion

In this paper, I proposed an Autonomous Morphology Hypothesis and the concept of Morphological Transparency. The proposal is motivated by the contrast in nominalization of tough predicates in English, Japanese, and Mandarin. I have shown that neither Rappaport's Thematic Constancy Hypothesis nor Saiki's Functional Constancy Hypothesis can account for the data in these languages. This paper follows and supports the basic TCH assumption that participating arguments in nominalization are extracted from thematic structures. However, Rappaport's version of TCH is too restrictive because it (wrongly) adopts the syntactic locality condition and takes into consideration only the argument structure governed by the predicate being nominalized. Saiki's attempt to account for the Japanese exceptions to TCH is also misleading because her FCH is based on the syntactic mechanism of dependency marking. The premise of my account is an autonomous morphology where conditions on morpholexical rules are defined strictly in terms of other morpholexical rules. Crucially, I define the Morphological Transparency of linguistic elements in terms of morphology, not syntax or semantics. The simple and straightforward stipulation that a linguistic element is Morphologically Transparent if and only if it is sanctioned by the application of other morphological rules, allows an account where both TCH and FCM failed. Thus, participating arguments in nominalization are determined by whether they are governed by a thematic structure encoded on the locus of the nominalization morphology or on its morphologically transparent constituents, not by syntactic hierarchy or phonological bracketing. Linguistic facts in other languages also support the proposal of Morphological Transparency. I showed that the same condition applies to other morpholexical processes, such as Chicheŵa causativization and Mandarin VR compounding. Additional facts discussed including Japanese case-as-signing nominals, and the Bracketing Paradox. Thus, the study of a lexical process without morphological marking yields support for the autonomy of morphology.

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