Ph.D. Dissertation of Linguistics

The Semantic Structure of Pluractionality

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Abstract

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This thesis organizes and presents a variety of pluractional types based on various semantic conditions reflecting characteristics of pluralized events, times, spaces, entities, and degrees, and argues that the pluractionality is valid to explain the significant semantic phenomena.

The pluractional types presented throughout this thesis have cumulativity as a semantic condition in common. A variety of interpretations are based on other semantic characteristics, where each of the base predicates has as a semantic condition with cumulativity. Throughout the thesis, this semantic property is described by different terminology: connectedness, unboundedness, repeatability, and extendability. This results from the fact that cumulativity occurs in different domains (e.g. events, times, spaces, entities, and degrees). These domains correspond to the different types of arguments required by a plural operator.

From this, a variety of interpretations (e.g. duration, repetition, continuation, incrementality, intensification, and argument plurality) can be ascribed to a variety of semantic environments satisfying its semantic condition. This thesis examines Korean pluractional phenomena such as the reduplicative adverbs *ta-tal-i* ‘month

by month' / *na-nal-i* 'day after day' / *halwu-halwu* '(from) day to day', the verbal derivational suffix -*keli*- / -*tay*-, the verbal complex with auxiliary verb *tayta* 'keep -ing', the predicate reduplication construction P-*ko* P '*predicate* and *predicate*', and the predicate reduplication P-*ti*-P '*predicate*-TI-*predicate*' .

The existing characteristics of pluractionality can cover the new data with an extended version. The internal/external distinction is extended from the domain of the event to other domains (e.g. P-*ti*-P 'P-TI-P' vs. P-*ko* P 'P and P' in the domain of degrees). In addition, an investigation of incrementality and intensification which are derived from pluractional markers confirms the extensibility of the domain which pluractional theory ranges over: from the event to the degree (e.g. scalar pluractionality).

This thesis introduces properties of mathematical logic to the semantic descriptions of individual lexical items, carries out comparisons between the lexical meanings, and then establishes a generalized property and several semantic subtypes of the pluractional phenomena. For this purpose, this thesis sets up various semantic environments and examines the semantic compositionality of pluractional markers. In the process, instances are reported in which modifiers as well as predicate arguments actively engage in aspectual composition (e.g. measure phrases, scalar phrases, and manner adverbs).

Keyword: pluractionality, event-internal pluractionality, scalarity, domain selections, reduplication, Korean

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Table of Contents

List of Figures

List of Abbreviations

A	adjective
ABS	absolutive case
ACC	accusative particle
ADD	additive particle
ADN	adnominalizer
ADV	adverbializer
ADV	adverb
CI	verbal suffix in long-form negation
CL	classifier
CNJT	conjectual modality
CNTR	contrastive marker
COMP	complementizer
CONJ	conjunctive ending
CONC	concessive particle or ending
COND	conditional conjunctive ending
COP	copula
CORN	cornitative case
DAT	dative case
DDi	*day-day*-adverbial suffix
DECL	declarative mood
DET	determiner
DIR	directional case
DIST	distributive marker
DSH	distributive share marker
ERG	ergative case
EVI	evidential modality
EXH	exhortative mood
GEN	genitive case
IND	indicative
IMP	imperative mood
INT	interrogative mood
INST	instrumental case
KELI	verbal derivational suffix *-keli-*
LOC	locative case
MMi	*month-month*-adverbial suffix
N	noun
NEG	negation
NEG.COP	negative copula
NOM	nominative case
NML	nominalizer
P	predicate
PERF	perfective aspect
PL	plural marker
PLR	pluractional marker
POSB	possibility modality
PRCD	preceding conjunctive ending
PROG	progressive aspect
PROPOS	propositive
PST	past tense
RED	reduplication
REPT	repetitive
SG	singular
SUCC	successive conjunctive ending
TAY	verbal derivational suffix *-tay-*
TERM	termination aspect
TI	intervening element in P-*ti*-P
TOP	topic
V	verb
VSFX	verbal derivational suffix
1D1D	1day-1day

1 Introduction

1.1 Research Aims

This thesis aims to present a new view on the semantic phenomena of *pluractionality* which are observed in natural languages.

The main phenomena of pluractionality is in connection with plural events. What counts as a plural event is the phenomena where more than two events are tied up together and are expressed at one time by means of a simple form (Bach 1986). For example, the sentence "*there was a surprise party for me every month*" expresses a number of events simply by using the adverbial *every month*, instead of stating a sequence of sentences like "*there was a surprise party for me in January*, *there was a surprise party for me in February*, ……, *there was a surprise party for me in December*" for events of the same type which occur repeatedly. For efficient communication, every language employs such a device to convey a large amount of information in a simple, straightforward form.

A study of plural events analyzes the semantic structure by formalizing and classifying complex meanings which are represented by expressions of plural events. A variety of expressions on plural events is associated with various types of meanings to be conveyed. For example, the sentence "*car accidents occur often*" refers to a plural event which is stretched out on the temporal axis; in contrast, the sentence "*car accidents occur at the same time*" refers to a plural event in which events occur simultaneously – at a certain point on the temporal axis. The

difference in meanings is distinguished by the expressions "*often*" and "*at the same time.*" In this way, each of the lexical meanings is represented by specifying more information to the fundamental meaning of plural events.

Besides pluralized events, pluractional phenomena are accompanied by a variety of characteristic meanings. When a linguistic element is reported as pluractional on the basis of its semantic characteristics, the question is what types of readings besides event plurality can be identified as pluractional. One characteristic of the pluractional phenomena is that one morphological marker (e.g. reduplication) brings about more than one type of reading. Initially, the event plurality of some maker vouches for other readings which are derived from the same marker as pluractional. Then, as a new type of pluractional reading, other linguistic elements are possibly accepted as a pluractional phenomenon even though there is no event plurality. In this way, pluractional phenomena have been extended to a variety of semantic characteristics.

(1) A new type of pluractional reading is introduced in cases where:

a. A linguistic element indicates event plurality; at the same time, it yields other types of readings that seem to be far from event plurality.

b. A linguistic element does not indicate event plurality, but it yields other types of readings which have been reported by other pluractional markers.

c. A linguistic element is irrelevant to the event, but it yields other types of readings which have been reported by other pluractional markers.

Also, dominant morphological characteristics of pluractional markers may provide a basis for the introduction of a new pluractional form, on the grounds that a structural similarity in the forms sometimes motivates a structural similarity in

the meanings. Mainly, reduplication and derivational affixation on the verbs have received attention as the most famous morphological forms in pluractional phenomena. Then, on the basis of major semantic characteristics which have been reported across these pluractional markers, various linguistic elements are introduced as pluractional forms. As a result, the types of pluractional phenomena have been extended from word-formation (e.g. affixations and reduplications) to syntactic constructions (e.g. adverbial modifications, verbal complexes with an auxiliary verb, and predicate repetition constructions).

In this regard, the term *pluractionality* goes beyond event plurality and verbal morphology. Pluractional readings are neither restricted to the 'plurality' of the events nor the 'events' themselves; pluractional markers are neither restricted to 'verb reduplication' nor 'affixation'. Then, it is possible to even introduce a new pluractional type with no similarity with the well-known existing types. It is a case where a new linguistic element yields a new type of reading which has not been reported.

Then, some issues arise: (i) which types of pluractional phenomena exist, (ii) whether these types of phenomena can be established as one semantic class, and (iii) whether the notion of pluractionality is still a valid semantic property to provide a unified explanation for a variety of meanings.

This thesis investigates these issues by establishing the different types of pluractionality. It focuses on the semantic operation of pluractionals by examining what a pluractional marker is composed of and what kinds of readings are derived from the composition. The strong semantic conditions of pluractionality which are identified through the data (reduplicative adverbs, verbal derivational affixes,

predicate reduplications, and so on) provide a basis for a variety of readings.

The semantics in this thesis present a typology of plural events and event composition constraints so as to ultimately establish the mathematical structure of the whole event domain. Also, a cross-linguistic study provides a typological explanation of the corresponding relationship between the meaning and the form by classifying linguistic forms and their construction patterns which derive the interpretations of plural events. A study of these plural events not only deepens our overall understanding of the domain of existence for events, but also provides a new perspective on existing semantics such as the domain of existence for entities, times, spaces, and degrees; therefore, it leads to a contribution to the development of the semantic theory in general.

1.2 Research Methodology

This study attempts to build a semantic theory on plural events which is applicable to various natural languages. For this purpose, I define a fundamental meaning on the basis of characteristics common to various expressions on plural events and then, at the same time, investigate the main types of plural events by examining differences. This comparative study is applied step by step from one type to its subtypes. Here, this thesis explains diverse aspects of semantic phenomena on plural events, by extracting basic elements which constitute a complex meaning of lexical entity and by describing these elements as generalized types by means of mathematical logic.

First, for this purpose, this study provides clear descriptions and an objective

analysis by means of mathematical logic, along with the 'compositional principle' of semantic interpretation, based on the methodology of formal semantics.

Second, this study also suggests a framework to comprehensively explain semantic phenomena which are observed cross-linguistically, from the perspective of general semantics. We apply an analysis to a number of languages and verify its expressive power. Through these processes, this thesis attains a generalized theory which explains semantic characteristics of individual languages.

Third, the data for this study were drawn mainly from examples in actual use for objectivity. For example, the Sejong Corpus (The National Institute of Korean Language, 2011)[1] was consulted. Note that a corpus study encounters 'data sparseness,' which indicates the phenomenon where a certain pattern is intuitively supposed to appear but is accidentally missing from data due to the limitations of the corpus. Therefore, this thesis makes use of the data in the corpus as positive evidence in order to confirm the example; however, the absence of data should not be considered as a negative evidence to conclude infelicity of example.

1.3 Outline of the Dissertation

The dissertation has been organized in the following way.

Chapter 2 provides a general background for the thesis. The notion of pluractionality is introduced with pluractional markers and their readings (2.1). Then, pluractional phenomena in Korean are overviewed in order to confirm the

[1] The Sejong Corpus (The National Institute of Korean Language, 2011) was estabalished as part of the 21st century Sejong Project.

object of study in this thesis (2.2). To provide the semantic foundation for the thesis, the semantic properties and aspectual classes are established from the previous literature review (2.3).

Chapter 3 shows that three reduplicative temporal adverbs *ta-tal-i* 'month by month', *na-nal-i* 'day after day' and *halwu-halwu* '(from) day to day' in Korean derive a certain type of 'plural events' as pluractional markers (3.1). Through examinations on various semantic environments, *tatali*, *nanali*, and *halwuhalwu* are defined as the BOUNDEDNESS, SCALAR CHANGE, and DIVISIVE-PATH conditions, respectively (3.2). Each adverb derives a different interpretation from the others based on its own semantic condition (3.3).

In Chapter 4, Korean verbal derivational suffixes *-keli-* / *-tay-* and verbal complex with auxiliary verb *tayta* 'keep -ing' are examined for identification as pluractional markers (4.1). The semantic conditions of *-keli-* and *-tay-* are defined as REPEATABILITY in common, and a variety of 'repetition' interpretations are based on a variety of lexical meanings across roots. Meanwhile, differences between *-keli-* and *-tay-* are discussed on their derived predicates (4.2). The analysis extends its application to verbal complex construction V-*e tayta* (4.3), and provides pluractionality as a unified semantics on various morphosyntactic levels (4.4).

Chapter 5 deals with two of many kinds of predicate reduplications in Korean: (i) predicate reduplication construction P-*ko* P '*predicate* and *predicate'* and (ii) the so-called 'adjective' reduplication P-*ti*-P '*predicate*-TI-*predicate'* (5.1). The relatively naive semantic condition of P-*ko* P 'P and P' are defined as CUMULATIVITY in common, and a variety of interpretations are based on semantic characteristics of base predicates (5.2). On the other hand, the strongly restricted

semantic condition of P-*ti*-P 'P-TI-P' are defined as STATIVITY and SCALAR CUMULATIVITY in common, and only a special 'intensification' reading is derived (5.3).

Chapter 6 summarizes and discusses the research results. The characteristics observed in Chapter 3-5 shows that the internal/external distinction is extended from the domain of event to other domains (6.1). Pluractional types presented through this thesis have the semantic condition CUMULATIVITY in common. A variety of interpretations are based on other semantic characteristics each of base predicates has as a semantic condition with CUMULATIVITY (6.2). The notion of scalar plurality analyzes 'degree-based' readings as one type of pluractionality. Especially, predicate reduplications P-*ko* P 'P and P' and P-*ti*-P 'P-TI-P' shows the internal/external distinction in the domain of degrees (6.3). Then, concluding remarks of the thesis are presented (7).

2 General Background

2.1 Pluractionality

In the early days, under the term *distributive affixes* or *verbal plurality markers*, descriptive works on various languages have reported mainly phenomena where some morphological marker on the verb yields a plural event (Lasersohn 1995). Distributive affixes or verbal plurality markers are used to refer to morphological markers on the verb which yield a plural event. These terms reflect the morphological or categorical characteristics of the words '*affixes*' and '*verbal*'.

(2) Evenki (Nedjalkov 1997:251)

ana- 'to push' → *ana-**kta***- 'to push several times'

The term *pluractional* has been first suggested in Newman (1980) as an alternative term in the sense of 'Plural Action'. Then, as a semantic phenomena, *pluractional* have included instances in which plural events occur with plurality on arguments and use it.

(3) Yup'ik (Jacobson 1984)

nere- 'to eat' → *ner**'qui*** 'he is eating them one after another'

Lasersohn (1995) proposes that *pluractionality* refers to plurality of events and that pluractional markers are elements that modify event-denoting expressions and yield a pluralized event. Therefore, the subjects of study on pluractional markers has been expanded from verbal affixes to other categories including adverbials.

(4) English

a. (Cusic 1981:65)

The mouse nibbled the cheese **again and again** on Thursday.

b. (Beck and von Stechow 2007:216)

Sally ate the cake **piece by piece**.

c. (Beck 2012:76)

Otto ran **and** ran.

Otto ran fast**er and** fast**er**.

d. (Henderson 2012:196)

John killed ants **two by two**.

The crack widened **inch by inch**.

For now, some researches delimit the pluractional phenomena only to morphological markers on verbs; on the other hand, others introduce more expressions on the various linguistic levels. Despite the diversity, the notion of pluractionality is commonly used throughout the semantic phenomena where a group of verbal meanings, with event plurality as the center, are observed.

2.1.1 Pluractional Markers and Their Meanings

Pluractional markers are observed with various types of meanings. Cusic (1981) proposes four parameters in (6) in order to cover a variety of readings in (5) observed from pluractional markers across languages.

(5) (Cusic 1981:74f)

repetitiveness, repeated occasions or events, persistent consequences, habitual agency, distributed quality, inchoativity, cumulative result, intensity, plurality

of sites of action, duration, continuity, conation, distribution, celerativity/retardativity, augmentation, diminution

(6) a. EVENT RATIO PARAMETER:

(i) Internal, "phase" repetition

(ii) External, "event" or "occasion" repetition

b. RELATIVE MEASURE PARAMETER: the relative size, effort, efficacy, etc., of the component actions in a complex event

c. CONNECTEDNESS PARAMETER: the degree of continuity among these actions

d. DISTRIBUTIVE PARAMETER: times, locations, or participants

Lasersohn (1995) gives a "skeleton" in (7) for an analysis of pluractional markers. For example, this skeleton of pluractionality illustrates three types of pluractionality, i.e. temporal, spatial, and participant-based pluractionality as in (8), based on the Distributive Parameter (6d) proposed by Cusic (1981). The skeleton in (7) is applied to each of the three types in such a way that the variable *f* for the type of function is assigned one of three functions – temporal trace function (τ), spatio-temporal trace function (K), and thematic function (θ) – as its value.

(7) (Lasersohn 1995:251-257)

$$\text{V-PA(X)} \Leftrightarrow \forall e,e' \in X[V(e) \;\&\; \neg f(e) \circ f(e')] \;\&\; \mathbf{card}(X) \geq n$$

(8) a. The bird is flying around **again and again**. (Temporal Pluractional Marker)

b. Many birds are flying around **here and there**. (Spatial Pluractional Marker)

c. Many birds are flying around **one by one**.

(Participant-based Pluractional Marker)

Temporal pluractionals yield a meaning where events are distributed over time intervals, where 'repetitiveness', 'repeated occasions or events', 'persistent

consequences', 'habitual agency', 'duration', and 'continuity' in (5) belong.

(9) a. Durative-continuative reading (Cusic 1981:87):

Yokuts (Newman 1944:37)

simwiyi 'drizzling' → sim**im**wiyi '<u>keep on</u> drizzl<u>ing</u>'

b. Duplicative reading (Cusic 1981:89):

Zoque (Wonderly 1951:157)

min- 'come' → min**geʔt**u 'he (the same) came <u>a second time</u>'

/ 'he (another) <u>also</u> came'

c. Alternative reading (Cusic 1981:90):

Tubatulabal (Cusic 1981:91)

loho'm 'enter' → **loho:m'**loho:ma't 'he goes <u>in and out</u>'

Spatial pluractionals yield a meaning where events are distributed over spaces, where 'plurality of sites of action' in (5) is included.

(10) a. Dispersive reading (Cusic 1981:92):

Yuma (Cusic 1981:92)

axwelyk 'he digs' → axw**a:**lyk 'he digs <u>here and there</u>'

Participant-based pluractionals yield a meaning where events are distributed over participants of those events, where 'distribution' in (5) is included.

Pluractional markers are often mapped to more than one type of readings. For example, partial reduplication (11b) in Hausa shows readings related to temporal or spatial distributions in (12a-c). Spatially distributed events in (12b) are observed as a dispersive reading (such as 'plurality of sites of action' or 'distribution' in (5)); temporally distributed events in (12b) are observed as a repeated reading ('repeated occasions or events'). The sentence in (11b) is not true in cases where there is

neither temporal nor spatial distribution, as in (12d).

(11) Hausa (Eulenberg 1971, cited from Corbett 2000:246)

a. naa aikee su
I send them

b. naa **a”**aikee su
I send.PL them

(12) a. Spatial distribution: ‘I sent them at the same time to different places’

b. Temporal distribution: ‘I sent them at different times to the same place’

c. Temporal and spatial distribution: ‘I sent them at different times to different places’

d. # ‘I sent them at the same time to the same place’

Among (12), (12c) is particularly worthy of notice – the pluractional marker yields a spatio-temporal pluractional reading, which indicates that the marker indicates both temporal and spatial distributions at the same time. This reading shows that the pluractional types on the distributive parameter are not in complementary relations. More than one type of pluractional reading can compose a complex type of pluractional reading, like a spatio-temporal pluractional reading where events are distributed over space as well as time.

In this connection, Lasersohn (1995:252) mentions that often when a pluractional marker indicates that events are distributed over space, the events are also distributed over time. He represents the “distributed in time-or-space” reading by making use of a spatio-temporal trace function (K) – a 2-tuple of time trace function (τ) and space trace function (σ) – as in (13).

(13) (Lasersohn 1995:252)

$$\text{V-PA}(X) \Leftrightarrow \forall e,e' \in X[V(e) \,\&\, \neg K(e) \circ K(e')] \,\&\, \mathbf{card}(X) \geq n$$

$$(K(e) = \langle \tau(e), \sigma(e) \rangle)$$

Meanwhile, some pluractional markers show a behavior where the pluractional reading varies with stems. For instance, Nuxalk (a Salish language spoken by the Nuxalk people), also known as Bella Coola (because today it is spoken only in the Canadian town of Bella Coola, British Columbia), has a pluractional affix as in (14). This pluractional affix yields different readings as it is attached to different stems. Based on the Distributive Parameter, 'locative distributivity' in (14a) corresponds to a spatial pluractional reading and 'collectivity' in (14b) corresponds to a participant-based pluractional reading.

(14) Bella Coola (Haji-Abdolhosseini et al. 2002:482)

a. Locative Distributivity (Nater 1990)

piiχla	piiχla-naw	ʔ**ix**-piiχla-naw
adrift	adrift-they	DIST-adrift-they
'be adrift'	'they are adrift'	'they are floating around'

b. Collectivity (Davis and Saunders 1980)

ʔlq-is	ʔlq-m-s	ʔ**ix**-ʔlq-m-aw
think-it/he	think-MP-3SG	DIST-think-MP-they
'he thinks about it'	'he thinks'	'they thought over'

c. Intensivity (Nater 1990)

ʔnχ	ʔnχ-s	ʔ**ix**-nχ-s
dark	dark-3SG	DIST-dark-it
'dark, night'	'it is dark/night'	'it is very dark'

However, 'intensivity' in (14c) is not covered in terms of the Distributive Parameter in (6) or three types of function in (7). Although it is far from indicating pluralized events, this kind of reading is often observed from pluractional markers. Examples in (15) shows intensive and attenuative readings.

(15) a. Intensive reading (Cusic 1981:84):
Náhuatl (Garibay Kintana 1961:31; cited from Lasersohn 1995:246)
tlania 'to ask' → **tla**tlania 'to ask insistently'

b. Attenuative reading
Mauritian (Henri 2012:219)
ennjoy 'enjoy' → **ennjoy**-ennjoy 'somewhat enjoy'

The same is true of augmentative/diminuative readings and excessive/tentative readings, as in (16) and (17).

(16) a. Augmentative reading (Cusic 1981:85):
Luiseño (Jacobs 1975:95; cited from Lasersohn 1995:246)
cori 'to cut' → cori**i** 'to do a lot of wood-cutting'

b. Diminuative reading (Cusic 1981:84):
Sierra Nahuat (Key 1960:131)
koči.sneki 'wants to sleep' → **ko**.koči.sneki 'continually wants to catch little naps'

(17) a. Excessive reading (Cusic 1981:86):
Dyirbal (Dixon 1972:251; cited from Lasersohn 1995:246)
balgan 'hit' → **bal**balgan 'hit too much'

b. Tentative reading (Cusic 1981:82f):

Quileute (Andrade 1933/1938:190; cited from Lasersohn 1995:245)

ce:'gol 'he pulled' → c**iv**e:gol 'he pulled a little'

Another reading is the gradual/incremental reading (van Geenhoven 2004; Beck 2012; Henderson 2012).

(18) Gradual reading:

West Greenlandic (Fortescue 1984:282)

Alli**galuttuinnar**poq. 'He is getting bigg**er and** bigg**er**'

Henderson (2012) deals with incremental readings as 'degree-based pluractionality' in that events are distributed over degrees. If the term 'degree-based pluractionality' is used for readings of pluractional markers which are related to degree, it might be extended to include intensive/attenuative readings, augmentative/diminuative readings, and excessive/tentative readings.

Additionally, there are many other types of readings which seem not to indicate pluralized events, as in (19) and (20).

(19) a. Cumulative reading (Cusic 1981:86):

Pomo (Moshinsky 1974:46; cited from Lasersohn 1995:246)

q̇wo 'to cough' → **q̇wo**q̇wot 'to cough something up'

b. Conative reading (Cusic 1981:83):

Saho (Tauli 1958:141; cited from Lasersohn 1995:245)

barar 'to fly' → ba**r**rar 'to flap the wings in the effort to fly'

(20) a. Intentive reading:

Niuean (Gould, Massam, and Patchin 2009:10)

manava 'to hit' → **faka**manava 'to hit intentionally'

b. Incassative reading (Cusic 1981:83f):

Zoque (Wonderly 1951:157)

wit 'to walk' → wit**witnay** 'to walk aimlessly'

Likewise, so-called pluractional readings correspond to a collection of readings which have been reported from pluractional phenomena. Whether some phenomenon is pluractional or not is commonly determined mainly by means of event plurality. Once some marker is established as pluractionals, other types of readings derived from this marker are dealt with as pluractional readings like event plurality.

In this regard, Součková (2011) excludes from pluractional phenomena a marker which consistently refers to only one type of reading, such as *aspect* and *argument plurality*. Unlike van Geenhoven's (2004) analysis, Součková (2011) argues that grammatical aspectual markers need not to be dealt with as pluractional. This kind of perspective would consider a marker not to be a pluractional one even in cases where it yields only one type of reading such as spatial-and-non-temporal distribution and intensification. The matter is whether we should exclude a marker with only one type of reading even though it is a typical pluractional reading. Otherwise, if we do not adhere to the definition that a marker should yield various *verbal* readings, then what is the pluractionality should be re-established as a common trait to cover different types of markers, from event plurality markers to intensification markers.

2.1.2 Event-internal vs. Event-external pluractionality

Meanwhile, with regard to Cusic's (1981) event ratio parameter, Lasersohn

(1995) stipulates that event-internal pluractional markers have the same structure as event-external pluractional markers, where the only difference between the two structures is the introduction of another type of predicate P, as in (21), instead of the base predicate X.

(21) (Lasersohn 1995:251-257)

$$\text{V-PA}(X) \Leftrightarrow \forall e,e' \in X[\mathbf{P}(e) \ \& \ \neg f(e) \circ f(e')] \ \& \ \mathbf{card}(X) \geq n$$

However, this stipulation is rejected by following studies, such as Wood (2007) and Tovena (2010), which state that event-internal pluractionality shows its own properties distinct from event-external pluractionality and Lasersohn's formula is not sufficient to show these properties. They have proposed a pair of contrastive concepts in various levels in order to explain the fundamental difference between event-internal and event-external pluractionality.

(22) Event-internal vs. Event-external Distinction (Henderson 2012)

A Phase in an Event	**An Event / Occasion**
◆ Aspectual Selection for Semelfactive and Achievements	◆ Aspectually Promiscuous
◆ Contiguous Repetitions	◆ Non-contiguous Repetitions
◆ One Occasion	◆ Habitual (Occasion) Readings
◆ High Cardinality	◆ Low Cardinality
◆ Shared Telos or Theme	
◆ Failed Entailments to the Base Predicate	◆ Entailments to the Base Predicate

(23) Yurok (Wood 2007:151,143)

a. *pegon-* → ***peg****pegon-*

'to split' 'to split <u>in several places</u>' (like making kindling)

b. *nep-* → *ne**ge**p-*

'to eat' 'to eat <u>regularly</u>'

The follow-up studies have been on-going, observing specific types of pluractionality from various cross-linguistic data, improving the theory (Yu 2003, Beck and von Stechow 2007, Wood 2007, Müller and Sanchez-Mendes 2008, Součková 2011, Schultze-Berndt 2012, Cable 2014, Henderson 2012, Hofherr and Laca 2012, Ward 2012, among others).

This thesis introduces newly-discovered specific semantic phenomena as well as cross-linguistic pluractionality with special reference to Korean. A study of pluractionality in Korean corresponds to recent trends on the extension of the research area from the nominal to the verbal domain, in that plural phenomena in Korean are obtained in adverbs, affixes, and auxiliary verbs. This leads to an expansion of the semantic theory into new areas of research and provides criterion to examine the previous theories.

2.2 Pluractional Phenomena in Korean

The characteristic pluractional phenomena which have been reported from the famous pluractional languages are provided as criteria for similar phenomena which others languages show in terms of form and/or meaning. Since pluractional phenomena vary by language, some languages have a developed pluractional system while other languages seldom do. Wood (2007) provides a definition of

pluractional marker as "closed-class constructions which apply to a verbal head and which produce an expression of event plurality." In this definition, pluractionality is restricted to "grammaticalized" categories. Under this definition, Wood's (2007) survey classifies Korean as a language which shows marginal pluractionality.

(24) How extensively languages indicate grammaticalized pluractionality

a. No pluractionality: languages with no apparent verbal plurality

b. Marginal pluractionality: languages with one or more grammaticalized pluractionals which are used rarely, primarily for stylistic effect, or with a limited class of verbs, or which are highly lexicalized or produce pluractional meaning with only a small subset of verbs

c. 1 or 2 pluractionals: languages with one or two productive grammaticalized means of expressing pluractionality which appears to be used with some frequency

d. >2 pluractionals: languages with two or more such categories

In Korean, plurality can be marked by means of suffixes such as -*tul*, -*ney*, and -*huy*, or with reduplication as in *cip-cip* 'house-house' and *kos-kos* 'place-place' (Jun 2007:325).

2.2.1 Plural Derivational Marker -*tul* and its Pluractionality

In Korean, there are suffixes that appear after nominals and yield plurality: -*tul*, -*ney*, and -*huy*. Even though they differ from one another in details, all of them refer to plural entities of the nominal which each attaches to. Nominals with these markers may be involved in plurality of event when they are used as a verbal

argument of verb (Jeong 2010); however, these markers do not necessarily bring about event plurality. The sentence in (25) is true in contexts with a single piano-lifting event.

(25) ai-**tul**-i takathi phiano-lul tul-e olly-ess-ta.
child-**PL**-NOM all.together piano-ACC lift-CONJ raise-PST-DECL
'Children lifted the piano all together'

However, the plural marker -*tul* in Korean has another usage directly related to event plurality. Unlike other plural markers, -*tul* can attach not only to nominals but also other components in the sentence (Choi H-B 1937/1959:231f; Ramstedt 1939:35; Im 2000; Jun 2007:325). -*tul* shows a variety of distributions: it may appear after postpositions, adverbs, and even the sentential ending (26a), but not crucially everywhere (26b).

(26)[2] (Jun 2007:327)

a. cikwen-tul-i keli-eyse(-**tul**) selo-eykey(-**tul**)
worker-PL-NOM street-LOC(-PL) each.other-DAT(-PL)
insa-lul(-**tul**) cal(-**tul**) hay-yo(-**tul**).
greeting-ACC(-PL) well(-PL) do-DECL(-PL)
'The workers say hello to each other well in the street'

b. cikwen-tul-i saylowun{*-**tul**} aitie(-tul)-ul ceyanhay-ss-ta.
worker-PL-NOM new{-PL} idea(-PL)-ACC suggest-PST-DECL
'The workers suggested the new idea'

[2] For Korean examples which are cited from other studies, all the glosses and interpretations are provided additionally in this thesis.

Im (2000) and Jun (2007) use the term 'direct plural markers' for ones attached to nominals and the term 'indirect plural markers' for ones attached to constituents other than nominals. They give a unified explanation for both types. Im (2000) argues that *tul*-plural forms are used for individuality, and Jun (2007) analyzes *tul*-plural forms as distributive markers.

The plural marker -*tul* is non-obligatory for plurality, but it is not simply optional (Jun 2007:325). For direct plural marker -*tul*, Jun (2007) proposes that the ∅-plural form is employed for collectivity, while the *tul*-plural form is used for distributivity. According to Jun (2007), the direct plural marker -*tul* in Korean indicates an identification of atomic entities as well as a distinction between the group of entities and the sum of entities, which is different from other plural markers which express only a distinction between singular entity and plural entity (e.g. English plural marker -(*e*)*s*). Then, Jun (2007) applies the same analysis to indirect plural marker -*tul*: it shows non-atomic plurality in the event domain.

The indirect plural marker requires a plural licensor (Lee H-G 1992), and a plural form with the direct plural marker -*tul* acts as a licensor of the indirect plural marker (Jun 2007). In addition to a syntactic subject with the nominative case as in *cikwen-tul* 'workers' (27a), the licensor of -*tul* can appear as an object argument with accusative case (28a) or dative case (28b) (Lee H-G 1992, Im 2000, Jun 2007, Park J-U 2009 and among others). It may also be a topic as in (29) (Im 2000:23).

(27) a. (Jun 2007:327)

cikwen-<u>tul</u>-i	ilccik-**tul**	chwulkunhay-yo.
worker-PL-NOM	early-PL	get.to.work-DECL

'Workers come to work early (respectively)'

b. *cikwen-i ilccik-**tul** chwulkunhay-yo.
worker-NOM early-PL get.to.work-DECL
Intended: '{a/the} worker come to work early (respectively)'

(28) a. (Jun 2007:327)
ku kyengchal-i ai*(-tul)-ul cip-ey-**tul** ponay-ss-ta.
that police-NOM child(-PL)-ACC house-LOC-PL send-PST-DECL
'The police officer sent the kids to the house (respectively)'

b. (Lee H-G 1992:48)
nay-ka ai*(-tul)-eykey ton-ul-**tul** cwu-ess-eyo.
I-NOM child-PL-DAT money-ACC-PL give-PST-DECL
'I gave the money to kids (respectively)'

(29) (Im 2000:40)
salam-tul-un chelswu-ka manhi-**tul** manna-ss-ta.
person-PL-TOP C.-NOM a.lot-PL meet-PST-DECL
'As for the people, Cheolsu met them many times (respectively)'

In addition, the licensor of the indirect plural marker -*tul* is not restricted to the noun with the -*tul* suffix. The licensor can be suffixed with other plural markers such as -*huy* (30a) and -*ney* (30b); it can be also a group noun as in (30c).

(30) a. ne-huy-nun kkok tosekwan-eyse-**tul** manna-te-la.
you-PL-TOP surely library-LOC-PL meet-EVID-DECL
'You (pl.) always meet in the library in (small) groups'

b. Mina-ney-nun kkok tosekwan-eyse-**tul** manna-te-la.
M.-PL-TOP surely library-LOC-PL meet-EVID-DECL
'Mina's group always meets in the library in (small) groups'

c. yeph thim-un kkok tosekwan-eyse-**tul** manna-te-la.
side team-TOP surely library-LOC-PL meet-EVID-DECL
'The neighboring team always meets in the library in (small) groups'

Furthermore, we can see that the licensor follows the indirect plural marker *-tul*. In (31), the licensor *cha-tul-i* 'cars (nom.)' needs not to linearly precede the indirect *-tul* marker *aph-ey-**tul*** 'in front of – pl.'.

(31) a. ancensen-ul aph-ey-**tul** twu-ko cha-tul-i memchwese-ss-ta.
safety.line-ACC front-LOC-PL put-CONJ car-PL-NOM stop-PST-DECL
'Cars stopped right in front of the safety line (each car is facing the line)'

b. cha-tul-i ancensen-ul aph-ey-**tul** twu-ko memchwese-ss-ta.
car-PL-NOM safety.line-ACC front-LOC-PL put-CONJ stop-PST-DECL
'Cars stopped right in front of the safety line (each car is facing the line)'

To summarize, indirect plural marker *-tul* functions as a grammatical marker referring to pluractionality. The type of pluractionality is identified (i) as participant-based distribution of event in terms of the requirement on the plural licensor and (ii) as event-external pluractionality in terms of individuality of event consisting of plural events.

2.2.2 Reduplication in Korean

Reduplication is a very productive word-formation in Korean, which is captured characteristically in the class of onomatopoeia and mimetic words. These kinds of onomatopoeia and mimetic words are categorized as adverbs in themselves. Also, some reduplicated forms from this class are used as a base form for affixation to

form adjectives and verbs.

(32) a. otok-otok ‘crunching repeatedly’, wakul-wakul ‘clamorously, in a boisterous manner’, cwuleng-cwuleng ‘(hang) in clusters’, panccak-panccak ‘twinkling, glittering, sparkling’, memchis-memchis ‘hesitatingly’, nolus-nolus ‘yellowish, spotted with yellow’

b. panccak-panccak-ha-ta ‘twinkle, glitter, sparkle’, mikkul-mikkul-ha-ta ‘be slippery’, khwung-khwung-keli-ta ‘thump’

Besides onomatopoeia and mimetic words, reduplication is also widely applied to form common nouns and adverbs. Some reduplicative adverbs as in (33b′) are formed as N(oun)-N(oun)-*i*, in which the -*i* is a suffix for deriving adverbs.

(33) a. hana-hana ‘one by one’, swunkan-swunkan ‘moment by moment’, kaci-kaci ‘various kinds’, sayngkim-sayngkim ‘looks’, toym-toym-i ‘personality’, ssum-ssum-i ‘spending’

b. acwu-acwu ‘very, very’, ka-ka-ho-ho ‘from house to house’, sa-sa-ken-ken ‘every single thing’

b′. al-al-i ‘grain by grain’, khan-khan-i ‘room by room’, ssang-ssang-i ‘pair by pair’

When reduplicative adverbs are subcategorized in terms of the meaning of the reduplicated root, several classes of semantic domains are captured, such as numerals, spaces, and individual (units). Along with these types, temporal expressions also form several reduplicative adverbs. There are many temporal expressions that can appear as a root of a reduplicative adverb.

(34) a. halwu-halwu ‘day by day/(from) day to day’, cacwu-cacwu ‘ever so often’, tumwun-tumwun ‘now and then/occasionally’, sai-sai ‘in spare moments’, yen-nyen ‘year {by/after} year’

b. na-nal-i ‘day {by/after} day’, ta-tal-i ‘month {by/after} month’, chel-chel-i ‘from season to season’, yen-nyen-i ‘year {by/after} year’, thum-thum-i ‘in spare moments’, ccam-ccam-i ‘in spare moments’, kan-kan-i ‘sometimes/from time to time’, pen-pen-i ‘time after time/all the time’

2.2.3 Pluractional Phenomena in the Verbal Domain

As mentioned above, Wood (2007) defines pluractional markers as “closed-class constructions which apply to a verbal head and which produce an expression of event plurality.” In Korean, besides one “grammaticalized” pluractional marker *-tul*, there are other types of pluractional phenomena, “which are highly lexicalized or produce pluractional meaning with only a small subset of verbs (in Wood’s (2007) terms).”

This thesis deals with three reduplicative adverbs in (35), two verbal derivational suffixes and one auxiliary verb in (36), and two predicate reduplications in (37). These phenomena show a variety of pluractionality based on their ‘highly lexicalized’ semantic conditions and interpretations.

(35) a. capci-ka **<u>ta-tal-i</u>** palkantoy-ess-ta.
journal-NOM month-month-ADV be.published-PST-DECL
‘{A/The} journal was published monthly’

b. ku-uy pyengsey-ka **na-nal-i** cohacy-ess-ta
he-GEN sickness-NOM day-day-ADV get.better-PST-DECL
'His condition got better day by day'

c. **halwu-halwu** tallaci-nun epmwu hwankyeng
1day-1day become.different-ADN work environment
'a work environment that changes from day to day'

(36) a. Mina-ka nwun-ul kkampak-**keli**-ess-ta.
M.-NOM eye-ACC blinking-**V.SFX**-PST-DECL
'Mina blinked her eye(s) (repeatedly)'

b. Mina-ka nwun-ul kkampak-**tay**-ss-ta.
M.-NOM eye-ACC blinking-**V.SFX**-PST-DECL
'Mina kept blinking her eye(s)'

c. Mina-ka mom-ul huntul-**e** **tay**-ess-ta.
M.-NOM body-ACC shake-CONJ **REPETITIVE**-PST-DECL
'Mina kept shaking herself'

(37) a. ku-nun keli-lul ket-**ko** **tto** kel-ess-ta.
he-TOP street-ACC walk-and again walk-PST-DECL
'He walked and walked on the street'

b. kaul hanul-i noph-**ti**-noph-ta.
autumn sky-NOM high-TI-high-DECL
'The autumn sky is very high (lit. The sky of autumn is high and high)'

2.3 Semantic Foundations

This section introduces the semantic notions which are used throughout this thesis. The semantic properties in Section 2.3.1 are applied to represent various

semantic conditions of pluractionality throughout Chapters 3-5. The characteristics of scale in Section 2.3.2 provides the basis for analyzing degree-based pluractional readings. Aspectual classes in Section 2.3.3 are provided as criteria to examine aspectual selections of pluractionals.

2.3.1 The Semantic Properties

Cumulativity

Cumulativity is a property to allow cumulative reference in denotation, which was suggested by Link's (1983) on the mass / count distinction in the nominal domain.

(38) A predicate X is cumulative (allows cumulative reference) iff:

$\exists x \exists y[X(x) \wedge X(y) \wedge \neg\, x = y \wedge \forall x \forall y[X(x) \wedge X(y) \rightarrow X(x \oplus y)]]$

($\oplus$ is the summing operation.)

"X is cumulative if and only if two distinct elements x and y are in X , the sum of x and y are also in X."

(39) Cumulative

a. Mass: $water(x) \wedge water(y) \rightarrow water(x \oplus y)$

If x is water, y is water, and there is no overlapping part between x and y, then the sum of x and y is water as well.

b. Bare plural: $dogs(x) \wedge dogs(x) \rightarrow dogs(x \oplus y)$

If x are dogs, y are dogs, and there is no overlapping part between x and y, then the sum of x and y are dogs as well.

(40) Non-cumulative

a. Singular: a dog(x) $\wedge$ a dog(x) $\nrightarrow$ a dog(x$\oplus$y)

If x is a dog, y is a dog, and there is no overlapping part between x and y, then it is not the case that the sum of x and y is a dog.

b. Quantized: three dogs(x) $\wedge$ three dogs(x) $\nrightarrow$ three dogs(x$\oplus$y)

If x are three dogs, y are three dogs, and there is no overlapping part between x and y, then it is not the case that the sum of x and y are three dogs.

Rothstein (2008) mentions that the cumulativity is introduced into the verbal domain by Krifka (1992, 1998)[3], but points out that the definition in (38) does not work straightforwardly for the contrast between atelic and telic meanings in (41).

(41) (Rothstein 2008:180)

a. If John ran from 13.00 to 14.00 and he ran again from 14.00 to 15.00, then he also <u>ran</u> from 13.00 to 15.00. (= cumulative)

b. If John ate (exactly) three apples between 13.00 to 14.00 and then he ate (exactly) three apples between 14.00 and 15.00, then it is not the case that he <u>ate exactly three apples</u> between 13.00 and 15.00.

She ascribes this to the absence of an obligatory plural marking system on the verbal predicate, as in (42). The summing operation applies to singular entities and then gives pluralities as output, but verb phrases denote sets which include both

[3] Krifka (1998) uses the signs = for 'equal to' and $\oplus_P$ for a summation operator in the part structure.

(i) $\forall X \subseteq U_P[CUM_P(X) \leftrightarrow \exists x,y[X(x) \wedge X(y) \wedge \neg\, x = y] \wedge \forall x,y[X(x) \wedge X(y) \rightarrow X(x \oplus_P y)]]$

Egg (1995:324) uses the sign $\cup$.

(iii) $\forall P[\mathbf{CUM}(P) \leftrightarrow \forall x \forall y(P(x) \wedge P(y) \rightarrow P(x \cup y))]$

singular and plural events. This results in the same verb phrase denoting both sums of singulars and sums of plurals in the denotation of a verb phrase, regardless of telicity.

(42) (Rothstein 2008:181)

a. Who ate three apples? John and Mary ate three apples. (In all six apples were eaten)

b. Mary ate three apples twice. (In all six apples were eaten).

In short, whether the result of summation is denoted by the same predicate or not fails to show a distinction between *run* and *eat three apples*. Rather, she focuses on the intuition that the result of the summation of two activity events can be treated as a new singular event, not just as a sum (or plurality), as in (43).

(43) (Rothstein 2008:181)

a. If John ran from 1pm to 2pm and then from 2pm to 3pm, then there is a singular event in the denotation of John run which lasted from 1pm to 3pm.

b. If John ate exactly three apples between 1pm and 2 pm and then again between 2pm to 3pm, then the sum of these events cannot be formed into, or conceptualised as, a singular event in the denotation of eat three apples.

Based on this intuition, Rothstein (2008:182) suggests S-cumulativity as the formal property which captures the distinction between atelic and telic predicates in the verbal domain.

(44) Rothstein's (2008:182) *S-cumulativity* (for singular cumulativity)

$\exists e \exists e'[X(e) \wedge X(e') \wedge \neg\, e \sqsubseteq e' \wedge \forall e \forall e'[X(e) \wedge X(e') \wedge \mathbf{R(e,e')} \rightarrow X({}^{S}(e \sqcup e'))]]$[4]

"A predicate X is S-cumulative if any two distinct instances of X related by the 'R' relation can be summed, and the sum formed into a singular entity which is itself in the denotation of X."

The set of activities and states are closed under the operation of S-cumulativity. Accomplishments and achievements denote sets which are not closed under S-cumulativity.

Divisivity

Subinterval property (Bennett and Partee 1972; Moltmann 1991, 1997; Link 1991; Champollion 2010; Henderson 2012) is one of the properties introduced in order to sort verb phrases into three classes ('stative verb phrases', 'subinterval verb phrases', and 'nonstative, nonsubinterval verb phrases') in Bennett and Partee (1972). This property was originated to target the 'subinterval verb phrases' such as *walk*, *breathe*, *walk in the park*, *push a cart*.

(45) Bennett and Partee's (1972) subinterval property (Henderson 2012:80)

$\mathrm{SUB}(P) :\Leftrightarrow \forall i\, [\, \mathrm{AT}(P, i) \rightarrow \forall j[\, j < i \rightarrow \mathrm{AT}(P, j)]]$

P has the subinterval property just in case if *P* holds at *i* it holds at every subinterval of *i*.

[4] Rothstein (2008:182) notes that the R relation in the definition of S-cumulativity corresponds to temporal adjacency in cases where events are concerned but that the R relation is not temporal adjacency in the nominal domain (discussed in Rothstein (2004, chapter 7)).

Ironically, however, the subinterval property is too strong to capture the class of atelic predicates. Most atelic predicates have subintervals of events which are not held by the predicate (Henderson 2012:80). Activity predicate *waltz*, exemplified by Dowty (1979), consists of a unit of three stepping motions. One of the three stepping motions is still a part of waltzing event, but *waltz* does not hold at less than three stepping motions. Most atelic predicates have a minimal part at which the predicate holds, so that they are excluded, in terms of the definition of subinterval property. This is *the minimal parts problem* (Dowty 1979). For this minimal parts problem, some studies such as Moltmann (1991, 1997), Link (1991) and Champollion (2010) leave activity predicates on the subinterval side and modify the definition of subinterval property by restricting the size of a subinterval to the extent that the predicate holds at, as bolded and underlined parts in (46)-(48).

(46) Moltmann's (1991, 1997) subinterval property (Henderson 2012:81)

$\mathrm{SUB}(P) :\Leftrightarrow \forall e, t\ [\ P(\mathrm{e}) \wedge \boldsymbol{\tau(e) = t} \rightarrow \boldsymbol{\forall t'\ [t'\mathrm{R}t}} \rightarrow \exists e'\ [e' \leq e \wedge \mathrm{P}(e') \wedge \tau(e') = t']]$

Suppose that t is the trace of a P event. P has the subinterval property just in case all t' that are <u>relevant parts of a t</u> are traces of P events.

(47) Link's (1991) subinterval property (Henderson 2012:81)

$\mathrm{SUB}(P) :\Leftrightarrow \forall e, t\ [\ \mathrm{P}(e) \wedge \boldsymbol{t < \tau(e) \wedge |\ t\ | > \gamma(e)} \rightarrow \exists e'\ [e' \leq e \wedge P(e') \wedge \tau(e') = t]]$

Suppose that e is a P event with trace t, P has the subinterval property just in case all parts of t <u>longer than $\gamma(e)$</u> are traces of P events.

(48) Champollion's (2010) subinterval property (Henderson 2012:81)

$\mathrm{SUB_K}(P) :\Leftrightarrow \forall e\ [\ P(e) \rightarrow e \in {*}\lambda e'\ [(P(e') \wedge \boldsymbol{\epsilon(K)(\tau(e'))})]]$

Suppose that e is a P event. P has the subinterval property relative to interval K just in case e can be exhaustively divided into <u>short parts (those satisfying $\in K$)</u>

that satisfy *P*.

This subinterval property has been dealt with as another name, *divisivity*.

(49) a. (Egg 1995:324)

$\forall P[\mathbf{DIV}(P) \leftrightarrow \forall x \forall y((P(x) \wedge y \subseteq x) \rightarrow P(y))]$

b. (Scheiner 2003)

A predicate is divisive if its extension is closed under **partitioning** of entities.

c. (Csirmaz 2007)

A predicate *P* is divisible

iff whenever $P(x)$ for an argument x, then for all $y \subseteq x$, $P(y)$.

Cumulativity and divisivity are usually dealt with together as a set, which corresponds to *homogeneity*. If some x is homogeneous, then it is both cumulative and divisive. For example, mass nouns in the nominal domain are homogeneous. Henderson (2012:69) describes stative predicates in the verbal domain as well as mass nouns in the nominal domain not just as cumulative but also as homogenous (51).

(50) (Borer 2005:49)

a. *P* is *homogeneous* iff *P* is *cumulative* and *divisive*.

(i) *P* is *divisive* iff for all *x* with property *P* there is a *y*, proper subset of *x*, with property *P*, such that subtracting *y* from *x* yields a set with the property *P*.

P is cumulative iff

$\forall x\ [P(x) \rightarrow \exists y(P(y) \wedge y < x)] \wedge \forall x,y[P(x) \wedge P(y) \wedge y < x \rightarrow P(x\text{-}y)]$

(ii) *P* is *cumulative* iff $\forall x\ [P(x) \wedge P(y) \rightarrow P(x \cup y)]$

b. *quantity*: *P* is *quantity* iff *P* is not *homogenous*.

(51) (Henderson 2012:70)

$\forall x[P(x) \rightarrow \exists y \exists z[y \leq x \wedge z \leq x \wedge \neg(y \circ z) \wedge P(y) \wedge P(z)]]$

'*P* is homogenous just in case all *x* in *P* have at least two non-overlapping parts in *P*.'

Meanwhile, *quantization* (Krifka 1998; Champollion 2010:19) is defined by 'no proper part'. However, Borer (2005:50) proposes the definition of *quantity* only as non-divisivity. By this definition, a reference is quantative even if it is cumulative, but it is non-divisive; then, *more than three apples* is cumulative but quantative.

(52) (Krifka 1998)

$\forall X \subseteq U_P\ [\mathrm{QUA}_P(X) \leftrightarrow \forall x,y[X(x) \wedge X(y) \rightarrow \neg\, y <_P x]]$

(53) (Champollion 2010:19)

$\mathbf{QUA}(P) =_{\mathrm{def}} \forall x[P(x) \rightarrow \forall y[y < x \rightarrow \neg P(y)]]$

A predicate *P* is quantized iff whenever it holds of something, it does not hold of any its proper parts.

Atomicity

Rothstein (2010) distinguishes three kinds of atomicity: (i) formal atomicity (a property of Boolean algebras generated by a set of atoms), (ii) natural atomicity (inherently individuable and cognitively salient as individuals), and (iii) semantic atomicity: characterizing singular count predicates.

(54) Natural atomicity (Rothstein 2010:373)

If *N* is a naturally atomic predicate then:

$\forall x \forall k \forall k'[x \in \pi_1(N_k) \wedge x \in \pi_1(*N_{k'}) \rightarrow \pi_1(N_{k'})$

'If *N* is naturally atomic, then for any two contexts *k* and *k′*, if *x* is an atom of

N_k, and x is in the denotation of $N_{k'}$, x is also an atom in $N_{k'}$.'

Natural atomicity make a division between naturally atomic count nouns (*boy*, *pencil*, *cat*) and homogeneous nouns (*fence*, *wall*, *sequence*, *quantity*, *bouquet*). The latter predicates have no natural atomicity and the set of (formally) atomic entities vary by context.

2.3.2 Scale

A scale is the totally (ordered) set of degrees. The structural variations in scales are parameterized in terms of some different structural features: (in)finiteness, density – denseness/discreteness –, boundedness – whether it contains minimal or maximal elements or not –, and so forth (Kennedy and McNally 2005:352).

First, a scale is either finite or infinite. If a set of degree consists of finite members, the number of members is fixed. For example, a binary scale consists of only two members: 1 and 0. On the other hand, the number of natural numbers is infinite.

Second, a scale is either dense or discrete.

(55) A relation R in A is dense (Partee et al. 1990:51)

if for every $<x, y> \in R$, $x \neq y$,

there exists a member $z \in R$, $x \neq z$ and $y \neq z$, such that $<x, z> \in R$ and $<z, y> \in R$.

On the dense scale, it is impossible to define an immediate predecessor (Partee *et al*. 1990:51). For example, the relation 'is greater than' is dense on the real numbers, but not on the natural numbers. On the scale of real numbers, 4 is greater than 2. There is 3 which is greater than 2 and which 4 is greater than. Then, 2 is not

the immediate predecessor of 4 in the relation 'is greater than.' Instead, 3 is the immediate predecessor of 4 because there are no natural numbers which are greater than 3 and which 4 is greater than. For each member on the discrete scale, on the other hand, which one is the immediate predecessor is clear. On the scale of natural numbers, 4 is greater than 2. There is 3 which is greater than 2 and which 4 is greater than. Then, 2 is not the immediate predecessor of 4 in the relation 'is greater than.' Instead, 3 is the immediate predecessor of 4 because there are no natural numbers which are greater than 3 and which 4 is greater than.

Third, scales are sorted with respect to presence of minimal and/or maximal elements. A scale is *open* when it lacks a minimal element, a maximal element, or both. Otherwise, a scale is *closed* when it has minimal and maximal elements. This distinction between open and closed scales in the domain of adjectives is identified through empirical evidence such as the acceptability of modification by proportional modifiers such as *completely*, *half* and *mostly* (Lehrer 1985, Cruse 1986, Hay 1998, Kennedy and McNally 1999, 2005, Paradis 2001). There are four possible combinations depending on the existence of minimal and/or maximal elements on the scale.

(56) A Typology of Scale Structures (Kennedy and McNally 2005:354)

(R: the ordering relation, Δ: the dimension for the scale)

a. $(D(0,1), R, \Delta)$ (TOTALLY) OPEN SCALE

b. $(D[0,1), R, \Delta)$ LOWER CLOSED SCALE

c. $(D(0,1], R, \Delta)$ UPPER CLOSED SCALE

d. $(D[0,1], R, \Delta)$ (TOTALLY) CLOSED SCALE

Kennedy and McNally (2005:355) provides an explanation on the types of scales

by making use of openness and closedness. If a scale has both a maximal element and a minimal element, then it is closed. If a scale has neither a maximal element nor a minimal element, then it is open. If a scale has only a maximal element but not a minimal one, then it is upper closed (and lower open). If a scale has only a minimal element but not a maximal element, then it is lower closed (and upper open).

These four scale patterns are identified based on adjectival polarity. Adjectival antonymy refers to positive and negative pairs which utilize the same set of degrees and the orderings along the same dimension but are the inverse of each other (Kennedy and McNally 2005:354). The distribution of maximal modifiers such as *100%*, *completely*, and *fully* is examined as diagnostics.

(57) (Kennedy and McNally 2005:355)

a. Open scale pattern

i. Her brother is completely ??tall/??short.

ii. The pond is 100% ??deep/??shallow.

iii. Max is fully ??eager/??uneager to help.

b. Lower closed scale pattern

i. The pipe is fully ??bent/straight.

ii. The room became 100% ??loud/quiet.

iii. That author is completely ??famous/unknown.

c. Upper closed scale pattern

i. We are fully certain/??uncertain about the results.

ii. This product is 100% pure/??impure.

iii. The treatment is completely safe/??dangerous.

d. Closed scale pattern

i. The room was 100% full/empty.

ii. The flower was fully open/closed.

iii. The figure was completely visible/invisible.

Fourth, a scale has the standard of comparison: absolute standard or relative standard. Absolute standard depends on the existence of a minimal or maximal element. Lower closed scale patterns have the absolute standard as its minimal element; upper closed scale patterns have the absolute standard as its maximal element. The standard of closed scale patterns is either the minimal or the maximal element. Then, an open scale has a relative standard, which is contextually determined.

2.3.3 Aspectual Classes

Through this thesis, I deal with predicates in terms of aspectual characteristics.

Besides four aspectual classes – states, activities, accomplishments, and achievements – proposed by Vendler (1957), other types of classes are introduced – semelfactives (Smith 1991) and degree-achievements (Dowty 1979).

(58) a. States: know, love, tall

b. Activities: run, walk, play, push a cart

c. Accomplishments: build a house, eat an apple, draw a circle

d. Achievements: notice, find, recognize, die, arrive

(59) a. Semelfactives: kick, knock, jump, skip, flap, wink (Rothstein 2008:182)

b. Degree-achievements: cool, widen, increase, decrease

(60) *for*-adverbials

a.	States:	She knew the name for ten minutes.
b.	Activities:	She ran for tem minutes.
c.	Accomplishments:	#She drew a circle for ten minutes.
d.	Achievements:	#She found the book for ten minutes.

(61) Time-frame adverbials

a.	States:	#She knew the name in ten minutes.
b.	Activities:	#She ran in ten minutes.
c.	Accomplishments:	She drew a circle in ten minutes.
d.	Achievements:	She found the book in ten minutes.

(62) *almost*

a.	States:	She almost knew the name.	'She almost began…'
b.	Activities:	She almost ran.	'She almost began…'
c.	Accomplishments:	She almost drew a circle.	'She almost began…'
			'She almost finished…'
d.	Achievements:	She almost found the book.	'She almost began…'

(63) progressive

a.	States:	*She is knowing the name.	
b.	Activities:	She is running.	'She has run'
c.	Accomplishments:	She is drawing a circle.	'She has not drawn a circle'
d.	Achievements:	*She is finding the book.	

Activities

Besides the minimal parts problem, Dowty (1977:50) doubts the homogeneous property of activities. However, Michaelis (2005:20,45) distinguishes activities into

heterogeneous activities (running) or *homogeneous activities* (holding a broom, standing in a corner, or sleeping). A homogeneous activity requires access to points of inception and termination, as well as several contiguous frames between those endpoints. We will deal with homogeneous activities in Chapter 3.

Accomplishments

Pustejovsky (1991) defines an accomplishment as a complex event, which has preparatory process and result state. It has a transition point. This type of event has a change from A to not A. The preparatory process of accomplishment is comparable to activity, so that accomplishments and activities sometimes show similar behaviors. The aspectual semantics of accomplishments and activities are influenced by the individuation of the direct object. *Draw the circle* is telic, but *draw circles* is atelic. *Eat apples* is atelic, but *eat an apple* is telic. They show variability in their telicity.

Also, both of them appear in the progressive form, but accomplishments induce the 'imperfective paradox', while activities do not. This 'imperfective paradox' means that when an accomplishment verb phrase is in the progressive form, it fails to entail the existence of a result-state but at the same time entails that the subject is engaging in some activity realizing that result-state. For example, in case *she is drawing a circle*, she has just drawn only a short line and the circle does not exist now; yet, it is circle-drawing activity (Dowty 1977:46).

Achievements

Achievement is a complex event as well, but does not include the preparatory

process, unlike accomplishment (Pustejovsky 1991, Nam 2007). This class also has a transition point. It is a change event from *P* to not *P*. Vendler (1957) assigns the feature of [+Punctuality] to the achievement class; however, van Voorst (1992:69) classifies perception verbs such as *see*, *hear*, and *feel* into non-punctual achievements, based on the examples in (64).

(64) a. Non-punctual achievements

We will certainly see you again for an hour tomorrow.

b. Punctual achievements

*We will surely notice you again for an hour tomorrow.

Degree-achievements

Degree-achievement verbs refer to either telic or atelic events depending on context. The sum of '3 degrees increase' and '3 degrees increase' is '6 degrees increase', not '3 degrees increase'; on the other hand, the sum of 'the temperature increases' and 'the temperature increases' results in 'the temperature increases' in cases where 'the temperature' indicates an identical value. The latter is cumulative and divisive in its part-whole structure: for an event, both the sum of events and a part of event have the same properties as the event. This yields an atelic interpretation. Whereas, the degree of change is contextually determined, which results in a telic interpretation (Piñón 2008).

Semelfactives

Semelfactives are single-stage events (Smith 1991). The examples are *kick*, *knock*, *jump*, *skip*, *flap(its wings)*, and *wink* (Rothstein 2008:182).

According to Rothstein (2008:182), semelfactives are similar to activities and accomplishments in that they occupy minimal intervals and are not instant. Semelfactives show the same behaviors as quantized accomplishments in that they induce the imperfective paradox (65) and occur with *in α time* (66), but unlike accomplishments, they do not denote events of change.

(65) (Rothstein 2008:182)

a. John was knocking hard when he saw me, so he turned it into a tap instead (and didn't knock hard).

b. Bill was kicking him when he saw me, so he stopped midway (and didn't kick him).

(66) (Rothstein 2008:182)

John jumped in three seconds.

'(In a context of a pole vault or, a slow motion film,) it takes three seconds for John to jump in one motion from departing to landing'

Semelfactives denote sets of atoms by means of the natural atomicity, not by telic atomicity (Rothstein 2008).

Even though the semelfactives sometimes act like activities in that they occur with atelic modifiers (67) and do not induce the imperfective paradox (67), semelfactives and activity predicates are two different things, as in (68).

(67) (Rothstein 2008:183)

a. John knocked on the door (repeatedly) for several minutes/half an hour.

b. John was knocking on the door when I arrived. (So he had knocked.)

(68) (Rothstein 2008:184)

a. Counting adverbials

(i) Dafna jumped/skipped once/twice. (single events or iterations)

(ii) Dafna ran once/twice. (only extended events)

b. *in* α time

(i) Dafna jumped in two minutes. (measuring the time of a single jump)

(ii) Dafna ran in two minutes. (measuring the time of the extended event)

c. *again and again*

(i) She jumped again and again

ok'She jumped for several minutes' / ok'She jumped at intervals'

(ii) He ran again and again.

#'He ran for several minutes' / ok'He ran at intervals'

d. Nominalisation

a. He gave a jump/a kick/ a wink. (single events)

b. He had a walk/a run/a swim. (extended events)

States

Bennett and Partee (1972) sort verb phrases into three classes: (i) stative verb phrases, (ii) subinterval verb phrases, and (iii) nonstative, nonsubinterval verb phrases. Stative verb phrases are "verb phrases which do not take the progressive form" (e.g. *be happy*, *love Mary*, and *believe that Mary walks*). Subinterval verb phrases "have the property that if they are the main verb phrase of a sentence which is true at some interval of time *I*, then the sentence is true at every subinterval of *I* including every moment of time in *I*" (e.g. *walk*, *breathe*, *walk in the park*, and *push a cart*). Nonstative, nonsubinterval verb phrases are "verb

phrases which are neither stative nor subinterval" (e.g. *die*, *walk to Rome*, *catch a fish*, and *build a house*).

It is true that the last class of verb phrases is nonstative, but the description that the verb phrases in this class take the progressive form is not appropriate. Verbs like *find* and *arrive* are neither stative nor subinterval, so they should belong to nonstative, nonsubinterval verb phrases in terms of Bennett and Partee's (1972) classification. However, these verbs cannot take the progressive form, as in **I am finding the book on the desk*.

In Korean, the progressive form (e.g. -*ko iss*-) is not a proper examination for states because some stative predicates are felicitous in combination with the progressive form -*ko iss*-, as in (72), (74), (76).

(69) **Dimensional states**:

khu- 'big/large', cak- 'small/little', kil- 'long', ccalp- 'short', mel- 'far', kakkap- 'near/close (to)', nelp- 'wide/broad', cop- 'narrow', manh- 'many/much', cek- 'a few/little', kwup- 'be bent', napcakha- 'flat', malu- 'dry', cec- 'wet', ppalkahta 'red'

(70) a. <u>nelp</u>-ko <u>phwul</u>-un pata
wide-and blue-ADN sea
'The vast blue sea'

b. pang-i <u>nelp</u>-{***ko** **iss**}-ta
room-NOM wide-CONJ exist-DECL
'The vast blue sea'

(71) **Existential states**:

issta 'exist', epsta 'non-exist/poor', ppacita 'be absent/be missing', salta 'alive'

(72) a. salam-tul-i sal-**a** **iss**-ta
person-PL-NOM live-CONJ exist-DECL
'People are alive'

b. salam-tul-i sal-**ko** **iss**-ta
person-PL-NOM live-CONJ exist-DECL
'People are living their lives'

(73) **Possessive states**:
kacita 'have/possess', soyuhata 'possess'

(74) a. Mina-ka chayk-ul kaci-**ko** **iss**-ta.
M.-NOM book-ACC possess-CONJ exist-DECL
'Mina has {a/the} book [Lit. Mina is having book]'

b. Mina-ka chayk-ul kaci-**{*e** **iss}**-ta.
M.-NOM book-ACC possess-CONJ exist-DECL
Intended: 'Mina is in possessing of book'

(75) **Locational/Positional states**:
wichihata 'be located', thonghata '(the doors) open (onto the road)'

(76) a. hakkyo-nun ceccok-ey wichiha-**ko** **iss**-ta.
school-TOP there-LOC locate-CONJ exist-DECL
'A school is located over there'

b. hakkyo-nun ceccok-ey wichiha-**e** **iss**-ta.
school-TOP there-LOC locate-CONJ exist-DECL
'A school is located over there'

Therefore, this thesis makes use of a dynamic expression *-nun cwungita* 'be in the course of -ing' to test compatibility with the progressive form.

(77) a. salam-tul-i sa-**nun** **cwung-i**-ta
person-PL-NOM live-ADN mid-COP-DECL
#'People are in the course of being alive'
'People are in residence'

b. *Mina-ka chayk-ul kaci-**nun** **cwung-i**-ta
M.-NOM book-ACC possess-ADN mid-COP-DECL
Intended: 'People are in the course of possessing the book'

(78) a. *hakkyo-nun ceccok-ey wichiha-**nun** **cwung-i**-ta.
school-TOP there-LOC locate-ADN mid-COP-DECL
Intended: 'A school is in the course of being located over there'

Furthermore, the examination expression *-nun cwungita* 'be in the course of -ing' enables the division of psychological events and states. The term *psych predicates* refer to adjectives or verbs that indicate the psychological experience of animate object such as emotion, perception, cognition (Nam 2007). van Voorst (1992:81) compares the class of 'psychological verbs' to four aspectual classes, and the class of 'psychological verbs' consists only of psychological events. In Korean, however, the distinction between events and states in the psychological predicate is not determined in terms of part of speech (e.g. verbs or adjectives).

(79) a. **Emotional events**:
culkita 'enjoy', kippehata 'be glad/rejoice', salanghata 'love', mwusewehata 'fear', cilwuhayhata 'be bored', kamsaha- 'appreciate', hwuhoyha-ta 'regret', komawehata 'appreciate'

b. **Emotional states**:
sulphuta 'sad', cilwuhata 'boring', komapta 'be thankful', hwuhoysulepta 'regretful'

(80) a. ku-nun sungli-lul kippeha-**nun** **cwung-i**-ta.
he-TOP victory-ACC rejoice-ADN mid-COP-DECL
'He is rejoicing over a victory'

b. *i iyaki-nun sulphu-{**n**/**nun**} **cwung-i**-ta.
this story-TOP sad-ADN mid-COP-DECL
Intended: 'This story is in the course of being sad'

(81) a. **Evaluating events**:
conkyenghata 'respect', concwunghata 'respect', yathpota 'look down on somebody/something'

b. **Evaluating states**:
conkyengsulepta 'respectful', chakhata 'good-hearted', hunhata 'commonplace', ttokkathta 'same', olhta 'right/proper', hankyelkathta 'unchanging/constant'

(82) a. pwumonim-kkey kamsaha-**nun** **cwung-i**-ta.
parents-DAT thank-ADN mid-COP-DECL
'[I] am expressing gratitude to one's parents'

b. *ney mal-un cengmal olh-{**un**/**nun**} **cwung-i**-ta.
your remark-TOP really be.right-ADN mid-COP-DECL
Intended: 'You are in the course of being right'

(83) a. **Perception events**:
pota 'see', tutta 'hear', maspota 'taste', mathta 'smell', salphita 'look'

b. **Perceptional states**:
aphuta 'painful', chwupta 'cold', talta 'sweet'

(84) a. cikum Mina-ka naymsay-lul math-**nun** **cwung-i**-ta.
now M.-NOM odor-ACC smell-ADN mid-COP-DECL
'Now, Mina is smelling the odor'

b. *Mina-ka aphu-{**n/nun**} **cwung-i**-ta.
M-NOM sick-ADN mid-COP-DECL
Intended: 'Mina is in the course of being sick'

(85) a. **Cognition events**:
sayngkakhata 'think', kwunglihata 'think (of)/ponder', kacenghata 'assume', paywuta 'learn'

b. **Cognitive states**:
alta 'know/recognize', mitta 'believe'

(86) a. Mina-ka pangpep-ul sayngkakha-**nun** **cwung-i**-ta.
M.-NOM method-ACC think-ADN mid-COP-DECL
'Mina is thinking of a method'

b. *ku salam-tul-i pimil-ul a-**nun** **cwung-i**-ta.
that person-PL-NOM secret-ACC know-ADN mid-COP-DECL
Intended: 'Those people are in the course of knowing the secret'

(87) a. **Desire events**:
palata 'hope', wenhata 'want', sowenhata 'wish/hope', kiwenhata 'pray', kitayhata 'long for'

b. **Desire states**:
huymangey chata 'hopeful', kitayey pwuphwulta 'be buoyant with expectations'

(88) a. Mina-ka hapkyek-ul pala-**nun** **cwung-i**-ta.
M.-NOM pass-ACC hope.to-ADN mid-COP-DECL
'Mina is hoping to pass the exam'

b. *Mina-nun senmwul-ul pat-ul sayngkak-ey
M.-TOP gift-ACC receive-ADN thought-INST
kitay-ey pwuphwu-**nun** **cwung-i**-ta.
expectation-INST swell-ADN mid-COP-DECL
Intended: 'Mina is in the course of being buoyant with expectations for a gift'

3 Pluractionality on Adverbs

There are many temporal expressions which can appear as a root of a reduplicative adverb.

(1) Reduplicative Adverbs in Korean

a. halwu-halwu ‘(from) day to day’, cacwu-cacwu ‘ever so often’, tumwun-tumwun ‘now and then/occasionally’, sai-sai ‘in spare moments’, yen-nyen ‘year {by/after} year’

b. na-nal-i ‘day {by/after} day’, ta-tal-i ‘month {by/after} month’, chel-chel-i ‘from season to season’, yen-nyen-i ‘year {by/after} year’, thum-thum-i, ccam-ccam-i ‘in spare moments’, kan-kan-i ‘sometimes/from time to time’, pen-pen-i ‘time after time/all the time’

Among various reduplicative adverbs in Korean, the pattern of N-N-*i* is usually considered to correspond to phrasal adverbs in other languages. There have been several versions of the semantics of pluractional adverbials proposed, particularly reduplicative adverbials like N(oun)-*by*-N(oun), as in (2).

(2) Phrasal adverbs

a. **N *by* N**

piece by piece, hour by hour (Beck and von Stechow 2007)

day by day (Jackendoff 2008)

inch by inch (Henderson 2012)

b. **N preposition N**

dog after dog, stone upon stone, time after time (Beck and von Stechow 2007)

time after time (Beck and von Stechow 2007)

day after day (Jackendoff 2008)

meter za metrom 'meter by meter' in Russian (Braginsky and Rothstein 2008)

c. **(*from*) N *to* N**

de temps en temps 'from time to time' in French (Doetjes 2007)

(from) day to day (Jackendoff 2008)

from room to room (Zwarts 2013)

d. **Numeral *by* Numeral**

one by one (Brasoveanu and Henderson 2009; Henderson 2012)

Among others, Henderson's (2012) proposal, extending Kennedy's (2012) scalar analysis, handles participant-based pluractionality and degree-based pluractionality involved in *piece by piece* and *inch by inch*, but not the temporal pluractionality induced by adverbials like *day by day*.

Meanwhile, the invisible operator analysis in Beck and von Stechow (2007) and Beck (2012) introduces two types of invisible pluractional operators into the structure and argues that the pattern of adverbials N-*by*-N and N-preposition-N determines the type of pluractional operator. These two operators will be introduced in detail in Section 3.3.2.

Reduplicative adverbs like N-N-*i* and phrasal adverbs like (preposition-)N-preposition-N are comparable in that both types use bare nouns as the root of reduplication. In this sense, N-N-*i* can be used to examine whether or not the previous accounts based on reduplicative patterns of phrasal adverbs could be applied to other levels like morphology in the same way.

In this chapter, I pay attention to the cases of *tatali* 'month by month', *nanali* 'day after day', and *halwuhalwu* '(from) day to day', which show the explicit distinctions in distribution and interpretation. As well-controlled data, these

reduplicative adverbs will afford a better understanding for an analysis of pluractionality.

3.1 Pluractional Phenomena of Temporal Adverbs *N-N(-i)*

Before defining the semantics of *nanali* as pluractionality, we begin by mentioning that *nanali* is not a quantifier. We consider two affixes *may*- and -*mata* 'every/each' in Korean as a quantifier and examine that reduplicative adverbs are not quantificational by showing their behavior is different from that of *may*- and -*mata*. Pluractionality observed from reduplication can be captured in comparison with the distributivity of affixation with *may*- or -*mata*.

In Korean, affixation with *may*- and -*mata* seems to have a similar reading to reduplication, in that there are some contexts where one of these two different types of word-formation might be replaced with the other. The affixes *may*- and -*mata* are observed to have a semantic effect as a distributive marker in Korean (Oh 2006). *May*- and -*mata* can be regarded as a sort of D-quantifier because they attach to a nominal (phrase) and force a distributive reading of the nominal.[5]

(3) a. may- 'every'

may-il 'every/each-day', may-cwu 'every/each-week', may-wuel 'every/each-month', may-tal 'every/each-month', may-nyen 'every/each-year', may-hay 'every/each-year', may-cho 'every/each-second', may-

[5] *May*- and -*mata* are sometimes used together as follows:

a. may-il-mata 'every/each-day-every/each', may-cwu-mata 'every/each-week-every/each', may-wuel-mata 'every/each-month-every/each', may-nyen-mata 'every/each-year-every/each', may-hay-mata 'every/each-year-every/each'

pwun ‘every/each-minute’, may sikan ‘every/each hour’

b. -mata ‘every’

nal-mata ‘day-every/each’, cwu-mata ‘week-every/each’, wuel-mata ‘month-every/each’, tal-mata ‘month-every/each’, hay-mata ‘year-every/each’, pwun-mata ‘minute-every/each’, sikan-mata ‘hour-every/each’

In this section, we will focus on four characteristics that distinguish *tatali*, *nanali* and *halwuhalwu* from *mayil* ‘every day’ and/or *maytal* ‘every month’.

3.1.1 Construing Covers

First, the pluractional type of the three reduplicative adverbs has a condition on the subparts which plural events consist of. In order to refer to the subparts of plural events, I use the term *covers*, which Schwarzschild (1996) defines as follows:

(4) (Schwarzschild 1996:69)

C covers *A* if:

1. *C* is a set of subsets of *A*
2. Every member of *A* belongs to some set in *C*
3. $\varnothing$ is not in *C*

The condition on covers is that they consist of a kind of path. The covers are connected.

(5) Connectedness (Partee *et al*. 1990:42,211):

a. A relation *R* in *A* is connected (or connex) if and only if for every two distinct elements *x* and *y* in *A*, $\langle x, y\rangle \in R$ or $\langle y, x\rangle \in R$ (or both).

b. A relation R is connected iff $\forall x \forall y\ (x \neq y \rightarrow (Rxy \vee Ryx))$

For example, the sentence in (6a) is not true in contexts where all the movements occur from the same origin to the same destination, as in Figure 1-(ii), where the movements do not overlap in their origins or destinations, as in Figure 1-(iii) and (iv), or where a cover of movement has more than one origin or destination at the same time, as in Figure 1-(vi). (6a) is true in the contexts in Figure 1-(i) and (v). On the other hand, (6b) is true in all of the contexts in Figure 1.

(6) a. Mina-ka ta-tal-i cali-lul olmky-ess-ta.
M.-NOM month-month-ADV seat-ACC move-PST-DECL
'Mina moved her seat month by month'

b. Mina-ka may-tal cali-lul olmky-ess-ta.
M.-NOM every-month seat-ACC move-PST-DECL
'Mina moved her seat every month'

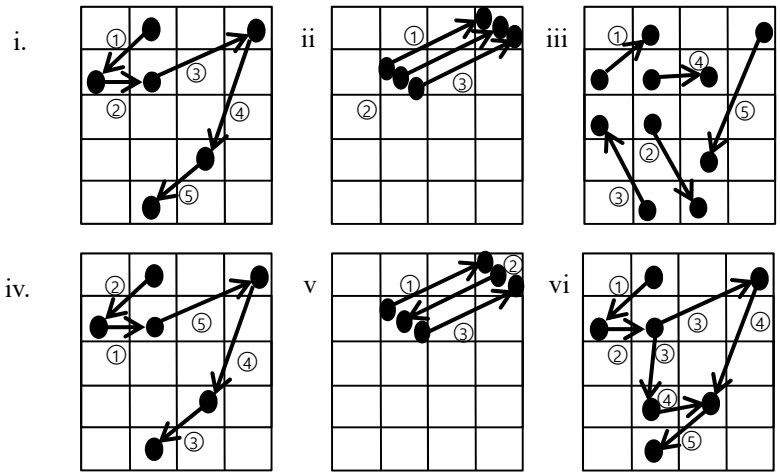

Figure 1. Examples of *Changes of Location*

Comparing *nanali* to *mayil*, the sentence in (7a) is not true in contexts where the change of color alternates between two colors, as in Figure 2-(ii), or in contexts where the ending state of each change is different from the starting state of its immediately following change, as in Figure 2-(iii). However, (7b) is true in all of the contexts in Figure 2.

(7) a. saykkkal-i na-nal-i pakkwuy-ess-ta.
color-NOM day-day-ADV be.changed-PST-DECL
'The color changed gradually day by day'

b. saykkkal-i may-il pakkwuy-ess-ta.
color-NOM every-day be.changed-PST-DECL
'The color changed every day'

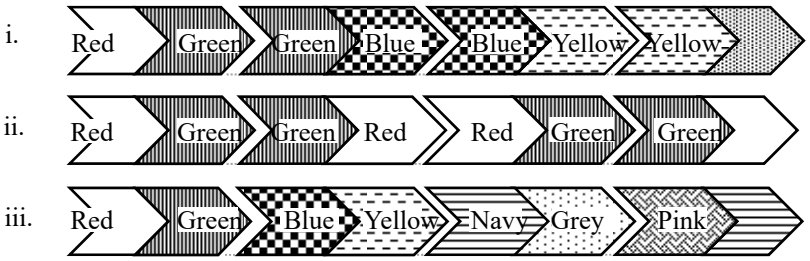

Figure 2. Examples of *Changes of Color*

The sentence containing *halwuhalwu* in (8) is not true in contexts where the result state of each change is restored before the immediately following change occurs, as in Figure 3-(ii), but (8b) is true in the same context. This difference is captured by means of the restitutive adverb *tolo*, which presupposes that there is some event followed by the one asserted by a predicate and that the asserted event is the restoration to the starting state of the presupposed predecessor event. In (8a′), *halwuhalwu* cannot modify the predicate which has already been modified by *tolo*;

in (8b′), *mayil* modifies the predicate modified by *tolo* although the sentence is not true in contexts like Figure 3-(i), but it is true in ones like Figure 3-(ii).

(8) a. halwu-halwu mwun thum-i pelecy-ess-ta.
1day-1day door gap-NOM widen-PST-DECL
'The door's gap widened from day to day'

b. may-il mwun thum-i pelecy-ess-ta.
every-day door gap-NOM widen-PST-DECL
'The door's gap widened every day' (no gap → gap: telic event)

a′. *halwu-halwu mwun thum-i **tolo** pelecy-ess-ta.
1day-1day door gap-NOM again(RESTITUTIVE) widen-PST-DECL
'The door's gap widened again from day to day'

b′. may-il mwun thum-i **tolo** pelecy-ess-ta.
every-day door gap-NOM again(RESTITUTIVE) widen-PST-DECL
'The door's gap widened again every day'

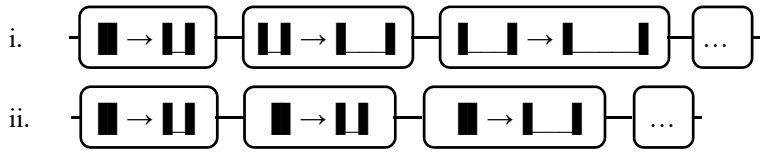

Figure 3. Examples of *Changes of State*

The covers of temporal intervals are determined by the unit noun of each adverb, such as *tal*, *nal*, and *halwu*, and those covers compose the whole temporal interval without any gap. This temporal interval is a *path*. A cover of an event starts at the ending state of its immediate predecessor, so that the whole event forms a single chain. Between the starting point and the ending point of the whole event, the covers of the event also compose a path.

3.1.2 Aspectual Selection

Tatali, *nanali*, and *halwuhalwu* have stronger restrictions on modifying a predicate than *maytal* 'every month' or *mayil* 'every day.' For example, *nanali* frequently appears with degree achievement predicates, but does not appear with either activities or statives. On the other hand, *mayil* is not likely to incline to a specific type of lexical aspects. It appears over the domain of *nanali*.

(9) a. **Degree achievement**

nalssi-ka {^{ok}**tatali**/^{ok}**nanali**/^{ok}**halwuhalwu**/^{ok}**mayil**} chwuw-ecy-ess-ta.

weather-NOM {MMi/DDi/1D1D/every.day} become.cold-PST-DECL

'The weather became colder month by month'

'The weather became colder day by day'

'The weather became colder day to day'

'The weather became colder every day'

b. **Activity**

Mina-ka {*tatali/*nanali/*halwuhalwu/^{ok}**mayil**} tally-ess-ta.

M.-NOM {MMi/DDi/1D1D/every.day} run-PST-DECL

Intended: 'Mina ran monthly'

Intended: 'Mina ran daily'

Intended: 'Mina ran daily'

'Mina ran every day'

c. **State**

Mina-ka {*tatali/*nanali/*halwuhalwu/^{ok}**mayil**} aph-ass-ta.

M.-NOM {MMi/DDi/1D1D/every.day} be.sick-PST-DECL

Intended: 'Mina was sick monthly'

Intended: 'Mina was sick daily'

Intended: ‘Mina was sick daily’

‘Mina was sick every day’

d. **Accomplishment**

Mina-ka {^{ok}**tatali**/*nanali/*halwuhalwu/^{ok}**mayil**}

M.-NOM {MMi/DDi/1D1D/every.day}

cip han chay-lul ci-ess-ta.

house one CL-ACC build-PST-DECL

‘Mina built one house per month, for several months’

Intended: ‘Mina built one house daily’

Intended: ‘Mina built one house daily’

‘Mina built one house every day’

e. **Achievement**

yelsoy-ka {^{ok}**tatali**/*nanali/*halwuhalwu/^{ok}**mayil**} epsecy-ess-ta.

key-NOM {MMi/DDi/1D1D/every.day} disappear-PST-DECL

‘(A/The) key disappeared month by month’

Intended: ‘(A/The) key disappeared daily’

Intended: ‘(A/The) key disappeared daily’

‘(A/The) key disappeared every day’

Meanwhile, the acceptability of *tatali* in (9d, e) shows that there are different types even among pluractional adverbs. The discord between these pluractional adverbs and certain classes of lexical aspects is due to the basic structure of given verbs not satisfying the conditions each pluractional adverb requires. Focusing on this, this study will present the semantic and syntactic differences among these adverbs in the following sections.

Reduplicative adverbs *tatali* ‘month by month,’ *nanali* ‘day by day’ and

halwuhalwu '(from) day to day' in Korean have a similarity in that they show an inclination to appear with degree-achievement predicates, but avoid directly modifying activity predicates without other expressions. By looking deeper, however, this study observes the semantic and syntactic differences among these adverbs despite the similarity in morphological structure between *tatali* and *nanali* by means of reduplication plus affixation (N.N-*i*), and the co-referent '(a) day' of reduplicated unit nouns (*nal* and *halwu*) of *nanali* and *halwuhalwu*. This study discusses a semantic and syntactic conditions on *tatali*, *nanali*, *halwuhalwu* as ***pluractional adverbs***, and proposes that each of them requires the different structure from the others.

3.1.3 *Almost* Tests

These three adverbs derive a different type of interpretation from adverbs with *may-* when it is modified by *keuy* 'almost.' In recent studies such as Penka (2006), *almost* is observed to modify not only universal quantifier but also other expressions such as *half* and measure phrases associated with a dense scale. The possibility modification with *almost* cannot be used anymore in order to determine whether the modified expression refers to universality. Despite this, we can still discover the difference between *mayil* and *nanali* through the modification of *keuy*. Suppose that 100 days are given in the context and *mayil* denotes those 100 days. Then, *keuy mayil* denotes less than 100 days, as *keuy 100 days* does. The semantic effect of *keuy*, approximating and denying the exact meaning, targets only the quantity of days (i.e. **99** days, not **100** days), not the unit of day itself (i.e. 100 **weeks**, not 100 **days**). On the other hand, it is unnatural to modify *nanali* with *keuy*.

Although *keuy nanali* is observed in some cases, in those cases *nanali* derives an interpretation related to manner/quality rather than quantity. The approximation of *keuy* is the expression *nanali* itself; in this case, the approximated and denied target could be the domain of *nanali*.

(10) a. onto-ka **keuy** may-il oll-ass-ta.
temperature-NOM almost every-day increase-PST-DECL
'The temperature increased almost every day'

b. ??onto-ka **keuy** na-nal-i oll-ass-ta.
temperature-NOM almost day-day-ADV increase-PST-DECL
'The temperature increased almost day by day'

3.1.4 Biased Scope Interactions with Other Operators

These three adverbs and adverbs with *may-* differ from each other in scope of interaction with other operators. For example, the universal quantifier *motun* 'every' scopes over *mayil*, and vice versa. Suppose that someone in a hotel is in charge of three rooms a day. (11a) is true in such a context that the temperature rises in all of the rooms A, B, and C on Day 1, in all of the rooms D, E and F on Day 2, and in all of the rooms C, D and E on Day 3 – *mayil* scopes over *motun*. On the other hand, suppose that someone in a hotel is in charge of only one room for three days and he works for twelve days. (11a) is true in such a context that the temperature rises in the room A on all of Day 1, 2, and 3, in the room B on Day 4, 5, and 6, and in the room C on all of Day 7, 8, and 9 – *motun* scopes over *mayil*. In constrast, *nanali* cannot scope over *motun* while *motun* scopes over *nanali*.

(11) a. **motun** pang-uy onto-ka **may-il** nophacy-ess-ta.
every room-GEN temperature-NOM every-day get.higher-PST-DECL
i. [*mayil* 'every day' > *motun pang* 'every room']
'For each day, the temperature of every room increased'
ii. [*mayil* 'every day' < *motun pang* 'every room']
'For each room, the temperature increased every day'

b. **motun** pang-uy onto-ka **na-nal-i** nophacy-ess-ta.
every room-GEN temperature-NOM day-day-ADV get.higher-PST-DECL
i. * [*nanali* 'day after day' > *motun pang* 'every room']
#'For each of many days, the temperature of every room increased'
ii. [*nanali* 'day after day' < *motun pang* 'every room']
'For each room, the temperature increased day by day'

Likewise, a sentence with negation and *mayil* has a scope ambiguity, but in the case with *nanali* only a narrow scope reading is available. Also, aspects have only the reading that it scopes over *nanali*, so that there is no scope ambiguity.

(12) a. i hoysa-uy cwuka-ka **may-il** olu-**ci anh**-ass-ta.
this company-GEN stock.price-NOM every-day increase-CI NEG-PST-DECL
(i) 'Every day, the stock price of this company did not increase'
(ii) 'It was not the case that the stock price of this company increased every day'

b. i hoysa-uy cwuka-ka
this company-GEN stock.price-NOM
may-il olu-**ta(ka) mal**-ass-ta.
every-day increase-CONJ TERM-PST-DECL
(i) 'Every day, the stock price of this company stopped increasing'

(ii) 'Increasing of the stock price of this company every day stopped'

c. i hoysa-uy cwuka-ka
this company-GEN stock.price-NOM
may-il olu-**l swu iss**-ess-ta.
every-day increase-ADN method POSB-PST-DECL

(i) 'Every day, the stock price of this company could increase'

(ii) 'It was possible that the stock price of this company increased every day'

(13) a. i hoysa-uy cwuka-ka
this company-GEN stock.price-NOM
na-nal-i olu-**ci anh**-ass-ta.
day-day-ADV increase-CI NEG-PST-DECL

(i) #'Day by day, the stock price of this company did not increase'

(ii) 'It was not the case that the stock price of this company increased day by day'

b. i hoysa-uy cwuka-ka
this company-GEN stock.price-NOM
na-nal-i olu-**ta mal**-ass-ta.
day-day-ADV increase-CONJ TERM-PST-DECL

(i) #'Day by day, the stock price of this company stopped increasing'

(ii) 'Increasing the stock price of this company day after day stopped'

c. i hoysa-uy cwuka-ka
this company-GEN stock.price-NOM
na-nal-i olu-**l swu iss**-ess-ta.
day-day-adv increase-ADN method POSB-PST-DECL

(i) #'Day by day, the stock price of this company could increase'

(ii) 'It was possible that the stock price of this company increased day by day'

3.2 Three Types of Semantic Conditions of Pluractional Adverbs

As shown in Section 2.2, *tatali*, *nanali*, and *halwuhalwu* show differences in which classes of predicates they can modify. These differences can be explained through the conditions which predicates should satisfy to be modified by each of these adverbs. We introduce three conditions: BOUNDEDNESS, SCALAR CHANGE, and DIVISIVE-PATH.

3.2.1 The BOUNDEDNESS Condition of *tatali* 'month by month'

The semantic condition of *tatali* is that a modified predicate should refer to a bounded event. For example, the following environments are not shared with *nanali* or *halwuhalwu*: (i) accomplishment verbs, (ii) activities with measure phrases, and (iii) achievement verbs.

First, when *tatali* is accompanied by an accomplishment verb, the covering events derive a telic reading. In (14a), a building event as cover should culminate in each month, and then another building event starts and culminates in the next month. This culmination is attributed to *tatali*, which is based on the fact that the telicity of covers does not depend on the existence of quantizing markers like classifier phrases. Under the modification of *tatali*, an incremental theme of accomplishment is considered to be bounded. Therefore, the interpretation of the sentence results in repeating a culmination and multiplying the quantity of incremental theme.

(14) a. **Accomplishment**

Mina-ka	ta-tal-i	cip(han chay-l)ul	ci-ess-ta.
M.-NOM	month-month-ADV	house(one CL)-ACC	build-PST-DECL

'Mina built a house month by month'

b. **Accomplishment**

Mina-ka	ta-tal-i	chayk(han kwen)-ul	ss-ess-ta.
M.-NOM	month-month-ADV	book(one CL)-ACC	write-PST-DECL

'Mina wrote a book month by month'

Second, the discord with a certain lexical aspect, e.g. activity, is solved by adding other expressions to the sentence, but which kind of expression is applicable depends on the condition of the adverb. In (15), for example, the event denoted by *tallita* 'run' becomes bounded by adding a measure phrase.

(15) **Activity with MP**

Mina-ka	ta-tal-i	**<u>sip khillomithe</u>**-lul	tally-ess-ta.
M.-NOM	month-month-ADV	10 km-ACC	run-PST-DECL

'Mina ran 10km per month, for several months
(lit. Mina ran 10km month by month)'

This type of event is identified as a bounded but atelic event in that the event has an end point but not a change of state (Egg 1995). Telicity entails boundedness, but not vice versa. While accomplichments and activities with a measure phrase differ in their telicity, they belong to a bounded event. The condition of *tatali* is confirmed as boundedness, not as telicity.

Our suggestion is that the selection of *tatali* does not depend only on the verb itself. Comparing (15) to (9b), activity verb *tallita* 'run' with *tatali* is

ungrammatical when there is no measure phrase. A measure phrase turns activities into the environment that *tatali* requires. As the common property to describe throughout the predicates in (14) and (15), I use the term boundedness, rather than telicity. While some studies use boundedness without differentiating it from telicity, Egg (1995) distinguishes boundedness and telicity as follows:

(16) (Egg 1995:319,326)

a. Boundedness: A bounded event has an end point.

$\forall P[\mathbf{BP}(P) \leftrightarrow \forall x \forall y(P(x) \wedge y \subset x \rightarrow \neg P(y))]$

b. Telicity: Telic predicates introduce a change of state.

$\forall P[\mathbf{TEL}(P) \leftrightarrow \exists P' \forall t \Box(P(t) \rightarrow$

$\mathrm{ATOM}(t, \lambda t \exists t' \exists t''(\neg P'(t') \wedge P'(t'') \wedge t'At \wedge tAt'') \wedge C(t'', P', P)))]$

According to these definitions, telicity entails boundedness, but not vice versa. He pays attention to atelic but bounded events (e.g. to run a mile, to play a sonata, to take for a while). By introducing Egg's (1995) definitions, 'running 10km' in (15) can be classified into the same domain as (14) as a bounded cover event, although it is an atelic event. In fact, Egg (1995) says that bounded predicates are neither cumulative nor divisive; however, his definition on boundedness is only composed of non-divisivity, as in (16a). A description of non-cumulativity is missing.[6] If a predicate is cumulative or divisive or both, then it is unbounded. Then, non-

[6] Likewise, Champollion's (2010:19) definition on quantized reference consists of only non-divisivity:

$\mathbf{QUA}(P) =_{def} \forall x[P(x) \rightarrow \forall y[y<x \rightarrow \neg P(y)]]$

A predicate P is quantized iff whenever it holds of something, it does not hold of any its proper parts.

divisivity is not enough to catch the unique class of bounded predicates.

(17) (Egg 1995:324)

a. Divisivity

$\forall P[\mathbf{DIV}(P) \leftrightarrow \forall x \forall y((P(x) \wedge y \subseteq x) \rightarrow P(y))]$

b. Cumulativity

$\forall P[\mathbf{CUM}(P) \leftrightarrow \forall x \forall y(P(x) \wedge P(y) \rightarrow P(x \cup y))]$

We have just seen an example of a non-divisive but cumulative predicate: running activity. One way is that to exclude unbounded predicates, non-cumulativity is introduced in the definition of boundedness.

(18) [Condition I] *Tatali* modifies a BOUNDED event.

P is BOUNDED iff

$\forall x \forall y[[P(x) \wedge P(y)] \rightarrow \neg P(x \vee y)] \wedge \forall x \forall y[[P(x) \wedge y < x] \rightarrow \neg P(y)]$

The other way is to find a distinctive property rather than cumulativity: S-cumulativity (Rothstein 2004). S-cumulativity is suggested by Rothstein (2004) as the formal property which captures the distinction between atelic and telic predicates in the verbal domain; but this user's guide needs a little modification. This property makes a division between unbounded and bounded predicates, rather than atelic and telic predicates.

(19) Rothstein's (2008:182) *S-cumulativity* (for singular cumulativity)

$\exists e \exists e'[X(e) \wedge X(e') \wedge \neg\, e \sqsubseteq e' \wedge \forall e \forall e'[X(e) \wedge X(e') \wedge \mathbf{R(e,e')} \rightarrow X({}^{S}(e \sqcup e'))]]$

"A predicate X is S-cumulative if any two distinct instances of X related by the 'R' relation can be summed, and the sum formed into a singular entity which is itself in the denotation of X."

(Here, R is a temporal adjacency relation.)

The set of unbounded events and states are closed under the operation of S-cumulativity; on the other hand, bounded events denote sets which are not closed under S-cumulativity.

Therefore, the semantic domain of *tatali* is defined as follows.

(20) [Condition I] *Tatali* modifies a BOUNDED event.

P is BOUNDED iff

$\forall e \forall e'[[P(e) \wedge e' < e] \rightarrow \neg P(e')]$

$\wedge\ \exists e \exists e'[P(e) \wedge P(e') \wedge \neg\ e \sqsubseteq e' \wedge \forall e \forall e'[P(e) \wedge P(e') \wedge \mathbf{R(e,e')} \rightarrow P({}^{S}(e \sqcup e'))]]$

Third, as shown above in (9e), *tatali* can modify achievement verbs, which satisfies the BOUNDEDNESS condition as a telic verb. What is important here is the type of nominals which achievements have as an argument. *Ku capci* 'that/the magazine' in (21a) is not a definite singular nominal with a demonstrative, but a *kind*-referring one. There are non-identical issues which cover this magazine. Each of them is mapped onto each cover of the issuing event. Likewise, *panci* 'ring' in (21b) denotes non-identical rings. In (21c), *tochakhata* 'arrive' can be modified by *tatali* only when the argument is plural. Here, the cover of the argument corresponds to an individual atom which composes a kind, as in (21a, b) or a subpart of a plural, as in (21c). Achievement verbs satisfy the condition by means of bounded covers of argument.

(21) a. **Achievement**

ku capci-ka ta-tal-i palkantoy-ess-ta.

that magazine-NOM month-month-ADV be.issued-PST-DECL

'The magazine was issued monthly'

b. **Achievement**

Mina-ka ta-tal-i panci-lul pakkwu-ess-ta.

M.-NOM month-month-ADV ring-ACC change-PST-DECL

'Mina changed her ring month by month'

c. **Achievement**

{Sonnimtul-i/?Mina-ka} ta-tal-i konghang-ey tochakhay-ss-ta.

{Guests-NOM/M.-NOM} month-month-ADV airport-LOC arrive-PST-DECL

'{Guests/?Mina} arrived at the airport month by month'

The sentences in (14)-(15) and (21) yield a "regularly" repetitive reading.

3.2.2 The SCALAR CHANGE Condition of *nanali* 'day after day'

Nanali only modifies scalar change predicates. While a measure phrase is added to *tallita* 'run' in order to make the event bounded, adding a measure phrase does not work on *nanali*. Instead, scalar expressions enable *nanali* to appear with various types of events: activities (*tallita* 'run' in (22a)), states (*alhta* 'be.ill' in (22b)), accomplishment (*cipul cista* 'build a house' in (22c)) and achievements (*tochakhata* 'arrived' in (22d)). Scalar adverbs in (22) rescue the acceptability of *nanali* in the environment where *nanali* is not usually accepted.

(22) a. **Activity with a Scalar Phrase**

Mina-ka na-nal-i (te) **ppall-i** tally-ess-ta.

M.-NOM day-day-ADV more fast-ADV run-PST-DECL

'Mina ran fast**er** day after day'

b. **State with a Scalar Phrase**

Mina-ka na-nal-i (te) **simha-key** alh-ass-ta.

M.-NOM day-day-ADV more serious-ADV be.ill-PST-DECL

'Mina got **more** seriously day after day'

c. **Accomplishment with a Scalar Phrase**

Mina-ka na-nal-i (te) **thunthunha-key** cip-ul ci-ess-ta.

M.-NOM day-day-ADV more solid-ADV house-ACC build-PST-DECL

'Mina built a house **more** solidly day after day'

d. **Achievement with a Scalar Phrase**

Mina-ka na-nal-i (te) **ilccik** tochakha-yss-ta.

M.-NOM day-day-ADV more early arrive-PST-DECL

'Mina arrived earli**er** day after day'

One remarkable thing is that the examples with *nanali* in (22) only have the reading where the scalar adverbs act as a comparative. *Nanali* forces the sentence to be interpreted as a gradual change whether or not the comparative marker *te* 'more' is present. On the other hand, neither *tatali* nor *halwuhalwu* can replace *nanali* in (22) if there is no explicit comparative marker *te*. When the comparative marker *te* is explicitly added to a scalar expression in (23), both *tatali* and *halwuhalwu* are grammatical and derive the reading with graducal change as *nanali* does. Without *te*, however, the former is ungrammatical in (22a-b), and the latter in (22a-d). Here, *tatali* is accepted in (22c-d) without *te* because the modified

predicates (*thunthunhakey*) *cipul cista* 'to build a house (solidly)' and (*ilccik*) *tochakhata* 'to arrive (early)' are bounded events as mentioned in the previous section.

(23) a. **Accomplishment with a Scalar Phase**

Mina-ka	ta-tal-i	**thunthunha-key**	cip-ul	ci-ess-ta.
M.-NOM	month-month-ADV	solid- ADV	house-ACC	build-PST-DECL

'Mina built a house solidly month by month'

b. **Achievement with a Scalar Phase**

Mina-ka	ta-tal-i	**ilccik**	tochakhay-ss-ta.
M.-NOM	month-month-ADV	early	arrive-PST-DECL

'Mina arrived early month by month'

The difference of *tatali* from *nanali* is identified by the fact that the sentences in (23) do not yield a gradual change but a regularly repetitive reading. Also, *nanali* may force a non-scalar predicate to turn into scalar by aspect coercion. As shown in (7a) ((repeated in (24)), even though *pakkwuyta* 'change' is a non-scalar predicate, the sentence with *nanali* is true only in the context where members of colors are connected in an order and members that have appeared before do not appear again.

(24)

saykkkal-i	na-nal-i	**pakkwuy**-ess-ta.	= (7a)
color-NOM	day-day-ADV	change-PST-DECL	

'The color changed day by day'

This context corresponds to a strictly linear-ordered set, i.e. scale, in which members are irreflexive, asymmetric, and connected.

(25) (Partee *et al*. 1990:209,211)

R is a strict linear (or total) order on a set S iff:

Transitivity: $\forall x \forall y \forall z\ ((Rxy\ \&\ Ryz) \rightarrow Rxz)$

Irreflexivity: $\forall x\ (\sim Rxx)$

Asymmetry: $\forall x \forall y\ (Rxy \rightarrow \sim Ryx)$

Connectedness: $\forall x \forall y\ (x \neq y \rightarrow (Rxy \vee Ryx))$

Nanali modifies an event as a strictly linear-ordered set.

(26) [Condition II] *Nanali* modifies a SCALAR CHANGE event.

P is a SCALAR CHANGE iff P defines an incremental relation R_p; R_p is an order-preserving map[7] from a poset of events *E* to a strict linear-ordered set *S*.

Moreover, scalar changes as a covering event of *nanali* should be indefinite, which is identified by the fact that *nanali* is blocked where the environment has lost the property of indefinite scalar change. A definite and specific scalar change can co-occur with *nanali* only when it indicates the total amount of the whole change, not one of each cover of change.

In (27), the only possible reading is that Mina raised the greenhouse's

[7] Partee et al. (1990) defines order-preserving map as follows:

"Isomorphism of lattices as posets is defined by requiring the bijection to be order-preserving. **If P1 = ⟨P1, ≤⟩ and P2 = ⟨P2, ≤⟩ are two posets and F: P1 → P2,** F is called **an *order-preserving map* if F(a) ≤ F(b) holds in P2 whenever a ≤ b holds in P1.** Sometimes an order-preserving map is called a monotone or an isotone mapping.

Theorem 11.3 Two posets which are lattices L1 = ⟨L1, ≤⟩ and L2 = ⟨L2, ≤⟩ are (order-theoretically) isomorphic iff there is a bijection F: L1 → L2 such that both F and F^{-1} are order-preserving."

temperature day by day; the whole change of temperature was from 30°C to 60°C, as in (28). This is because the designated source and goal refer to a definite (durative) scalar change.

(27) Mina-ka onsil onto-lul na-nal-i
M.-NOM greenhouse temperature-ACC day-day-ADV
sepssi 30-to-eyse 60-to-lo olly-ess-ta.
Celsius 30-degree-from 60.degree-to increase-PST-DECL
i. #'Each day, Mina increased the temperature of greenhouse from 30° to 60°'
ii. ok 'Mina increased the temperature of greenhouse day by day, the total amount of the whole change is 30 degrees, and an increasing event from 30° to 60° occurs once'

(28) Mina-ka onsil onto-lul **yelhul-kan** na-nal-i
M.-NOM greenhouse temperature-ACC ten.days-during day-day-ADV
sepssi 30-to-eyse 60-to-lo **cokum-ssik** olly-ess-ta.
Celsius 30-degree-from 60-degree-to little-DSH increase-PST-DECL
'Mina increased the temperature of greenhouse little by little day by day, the total amount of the whole change is 30 degrees, and an increasing event from 30° to 60° occurs once'

Beck (2012) points out that with an overt *than*-constituent, it is impossible to get the pluractional comparison interpretation. Likewise, *-pota* 'than' seems to keep *nanali* from appearing in the sentence regardless of the existence of rescuing expressions because the *single-occurrence* event derived from *-pota* is unsuitable for pluractionality.

(29) (Beck 2012:80, 81)

a. # Otto ran faster and faster than John.

b. # This company sells more and more expensive insurance than before.

(30) a. Mina-nun na-nal-i panci-lul
M.-TOP day-day-ADV ring-ACC
(*Nami kes-pota) te pissa-n kes-ulo pakkwu-ess-ta.
(N. thing-than) more expensive-ADN thing-DIR replace-PST-DECL
'Day by day Mina changed the ring for a more expensive one (*than Nami's)'

b. Mina-nun na-nal-i **(*Nami-pota)** te ppall-i tally-ess-ta.
M.-TOP day-day-ADV N.-than more fast-ADV run-PST-DECL
'Mary ran faster (than Nami) day by day'

However, there is a case where *nanali* appears with *-pota*.

(31) koka-uy sangcangcwusik cwuka-ka
high.price-GEN listed.stocks stock.price-NOM
ceka-uy **sangcangcwusik-pota** na-nal-i ***(te)** **cungkaha**-nta.
low.price-GEN listed.stocks-than day-day-ADV more increase-DECL
'The values of high-priced stocks increase more than the ones of low-priced stocks day by day'
≈ 'The values of high-priced stocks increase day by day, and the values of low-priced stocks also increase day by day. The differential between the values of high-priced stocks and low-priced stocks becomes larger day by day'

The important thing is that, in addition to the value of high-priced stocks, the value of low-priced stocks, whichi is the target modified by *-pota*, also increases under *te cungkahata*. The gradient of high-priced stock is greater than the gradient

of low-priced stock. In this comparative construction, *nanali* targets a scalar change of differentials between the values of high-priced stock and the values of low-priced stock. Here, *-pota* is not an absolute blocker against *nanali*.

3.2.3 The DIVISIVE-PATH Condition of *halwuhalwu* '(from) day to day'

The domain of *halwuhalwu* is restricted to certain types of activity predicates as well as degree achievement predicates. Homogeneous activities *kitalita* 'wait (for)', *mekko salta* 'live on eating' and *pethita* 'endure' in (32) can be modified by *halwuhalwu*, but not by either *tatali* or *nanali*. Unlike the heterogeneous activity *run* in (33), this type of activity shows a particular durative reading, a so-called *prolonged* interpretation, such as 'to endure', 'to sustain life', or 'to live on', where the event ends and cannot restart once it stops.

(32) **Homogeneous Activity**

a. Mina-ka halwu-halwu **kitaly**-ess-ta.
M.-NOM 1day-1day wait-PST-DECL
'Mina waited (from) day to day'

b. Mina-ka halwu-halwu **sal**-ass-ta.
M.-NOM 1day-1day live-PST-DECL
'Mina lived (from) day to day'

c. Mina-ka halwu-halwu **kyentye**-ss-ta.
M.-NOM 1day-1day endure-PST-DECL
'Mina took it (from) day to day'

(33) **Heterogeneous Activity**

*Mina-ka halwu-halwu **tally**-ess-ta.

M.-NOM 1day-1day run-PST-DECL

'Mina ran (from) day to day'

Meanwhile, *halwuhalwu* cannot modify an event with a measure phrase, even with *wait*-type activities as in (34b) and degree-achievements as in (34c).

(34) a. **Canonical Activity with a Measure Phrase**

Mina-ka halwu-halwu ***(*sip khillomithe-ssik)** tally-ess-ta.

M.-NOM 1day-1day 10 km-DSH run-PST-DECL

Intended: 'Mina ran (10km per day) from day to day'

b. **Unceasing Activity with a Measure Phrase**

Mina-ka halwu-halwu **(*sam-pwun-ssik)** kitaly-ess-ta.

M.-NOM 1day-1day 3-minute-DSH wait-PST-DECL

'Mina waited (*for 3 minutes per day) from day to day'

c. **Degree-achievement with a Measure Phrase**

kion-i halwu-halwu **(*sam-to-ssik)** oll-ass-ta.

temperature-NOM 1day-1day 3-degree-DSH increase-PST-DECL

'The temperature increased (*by 3 degrees) from day to day'

As shown above, the domain of *halwuhalwu* is restricted to *wait*-type homogeneous activities and applies to neither heterogeneous activities (*run*-type) nor events with a measure phrase as follows:

(35) a. halwu-halwu {kitalita / kyentita / pethita / mekko salta}

1day-1day {wait (for) / take.it / endure / make a living}

b. *halwu-halwu tallita

1day-1day run

c. *halwu-halwu {3pwun-ssik kitalita / 3kilomite-ssik talita / 3to-ssik oluta}

1day-1day {wait 3 min. at a time / run 3km at a time / increase by 3 degrees}

Let us describe the predicates in (35) by means of cumulativity and divisivity in (36): (i) unceasing events in (35a) are cumulative and divisive, (ii) intermittent activities in (35b) are cumulative but non-divisive, and (iii) quantized events in (35c) are bounded, i.e. non-S-cumulative and non-divisive. The domain of *halwuhalwu* is restricted to predicates which are homogeneous, i.e. cumulative and divisive.[8,9] But, importantly, between cumulativity and divisivity, the latter is a crucial condition to distinguish *halwuhalwu* from other pluractional adverbials.

(36) a. Divisivity (Egg 1995:324)

$\forall P[\mathbf{DIV}(P) \leftrightarrow \forall x \forall y((P(x) \wedge y \subseteq x) \rightarrow P(y))]$

b. Cumulativity (Egg 1995:324)

$\forall P[\mathbf{CUM}(P) \leftrightarrow \forall x \forall y(P(x) \wedge P(y) \rightarrow P(x \cup y))]$

---

[8] a. Scheiner (2003): A predicate is divisive if its extension is closed under **partitioning** of entities.

b. Csirmaz (2007): A predicate P is divisible iff whenever P(x) for an argument x, then for all $y \subseteq x$, P(y).

c. Champollion (2010): $\mathbf{DIV}(P) =_{def} \forall x[P(x) \rightarrow \forall y[y<x \rightarrow P(y)]]$

A predicate P is divisive iff whenever it holds of something, it also holds of each of its proper parts.

[9] According to Egg (1995), some unbounded predicates are divisive and non-cumulative (like *to drink few bottles of beer*), non-divisive and cumulative (*to drink much beer*), or, worse still, neither cumulative nor divisive (*to work from two to five hours*).

(37) [Condition III] *halwuhalwu* modifies a DIVISIVE event.

P is DIVISIVE iff $\forall x \forall y[[P(x) \wedge y \leq x] \rightarrow P(y)]$

Moreover, *halwuhalwu* is identified to modify the predicates which become cumulative and divisive by the construction -*man ha*- 'do only something'.

(38) Mina-ka halwu-halwu talliki-**man ha**-yss-ta.
M.-NOM 1day-1day running-only do-PST-DECL
'Mina did only running day to day'

The construction -*man ha*- acts as a divisivizer. In (38), the construction -*man ha*- converts predicates into the ones *halwuhalwu* is able to modify. The assertion of focus marker *only* is assumed as a negation of alternatives of proposition modified by *only* (Horn 1996). The construction [*A-MAN B*] with the focus marker -*man* presupposes [*A B*] and asserts the negation of alternatives. Likewise, the lexical aspect of presupposition of [*talliki-MAN hata*] 'do only running' is an activity, as in [*talliki-lul hata*] 'do running'; the assertion part is identified as the negation of other types of events, i.e. [*talliki ioy-uy talun kes-ul haci anhta*] 'do nothing other than running.' The negation yields divisible predicates (Moltmann 1991, Zucchi 1991, Csirmaz 2008) rather than stative predicates (Bennett and Partee 1972, Dowty 1979, Verkuyl 1993, de Swart and Molendijk 1999 and others).

If we follow approaches assuming the negation as a stativizer, we might argue that it is due to the stativity that predicates modified by -*man* satisfy the condition of *halwuhalwu*. However, this account is refused by the fact that *halwuhalwu* cannot modify inherent stative prediates. Here, Csirmaz (2008) argues that negation is not an aspectual operator (i.e. stativizer), and that it does not affect the

properties of the event description and yields the divisive (i.e. *subinterval* in Csirmaz's terms) property for the reference time. Also, she accounts for *only* directly by means of Strawson's subinterval property, without a negated assertion. Regardless of whether *only* requires a negated assertion or not, an explanation for *only* converges into divisivity (or at least Strawson's subinterval property), which is enough to confirm the condition of *halwuhalwu*.

In Korean, neither a negation nor the focus marker -*man* can appear in the clause -*ki ceney* 'before ~' as in (39) (Nam 1997:10). In the clause -*ki ceney*, the construction -*man ha*- acts in the same way as negation and -*man* do.

(39) (Nam 1997:10)

a. *John-i **an** o-ki cen-ey Mary-ka ttena-ass-ta.
J.-NOM not come-NML before-LOC M.-NOM leave-PST-DECL
Intended: 'Mary left, before John didn't come'

b. *John-**man** o-ki cen-ey Mary-ka ttena-ass-ta.
J.-only come-NML before-LOC M.-NOM leave-PST-DECL
Intended: 'Mary left, before only John came'

(40) a. Mina-ka talli-ki-**man** ha-ki cen-ey*(nun)
M.-NOM run-NML-only do-NML before-LOC*(-TOP)
sengkyek-i kwaynchanh-ass-ta.
temper-NOM be.okay-PST-DECL
'The temper had been better before the period when she did only running'

b. ??Mina-ka talli-ki-**man** ha-ki cen-ey pi-ka nayly-ess-ta.
M.-NOM run-NML-only do-NML before-LOC rain-NOM fall-PST-DECL
'It had rained before she did only running'

3.2.4 The Intersection of Three Conditions: Degree-achievements and the Comparatives

As shown above, *tatali*, *nanali*, and *halwuhalwu* can modify degree-achievements, where they derive the same type of interpretation. They yield a gradual change, which especially refers to a change where some degree increases or decreases through the whole event, consistently, in contexts. The scalar change has to be continued through all the temporal intervals in order to make the whole scalar change consistent. Especially, we call this an **incremental** interpretation.

(41) **Degree-achievements**

a. nalssi-ka {tatali/nanali/halwuhalwu} (te) **chwuwecy**-ess-ta.
weather-NOM {MMi/DDi/1D1D} (more) become.cold-PST-DECL
'The weather became colder {month by month/day after day/(from) day to day}'

b. cali-ka {tatali/nanali/halwuhalwu} (te) **ttattushaycy**-ess-ta.
seat-NOM {MMi/DDi/1D1D} (more) become.warm-PST-DECL
'The seat became warmer {month by month/day after day/(from) day to day}'

The three pluractional adverbs derive an incremental interpretation from the composition with events with comparatives as well as degree-achievements.

(42) **Events with Comparatives**

a. Mina-ka **ta-tal-i** cali-lul
M.-NOM month-month-ADV seat-ACC
te ttattusha-n kos-ulo olmky-ess-ta
more warm-ADN place-DIR move-PST-DECL

'Mina moved her seat to a warmer place month by month'

b. Mina-ka **na-nal-i** cali-lul
M.-NOM day-day-ADV seat-ACC
(te) ttattusha-n kos-ulo olmky-ess-ta
more warm-ADN place-DIR move-PST-DECL
'Mina moved her seat to a warmer place day after day'

c. Mina-ka **halwu-halwu** cali-lul
M.-NOM 1day-1day seat-ACC
te ttattusha-n kos-ulo olmky-ess-ta
more warm-ADN place-DIR move-PST-DECL
'Mina moved her seat to a warmer place (from) day to day'

Here, we point out that although these adverbs are all grammatical in environments of achievement or with comparatives, each adverb targets a different semantic component from the others. This is because each adverb has its own semantic condition. In (43a), for example, the event of change itself is sufficient for the BOUNDEDNESS of *tatali*. *Nanali* in (42b) and (43b) forces the interpretation of gradual change whether there is comparative marker *te* 'more' or not; whereas, *tatali* and *halwuhalwu* in (42) can have such a reading only when the comparative marker *te* explicitly exists. In (43c), the DIVISIVE-PATH condition of *halwuhalwu* is satisfied by the path which changes occur along.

(43) a. ***Tatali* targets a change.**
Mina-ka ta-tal-i cali-lul **olmky**-ess-ta.
M.-NOM month-month-ADV seat-ACC move-PST-DECL
'Mina moved her seat month by month'

b. ***Natali* targets a scalar change.**

Mina-ka	na-nal-i	cali-lul			
M.-NOM	day-day-ADV	seat-ACC			
		∅/**te**	**ttattusha-n**	**kos-ulo**	**olmky**-ess-ta.
		more	warm-ADN	place-DIR	move-PST-DECL

'Mina moved her seat to a warm**er** place day after day'

c. ***Halwuhalwu* targets a path.**

Mina-ka	halwu-halwu	cali-lul			
M.-NOM	1day-1day	seat-ACC			
		*(**te**)	**ttattusha-n**	**kos-ulo**	**olmky**-ess-ta.
		more	warm-ADN	place-DIR	move-PST-DECL

'Mina moved her seat to a warmer place (from) day to day'

(44) *Tatali* is restricted to the domain of BOUNDED Events.
Nanali is restricted to the domain of SCALAR CHANGES.
Halwuhalwu is restricted to the domain of (Cumulative and) DIVISIVE Events.

As for degree-achievement predicates, likewise, it is also a coincidence that they act as an intersection of *tatali*, *nanali*, and *halwuhalwu*. Degree-achievements can be decomposed into an event with an inherent comparative (Dowty 1979:88; von Stechow 1996:126). Zubizarreta and Oh (2007) give an account for the deajectival -*eci*- constructions with a gradable adjective, which correspond to the majority degree-achievement predicates in Korean, as follows: (i) the -*eci*- construction is interpreted as denoting a movement to a relative *endpoint*, (ii) this relative-endpoint interpretation arises from the presence of an abstract *comparative* marker, and (iii) the -*eci*- construction can take scalar predicates as its *path* argument. These three points are targeted respectively by *tatali*, *nanali*, and *halwuhalwu*.

Meanwhile, degree-achievement predicates satisfy both of the domain restrictions of *tatali* and of *halwuhalwu*. However, *tatali* requires the predicate to be bounded, which is non-S-cumulative and non-divisive. On the other hand, *halwuhalwu* requires the predicate to be cumulative and divisive. According to Piñón (2008), whether the predicate is cumulative or non-cumulative can be determined based on the setting of existential closure. When an introduced variable is not existential-closed, it is eliminated or set with the different values given from the context. Here, degree-achievement predicates can be switched as either cumulative or non-cumulative.

(45) thum-i pelecy-ess-ta. **(Degree Achievements)**

gap-NOM widen-PST-DECL

'The gap widened'

≈ a. 'There has never been a gap, but a gap is formed as a result of change now' (Bounded event)

b. 'There has been a gap, and the width of the gap has changed by some fixed degree' (Bounded event)

c. 'There has been a gap, and the width of the gap is changed in some degree'(Unbounded event)

Degree-achievement predicates match the semantic conditions with change depending on which adverbs they appear with. Actually, there are non-S-cumulative, non-divisive, but cumulative predicates. For example, degree-achievements with the distributive share marker *-ssik*.

(46) a. kion-i ta-tal-i **<u>sam-to-?(ssik)</u>** oll-ass-ta.
temperature-NOM month-month-ADV three-degree-(DSH) increase-PST-DECL
'The temperature increased by 3 degrees month by month'

b. kion-i na-nal-i **<u>sam-to-*(ssik)</u>** oll-ass-ta.
temperature-NOM day-day-ADV three-degree-(DSH) increase-PST-DECL
'The temperature increased by 3 degrees day by day'

c. kion-i halwu-halwu **<u>(*sam-to-ssik)</u>** oll-ass-ta.
temperature-NOM 1day-1day (three-degree-DSH) increase-PST-DECL
'The temperature increased ~~by 3 degrees~~ from day to day'

The degree-achievement verb with a reading as in (45a) acts as an achievement and satisfies the boundedness condition of *tatali*. In the reading in (45b), on the other hand, the degree-achievement verb is cumulative and divisive. This is because the degree of change is not bounded. The degrees which are derived from the change form a path of change. The cumulativity and divisivity of degree achievement is the property of path belonging to the degree achievement. As for *halwuhalwu*, the covering event is not individualized even if it is a type of change. This results in a 'continuative' change in modifying degree achievements. Here, the continuative change occurs along the path. Picking up on inherently divisive activities and divisivized activities, the unceasingly prolonged interpretation '*once it stops, the event cannot restart*' is related to the unceasing continuity of time, which is a path, too.

3.3 The Semantic Typology of Pluractionality

3.3.1 Repetition, Incrementality, and Continuation

As shown above, we encounter three types of interpretations when we deal with three adverbs in the sentence. *Nanali* derives an **incremental** interpretation, which refers to a change where some degree increases or decreases through a whole event, consistently, in contexts. Scalar changes occur through all the days, and a scalar change in a day should be connected to previous day's change and to the next day's, in order to make the whole scalar change consistent. *Halwuhalwu* and *tatali* 'month.month' also show this type of incremental interpretation, but they are not the same as *nanali* in the following two points. First, they need explicit scalar change expressions in order to derive an incremental interpretation. Second, they can derive other readings besides an incremental interpretation. *Tatali* derives a **repetitive** reading by modifying a non-scalar and bounded event. *Halwuhalwu* derives a prolonged interpretation, which is a **continuative** reading, by modifying a non-scalar and divisive event.

(47)

		Repetitive reading	Incremental reading	Continuative reading
tatali	**Boundedness**	OK	with an explicit scalar change expression	*
nanali	**Scalar Change**	*	OK	*
halwuhalwu	**Divisive-Path**	*	with an explicit scalar change expression	OK

The set of these three readings – the repetitive reading, incremental reading and continuative reading – are not an unfamiliar story in the field of pluractionality. According to van Geenhoven (2005), West Greenladic Eskimo (WG) illustrates frequentative, continuative, and gradual (or incremental) aspect by means of verbal affixes. van Geenhoven (2005) considers these aspects as pluractional operators and analyzes unbounded pluractionality as the source of their atelicity.

(48) West Greenladic Eskimo (van Geenhoven 2005)

a. **Frequentative Aspect Marker**

Nuka ullaap tungaa

Nuka ullaa-p tunga-a

N.-ABS morning-ERG direction-3SG.SG.ABS

tamaat sanioqqut**tar**poq.

tama-at saniuqqut-**tar**-puq

all-3SG go.by-**repeatedly**-IND.[-tr].3SG

'Nuka went by repeatedly the whole morning'

b. **Continuative Aspect Marker**

Unnuaq tamaat erinarsor**tuar**poq

unnuaq tama-at irinarsur-**tuar**-puq

night.ABS all-3SG sing-**continuously**-IND.[-tr].3SG

'He sang continuously all night long (without a break, nonstop).'

c. **Gradual Aspect Marker**

Alli**galuttuinnar**poq. (Fortescue 1984:282)

alli-galuttuinnar-puq

get.big-**more&more**-IND.[-tr].3SG

'He is getting bigger and bigger'

In fact, the term *continuation* is not sufficient to capture the readings from the examples of *halwuhalwu*. We mentioned the term *prolonged*, which refers to substaining one's life or one's activity. One characteristic of prolongation is the *unceasingness*. It does not permit any break between the events; once it stops, it ends and cannot restart. An event already has this characteristic before it is modified by *halwuhalwu*. The predicate should be a divisive event. On the other hand, WG *irinarsur*- 'sing' in (48b) is not divisive.

The prolonged interpretation from semantic environments like *take it* or *live* is shared by *day by day* in English. There are several *day*-unit adverbs in English which are counterparts to *nanali* and *halwuhalwu* in Korean. According to the result of the comparison between *day by day* and *day after day*, which is researched in COCA (*Corpus of Contemporary American English*, a 450 million word corpus of American English), the predicates such as *live*, *take it*, and *wait* rank high on the list of words which appear with *day by day* but not with *day after day*. The semantic domain of *day by day* seems closer to the one of *halwuhalwu* than *nanali*.

Going back to the examples of WG, they do not show the type of semantic conditions which *tatali*, *nanali*, and *halwuhalwu* have.

(49) West Greenlandic Eskimo (van Geenhoven 2005)

a. Anna ullaap tungaa tamaat anisarpoq.

Anna ullaa-p tunga-a tama-at ani-**tar**-puq

A.-ABS morning-ERG direction-3SG.SG.ABS all-3SG leave-**repeatedly**-IND.[-tr].3SG

'Anna left (and returned) repeatedly the whole morning'

b. Upernar**iartuaar**poq. (Fortescue 1984:282)

Upirna-**riartuaar**-puq

be.spring[10]-**gradually**-IND.[-tr].3SG

'It is gradually getting to be spring'

As mentioned briefly in Section 3.2.1, *tatali* yields a "regularly" repetitive reading. Here, regularity from *tatali* refers to the meaning that there is an interval with the size of month between the two immediately adjacent cover events. This is different from the meaning of *every month* where 'there is some event in a month', where it only matters whether there is an event in the interval with the size of month, but neither where the cover event is located in the interval with the size of month nor how far the cover event is from the immediately adjacent cover events.[11] If we assume a situation where thirty cover events converge in a certain month, then the sentence with *maytal* 'every month' is true while the sentence with *tatali* is false.

Although semantic theories have been suggested in order to describe various types of pluractionality above Lasersohn's skeleton, such as temporal, spatial, and participant-based pluractional, sometimes they are tied down by morphological characteristics. When lexical items in the same morphological pattern show a

[10] As the glossary of *upirna*, Fortescue (1984:282) uses the term 'become-spring', which is a change of state, rather than 'be.spring', which is a state.

[11] 'Between the two immediately adjacent cover events' can be described precisely as 'from the end point of some cover event to the end point of the immediately following cover', rather than 'from the end point of some cover event to the start point of the immediately following cover'. Based on the end points of cover events, we can capture the regularly repetitive reading of *tatali* regardless of the temporal size of cover event.

similarity in their meanings, a sample study based on several lexical items has the ability to overgeneralize properties observed from a part into the whole morphological class. This kind of overgeneralization is committed by relying on an isomorphism between morphological and semantic structure. We should examine the general property of pluractionality among various elements consisting of the different lexical meanings. If we cannot deal with all of the lexical items in the class, then it is important which items are selected as representative of the class. Of course, a property observed from the majority of classes could be a possible candidate for a generalization; however, we should bear the minority of classes in mind as well. Identification of counter-examples helps in elaborating an analysis by rejecting overgeneralized candidates. On the other hand, the purpose of description should not be confined to each individual item, which just constructs another translated dictionary with the same size of word list. For example, van Geenhoven's formulas focus on describing the lexical meaning of each aspect marker, but put the distinctive elements of meaning aside by introducing a new plural operator for each lexical item. The origin of differences among the lexical meanings remains unexplained. This study will give a unified explanation for the pluractional semantics based on the systematic similarities and differences among individual lexical meanings.

3.3.2 Plural Operators

Beck and von Stechow (2007) consider pluractional adverbials – *piece by piece* or *dog after dog* – not as plural operator themselves, but as triggers and restrictors of invisible plural operators (**PL**).

(50) **Plain ⟨e, ⟨v, t⟩⟩ pluralization** (Beck and von Stechow 2007:234f)

a. [[**PL**]] = λCov.λR.λx.λe: PART(Cov, e + x). **[λx′.λe′. Cov(e′) & Cov(x′) & R(x′)(e′)](x)(e)[12]

b. John ate the cake piece by piece.

[$_{vt}$ [the cake] [PL$_{Cov1}$ [$_{evt}$ piece by piece$_{Cov1}$ [$_{evt}$ λ2 [John ate t$_2$]]]]]

[[piece by piece **]]** = λCov.λR$_{\langle e, \langle v, t\rangle\rangle}$.λx.λe. Cov(x) & Cov(e) & R(x)(e)
& x is a piece

λe. ⟨e, the_cake⟩ ∈ **[λy′.λe′. Cov(y′) & Cov(e′) & y′ is a piece
& John ate y′ in e′]

(51) **Sequence ⟨e, ⟨v, t⟩⟩ pluralization** (Beck and von Stechow 2007:234)

a. [[**PLseq**]] = λCov.λR.λx.λe. Cov[e] is a sequence and Cov[x] is a sequence & **[λx′.λe′. Cov(x′) & Cov(e′) & R(x′)(e′)](x)(e)

b. These three dogs entered the room one after the other.

[these 3 dogs [**PL**$^{\mathbf{seq}}_{Cov}$ λx [$_{vt}$ x [$_{evt}$ [$_{evt}$ entered the room] [$_{\langle evt\rangle\langle evt\rangle}$ one after the other x]]]]]

[[one after the other x]]^g = λR$_{\langle e, \langle v, t\rangle\rangle}$.λy.λe. R(y)(e) & R((pred(g(x)))(pred(e))

[[these 3 dogs [**PL**$^{\mathbf{seq}}_{Cov}$ λx [$_{vt}$ x [$_{evt}$ [$_{evt}$ entered the room] [$_{\langle evt\rangle\langle evt\rangle}$ one after the other x]]]]]]^g

= λe. ⟨3D, e⟩ ∈ [[**PL**$^{\mathbf{seq}}_{Cov}$]] (λx.λe′. x enter the room in e′ & pred(x) enter the room in pred(e′))

---

[12] (Beck and von Stechow 2007:228)
Let R be a relation of type ⟨e, ⟨v, t⟩⟩. Then for any x, e: [**^{C}R](x)(e) = 1 iff
∀x′ [x′ ⩽ x & C(x′) → ∃e′ [e′ ⩽ e & C(e′) & R(x′)(e′)]] &
∀e′ [e′ ⩽ e & C(e′) → ∃x′ [x′ ⩽ x & C(x′) & R(x′)(e′)]]

= λe. Cov[3D] is a sequence & Cov[e] is a sequence & ⟨3D, e⟩ ∈ **[λx.λe′. Cov(x) & Cov(e′) & x enter the room in e′ & pred(x) enter the room in pred(e′)]

(52) **Existentially shifted PL^{seq}** (Beck and von Stechow 2007:243)

a. [[**PL**$^{\exists}$]] = λCov.λR.λe. ∃z [Cov[e] is a sequence and Cov[z] is a sequence & **[λz′.λe′. Cov(z′) & Cov(e′) & R(z′)(e′)](z)(e)]

b. She washed dog after dog.

[**PL**$^{\exists}_{Cov}$ [[dog after dog][$_{\langle e, \langle v, t\rangle\rangle}$ λx. she washed x]]]

[[dog after dog]] = λR.λy.λe. R(y)(e) & dog(y) & R(pred(g(x)))(pred(e))

Meanwhile, Beck and von Stechow (2007) identify AND as a plain PL operator; especially, the domain of which is restricted to cumulative and non-divisive predicates.

(53) **Plain ⟨v, t⟩ pluralization**

a. [[**PL**]] = λCov.λP_{vt}. λe. *[λe′. Cov(e′) & P(e′)](e)

b. [[**AND**]] (Beck and von Stechow 2007:244)

= λCov.λP_{vt}: P is cumulative & P is not divisive. λe. *[λe′. Cov(e′) & P(e′)](e)

c. (Beck and von Stechow 2007:245)

It became colder and colder.

It **AND**$_{Cov}$ became colder

λe. e∈ *[λe′. Cov(e′) & become_colder(e′)]

become_colder(e) = 1 iff it is colder at the end of e than at the beginning of e

(von Stechow 1996)

d. (Beck 2012:69)

Sally ran and ran.

"The situation can be divided into subevents in each of which Sally ran."

[$\mathbf{PL}_{\langle v, t\rangle}$ Cov [$_{VP\ \langle v, t\rangle}$ Sally ran]]

$\lambda E.\ E \in [{}^*\lambda e.\ Cov(e)\ \&\ ran(S)(e)]\ \&\ \forall e1e2[e1 \leq E\ \&\ e2 \leq E\ \&\ Cov(e1)\ \&\ Cov(e2) \rightarrow \neg\,[\tau(e1) \circ \tau(e2)]$

e. German (Beck 2012:69-70)

Wir warteten Stunde um Stunde.

we waited hour by hour (for hours).

'The situation can be divided into subevents which last an hour and have us waiting'

[[[$\mathbf{PL}_{\langle v, t\rangle}$ Cov] [$_{\langle v, t\rangle}$ we waited]] [$_{\langle v, t\rangle}$ hour by hour $_{Cov}$]]

$\lambda E.\ E \in [{}^*\lambda e.\ Cov(e)\ \&\ we\_wait(e)\ \&\ \forall e1e2[e1 \leq E\ \&\ e2 \leq E\ \&\ Cov(e1)\ \&\ Cov(e2) \rightarrow hour(\tau(e1))\ \&\ hour(\tau(e2))\ \&\ \neg\,[\tau(e1) \circ \tau(e2)]]$

$[[\text{hour by hour}]] = \lambda Cov.\lambda E.\ \forall e1e2[e1 \leq E\ \&\ e2 \leq E\ \&\ Cov(e1)\ \&\ Cov(e2) \rightarrow hour(\tau(e1))\ \&\ hour(\tau(e2))\ \&\ \neg\,[\tau(e1) \circ \tau(e2)]$

"Cov partitions $\tau(E)$ into hour-long subevents"

(54) **Sequence ⟨v, t⟩ pluralization**

a. (Beck 2012:75) [13]

She sneezed time after time/again and again/one time after the other.

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[13] Originally, Beck and von Stechow (2007) treat "time after time/again and again" under the plain PL operator **AND**:

a. Wir warteten Stunde um Stunde.
we waited hour for hour
'We waited for hours.'

b. She surprised us time after time.

c. Sie hat uns immer wieder ueberrascht.
she has us always again surprised
'She surprised us again and again'

"The situation can be divided into a sequence of subevents such that she sneezed in each subevent and in its predecessor."

[$\mathbf{PL}^{seq}_{\langle v, t\rangle}$ Cov [she sneezed] [time after time]]

λE. Cov[E] is a sequence & E ∈ [*λe. Cov(e) & she sneezed in (e) & she sneezed in pred(e)]

We will follow Beck and von Stechow's (2007) formal representation basically, but will revise the details for the following reasons. First, we have to figure out what type of PL operator is selected for *tatali*, *nanali* and *halwuhalwu*. In contrast with the pattern *(preposition-)N-preposition-N* in European languages, these reduplicative adverbs in Korean have no additional morphological marker determining which PL operator checks each of the adverbs. Considering a preposition as a clue is inapplicable in determining a PL operator for Korean adverbs. Therefore, both a plain PL operator and a sequential PL operator can be a candidate to check *tatali*, *nanali* and *halwuhalwu*, so that another criterion is required to determine a PL operator for them. Second, Beck and von Stechow's account has assigned PL operators according to the patterns of adverbials, so that one pattern of adverbial sticks to only one type of PL operator. For example, it fails to expect an incremental reading from N-*by*-N because a plain pluractional operator should be specified due to the existence of *by*.

Likewise, *tatali*, *nanali*, and *halwuhalwu* have an incremental interpretation, so that the sequential type of PL operator is basically adequate. Besides, *tatali* and *halwuhalwu* have a repetitive and a continuative interpretation respectively, and do not force the sentence without a comparative marker to an incremental interpretation. This difference between *tatali*/*halwuhalwu* and *nanali* results in

introducing two types of pluractional operators (a revision of Beck and von Stechow's (2007) style). These differ in whether the cumulative operator is two-placed or three-placed. The former checks *tatali* and *halwuhalwu*; the latter checks *nanali*. While the sequential pluractional operator which *tatali* and *halwuhalwu* require contains a two-place cumulation operator (**) licensing two types of primitives, i.e., event *e* and interval *i*, the sequential pluractional operator of *nanali* contains a three-place cumulation operator (***) licensing three types of primitives, i.e., degree *d* as well as event *e* and interval *i*.[14]

(55) $[[\ PL^2_{seq}\ ]] = \lambda Cov.\lambda R.\lambda E.\lambda I.\ Cov[E]$ is a sequence $\wedge$ $Cov[I]$ is a sequence
$\wedge \langle E, I\rangle \in [^{**}\lambda e.\lambda i.\ Cov(e) \wedge Cov(i) \wedge R(e)(i)]$

(56) $[[\ PL^3_{seq}\ ]] = \lambda Cov.\lambda R.\lambda D.\lambda E.\lambda I.\ Cov[D]$ is a sequence
$\wedge$ $Cov[E]$ is a sequence $\wedge$ $Cov[I]$ is a sequence
$\wedge \langle D, E, I\rangle \in [^{***}\lambda d.\lambda e.\lambda i.\ Cov(d) \wedge Cov(e) \wedge Cov(i) \wedge R(d)(e)(i)]$

3.3.3 The Semantic Representations of Pluractionality

Before presenting the denotations of the three adverbs, let us mention another study on the English pluractional adverbial N-*by*-N. Henderson's (2012) scale account incorrectly limits the whole semantic environment of English adverbials

[14] Cumulation operators *n (Sternefeld (1998))
Let R be an n-place relation. Then [*n R] is the smallest relation R′ such that the conditions in (i) and (ii) are satisfied.
(i) $R' \supseteq R$
(ii) for all $\langle x_1,\ldots,x_n\rangle$ and $\langle y_1,\ldots,y_n\rangle$:
if $\langle x_1,\ldots,x_n\rangle \in R'$ and $\langle y_1,\ldots,y_n\rangle \in R'$, then $\langle x_1+y_1,\ldots,x_n+y_n\rangle \in R'$

N-*by*-N to only three types of scalar change verbs – incremental theme verbs, change of state verbs, and inherently directed motion verbs – which is due to dealing only with examples biased toward degree-based pluractionality. This generalization is refuted by N-*by*-N in the non-change environments such as (57).

(57) a. I'm one of hundred of Scots families who wait **day by day** to see if their son or daughter will return unscathed.

b. I live for the moment, **day by day**, not for the past.

The condition of scalar change is not required for the whole class of N-*by*-N, but rather seems to be affected by the semantic properties of the bare noun which is reduplicated. This bare noun has been considered as a measure function providing a unit for pluractionality by the Kennedy-style scale account. Then, individual lexical items of N-*by*-N, which are distinguished from each other by their bare nouns, have different measure functions derived from each noun. The variety of measure functions causes the differences in semantic denotation among individual lexical items of N-*by*-N because they differ in properties of domain for each type of measure function they are applied to, not simply in substitution of a measure function. Incremental theme verbs, pointed out as one type of scalar change verbs by Henderson (2012), are excluded from the environment for *nanali*. This is because the unit noun of *nanali* targets the temporal domain and does not have a role as another measure function to provide a scale for a domain of incremental theme.

The requirement of scalar change predicates is not a general property of pluractionality encompassing all the reduplicative adverbials, but rather dependent on each individual lexical item. Among pluractional adverbs in Korean, only *nanali*

modifies only predicates of indefinite scalar change, which confirms the status of *nanali* as degree-based pluractionality.

Therefore, three pluractional adverbs are defined as follows. Based on Beck and von Stechow's (2007) N-*after*-N, the denotations have two types of primitives, *e* for events and *i* for temporal intervals, in common. A degree variable *d* is additionally introduced into the denotation of *nanali*. The conditions on the semantic domain are defined as well.

(58) a. [[ta-tal-i]]

$= \lambda P$: P is BOUNDED.$\lambda e.\lambda i.\ P(e) \wedge \mathbf{month}(i) \wedge \tau(e) \leq i \wedge \tau(pred(e)) \leq pred(i)$

where P is BOUNDED iff $\forall e \forall e'[[P(e) \wedge e' < e] \rightarrow \neg P(e')] \wedge \exists e \exists e'[P(e) \wedge P(e') \wedge \neg\ e \sqsubseteq e' \wedge \forall e \forall e'[P(e) \wedge P(e') \wedge \mathbf{R(e,e')} \rightarrow P({}^{S}(e \sqcup e'))]]$

b. [[na-nal-i]]

$= \lambda P$: P is SCALAR CHANGE.$\lambda d.\lambda e.\lambda i.\ P(e) \wedge R_p(d)(e) \wedge R_p(pred(d))(pred(e)) \wedge \mathbf{day}(i) \wedge \tau(e) \leq i \wedge \tau(pred(e)) \leq pred(i)$

where P is a SCALAR CHANGE iff P defines an incremental relation R_p;

R_p is an order-preserving map from a poset of events *E* to a strict linear ordered set *S*.

c. [[halwu-halwu]]

$= \lambda P$: P is DIVISIVE.$\lambda e.\lambda i.\ P(e) \wedge \mathbf{day}(i) \wedge \tau(e) \leq i \wedge \tau(pred(e)) \leq pred(i)$

where P is DIVISIVE iff $\forall x \forall y[[P(x) \wedge y \leq x] \rightarrow P(y)]$

Here, we propose that the incremental reading of *nanali* results from a combination of degree pluractionality and temporal pluractionality. A repetitive reading and a continuative reading correspond to temporal pluractionality in (8a).

3.3.4 Repetitive Readings as One-dimensional Pluractionality

Repetition refers to the occurrence of the same event along the time axis. In this case, the existence of plural events is required only on the temporal dimension. In other words, repetition refers to temporally distributed plural events. This corresponds to temporal pluractionality in terms of Cusic's (1981) distributive parameter. Plural events are distributed on the time axis.

(59) [[ta-tal-i]]

$= \lambda P\text{: P is BOUNDED}.\lambda e.\lambda i.\ P(e) \wedge \mathbf{month}(i) \wedge \tau(e) \leq i \wedge \tau(pred(e)) \leq pred(i)$

where P is BOUNDED iff $\forall e \forall e'[[P(e) \wedge e' < e] \rightarrow \neg P(e')] \wedge \exists e \exists e'[P(e) \wedge P(e') \wedge \neg\ e \sqsubseteq e' \wedge \forall e \forall e'[P(e) \wedge P(e') \wedge \mathbf{R(e,e')} \rightarrow P({}^{S}(e \sqcup e'))]]$

(60) a. **Cumulative and Non-divisive:**

*Mina-nun	ta-tal-i	tally-ess-ta.
M.-TOP	month-month-ADV	run-PST-DECL

Intended: 'Mina ran monthly'

b. **Cumulative and Divisive:**

*Mina-nun	ta-tal-i	kitaly-ess-ta.
M.-TOP	month-month-ADV	wait-PST-DECL

Intended: 'Mina wait monthly'

c. **Non-S-cumulative and Non-divisive**:

(i)

Mina-nun	ta-tal-i	**<u>sam khillo-lul</u>**	tally-ess-ta.
M.-TOP	month-month-ADV	three kilometer-ACC	run-PST-DECL

'Mina ran 3 km per month, for several months'

(ii)

Mina-nun	ta-tal-i	**<u>chayk han kwen-ul</u>**	ss-ess-ta.
M.-TOP	month-month-ADV	book one CL-ACC	write-PST-DECL

'Mina wrote one book per month, for several months'

(61) The Repetitive Reading of *tatali*

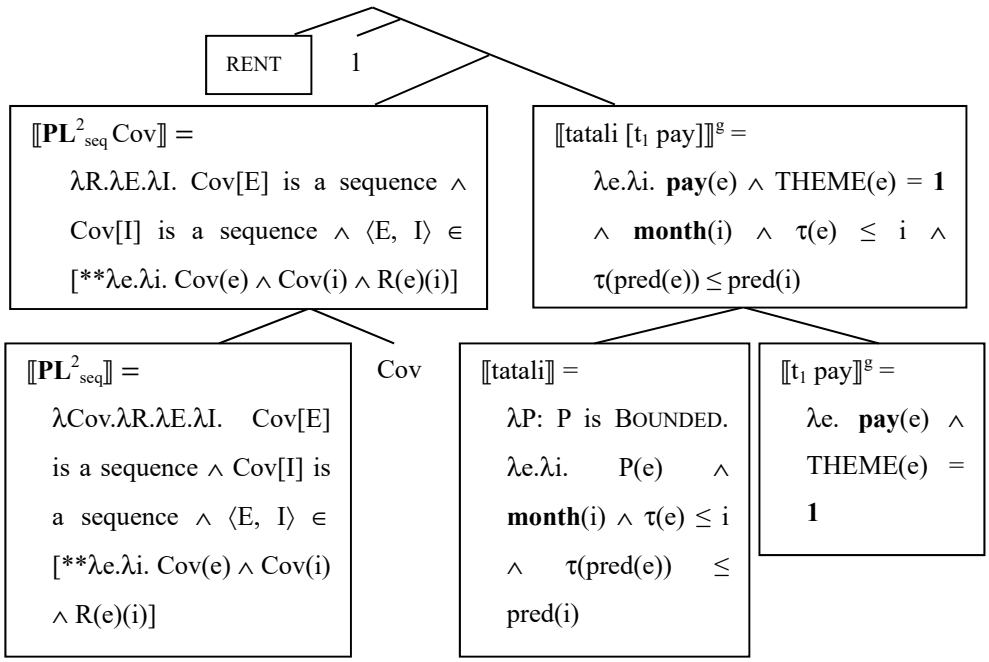
a. cipsey-ka ta-tal-i naka-ss-ta.

rent-NOM month-month-ADV go.out-PST-DECL

'The rent was paid month by month'

b. LF: [[cipsey-ka] [1 [[$\mathbf{PL}^2_{seq}$ Cov] [tatali [t_1 naka-]]]]]

c. λE.λI. Cov[E] is a sequence ∧ Cov[I] is a sequence ∧ ⟨E, I⟩ ∈ [**λe.λi. Cov(e) ∧ Cov(i) ∧ **pay**(e) ∧ THEME(e) = RENT ∧ **month**(i) ∧ τ(e) ≤ i ∧ τ(pred(e)) ≤ pred(i)]



3.3.5 Continuative Readings as One-dimensional Pluractionality

Halwuhalwu modifies a predicate of a divisive event and yields a *prolonged continuation*. *Pethita* 'endure' and *kitalita* 'wait' are also divisive events. Even

though they sometimes seem to have a break, it occurs on the level of events or occasions.

(62) [[halwu-halwu]]

$= \lambda P$: P is DIVISIVE.$\lambda e.\lambda i.\ P(e) \wedge \mathbf{day}(i) \wedge \tau(e) \leq i \wedge \tau(pred(e)) \leq pred(i)$

where P is DIVISIVE iff $\forall x \forall y[[P(x) \wedge y \leq x] \rightarrow P(y)]$

(63) a. **Cumulative and Non-divisive:**

*Mina-nun halwu-halwu tally-ess-ta.

M.-TOP 1day-1day run-PST-DECL

Intended: 'Mina ran daily'

b. **Cumulative and Divisive**:

(i) Mina-nun halwu-halwu kitaly-ess-ta.

M.-TOP 1day-1day wait-PST-DECL

'Mina waited him from day to day'

(ii) Mina-nun halwu-halwu talli-ki-man hay-ss-ta.

M.-TOP 1day-1day run-NML-only do-PST-DECL

'Mina did only running day to day'

c. **Non-S-cumulative and Non-divisive:**

(i) *Mina-nun halwu-halwu sam khillo-lul tally-ess-ta.

M.-TOP 1day-1day three kilometer-ACC run-PST-DECL

Intended: 'Mina ran 3km a day, for several days'

(ii) *Mina-nun halwu-halwu chayk han kwen-ul ss-ess-ta.

M.-TOP 1day-1day book one CL-ACC write-PST-DECL

Intended: 'Mina wrote one book a day, for several days'

(64) The Continuative Reading of *halwuhalwu*

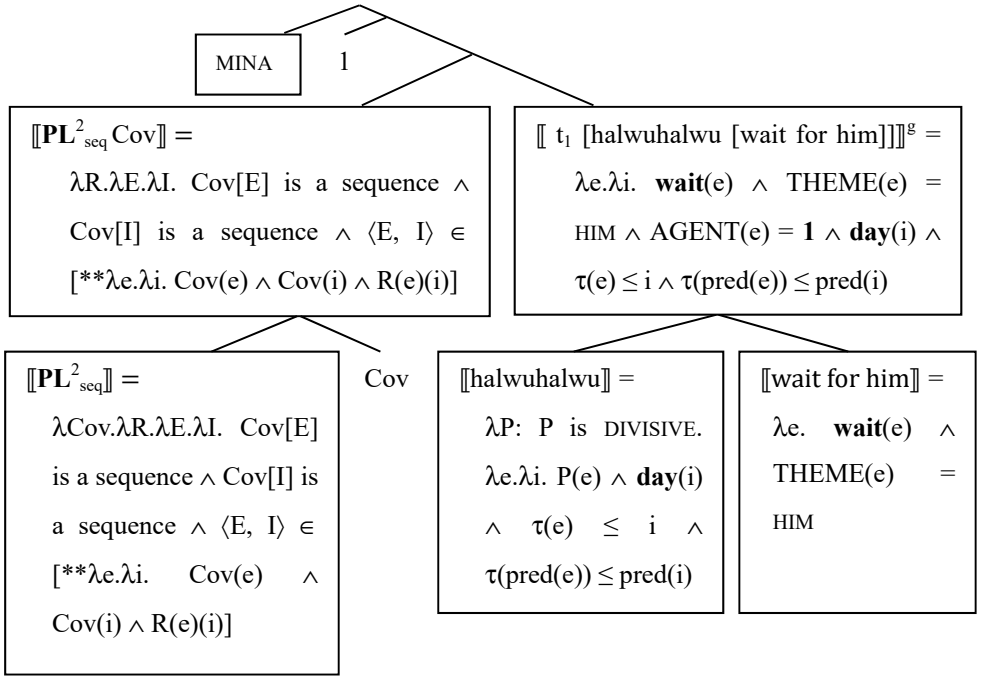
a. Mina-ka halwu-halwu ku-lul kitaly-ess-ta.

M.-NOM 1day-1day him-ACC wait-PST-DECL

'Mina waited him from day to day'

b. LF: [[Mina-ka] [[$\mathbf{PL}^2_{seq}$ Cov] [t_1 [halwuhalwu [ku-lul kitali-]]]]]

c. λE.λI. Cov[E] is a sequence $\wedge$ Cov[I] is a sequence $\wedge$ $\langle$E, I$\rangle$ $\in$ [**λe.λi. Cov(e) $\wedge$ Cov(i) $\wedge$ **wait**(e) $\wedge$ THEME(e) = HIM $\wedge$ AGENT(e) = MINA $\wedge$ **day**(i) $\wedge$ τ(e) $\leq$ i $\wedge$ τ(pred(e)) $\leq$ pred(i)]



3.3.6 Incremental Readings as Two-dimensional Pluractionality

Here, we analyze the incremental reading of *nanali* as the result of a combination of degree pluractionality and temporal pluractionality, and propose the

semantic derivation of bidimensional pluractionality of temporal pluractionality and degree-based pluractionality. We will follow Beck's (2012) formal representation. However, in contrast with the form N-preposition-N appearing in European languages, there is no additional morphological marker in Korean which shows a constraint on subevents (or covers). Furthermore, Beck and von Stechow's (2007) analysis cannot expect 'incremental pluractionality' from N-*by*-N specifying the presence of a plain pluractional operator, so that it is not enough to catch the incremental interpretation of *nanali*.

Incrementality is a change of theme along the time axis. Here, in addition to the temporal dimension, another dimension is necessary to represent a change of theme. Pluractional analysis invites Kennedy-style Scalarity. Plural events are distributed both on the time and scale axes.

Even though the covering condition in (7a) is stricter than others, *nanali* also satisfies this condition on covers in that it requires all the colors participating in the events to be *strictly linear-ordered* – irreflexive, asymmetric, and connected.

(65) *Nanali* modifies an event which is a strictly linear-ordered set of *n*-tuple <d, e>.

Therefore, we propose (66a) for the denotation of *nanali*.

(66) a. [[na-nal-i]]

$= \lambda P$: P is SCALAR CHANGE.$\lambda d.\lambda e.\lambda i.\ P(e) \wedge R_p(d)(e) \wedge$

$R_p(\text{pred}(d))(\text{pred}(e)) \wedge \textbf{day}(i) \wedge \tau(e) \leq i \wedge \tau(\text{pred}(e)) \leq \text{pred}(i)$

where P is a SCALAR CHANGE iff P defines an incremental relation R_p; R_p is an order-preserving map from a poset of events *E* to a strict linear ordered set *S*.

b. R is a strict linear (or total) order on a set S iff: (Partee *et al*. 1990:209,211)

Transitivity: $\forall x \forall y \forall z\ [(Rxy \wedge Ryz) \rightarrow Rxz]$

Irreflexivity: $\forall x\ [\neg Rxx]$

Asymmetry: $\forall x \forall y\ [Rxy \rightarrow \neg Ryx]$

Connectedness: $\forall x \forall y\ [x \neq y \rightarrow (Rxy \vee Ryx)]$

We construct a compositional procedure for *nanali* by borrowing the simple phrasal eventive *-er* and representation from Beck (2012), in order to cover both degree-based pluractionality and temporal pluractionality. The decomposed version of degree-achievements in (68) has a similar structure to the events with the comparative.

(67) Simple phrasal eventive $\textit{-er}_{\langle v, \langle\langle v,\langle d,t\rangle\rangle,\langle v,t\rangle\rangle\rangle}$: $\lambda e'.\lambda R_{\langle v,dt\rangle}.\lambda e.\max(R(e)) > \max(R(e'))$

(68) $[[\ [[\varnothing_{than}\ [\varnothing_{er}]][t_1\ \text{ttattusha]-yci-]]}\ ]]_{\langle v,t\rangle} = \lambda e.\ \max(\lambda d.\text{warm}(\mathbf{1})(e)(d)) > \max(\lambda d.\text{warm}(\mathbf{1})(\text{pred}(e))(d))$

Temporal pluractionality is defined in terms of the two-place cumulative plural operator licensing a mapping relation between the covers of event and of interval.

(69) a. Mina-ka {**halwu-halwu / *na-nal-i**} sal-ass-ta.
M.-NOM {1day-1day / day-day-ADV} live-PST-DECL
'Mina lived a hard life day by day'

b. Mina-ka {**halwu-halwu / na-nal-i**} **himtulkey** sal-ass-ta.
M.-NOM {1day-1day / day-day-ADV} hard live-PST-DECL
i. *halwuhalwu*: 'Mina lived a hard life day by day'
ii. *nanali*: 'Mina's life got hard**er** day by day'

c. Mina-ka {**halwu-halwu / na-nal-i**} **te himtulkey** sal-ass-ta.
M.-NOM {1day-1day / day-day-ADV} more hard live-PST-DECL
'Mina's life got hard**er** day by day'

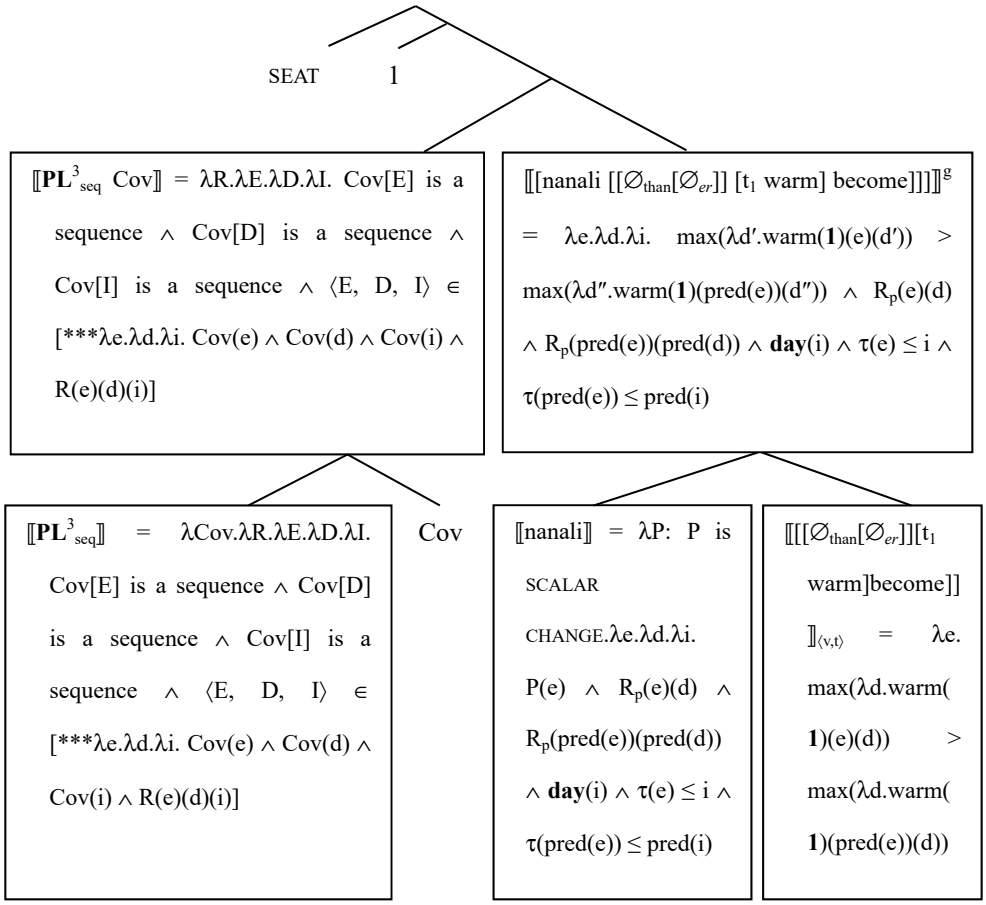
(70) a. cali-ka na-nal-i ttattushay-cy-ess-ta.

seat-NOM day-day-ADV warm-become-PST-DECL

'The seat became warmer day after day'

b. LF: [[cali-ka] [[$\mathbf{PL}^3_{seq}$ Cov] [[nanali] [[$\varnothing_{than}$ [$\varnothing_{er}$]][t_1 ttattusha]-eci-]]]]]

c. **λE.λD.λI**. Cov[E] is a sequence ∧ Cov[D] is a sequence ∧ Cov[I] is a sequence ∧ **⟨E, D, I⟩** ∈ [***λe.λd.λi. Cov(e) ∧ Cov(d) ∧ Cov(i) ∧ max(λd′. warm(SEAT)(e)(d′)) > max(λd″.warm(SEAT)(pred(e))(d″)) ∧ R_p(e)(d) ∧ R_p(pred(e))(pred(d)) ∧ **day**(i) ∧ τ(e) ≤ i ∧ τ(pred(e)) ≤ pred(i)]



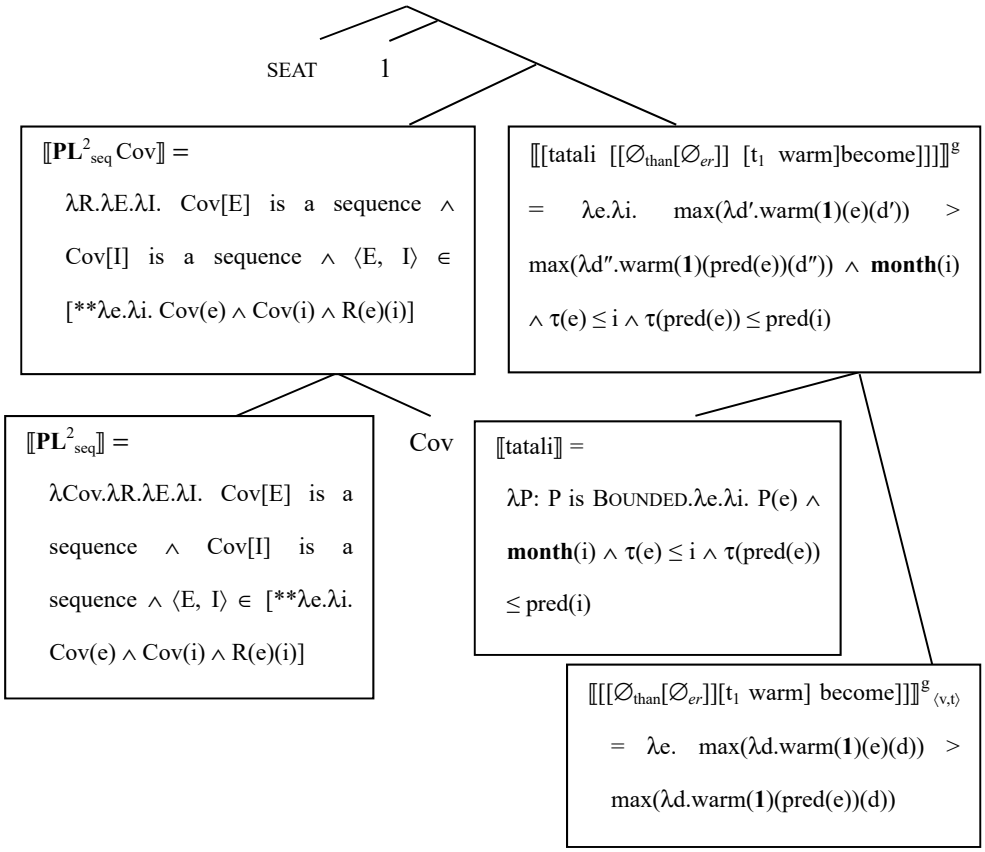
(71) a. cali-ka ta-tal-i ttattushay-cy-ess-ta.

seat-NOM month-month-ADV warm-become-PST-DECL

'The seat became warmer month by month'

b. LF: [[cali-ka] [[$\mathbf{PL}^2_{seq}$ Cov] [[tatali] [[$\varnothing_{than}$ [$\varnothing_{er}$]][t_1 ttattusha]-eci-]]]]]

c. **λE.λI**. Cov[E] is a sequence ∧ Cov[I] is a sequence ∧ **⟨E, I⟩** ∈ [***λe.λi. Cov(e) ∧ Cov(i) ∧ max(λd′. warm(SEAT)(e)(d′)) > max(λd″.warm(SEAT)(pred(e))(d″)) ∧ **month**(i) ∧ τ(e) ≤ i ∧ τ(pred(e)) ≤ pred(i)]



3.4 The Syntactic Hierarchy of Pluractional Adverbs

Among the previous studies on the syntactic representation of classifications of verb meaning, Ogawa and Niinuma (2013) follows Ramchand's (2008) syntactic representation and Thompson (2006) and Travis's (2010) aspectual functional category, and proposes the four-layered syntactic projection InitP > AspP > ProcP > ResP.

(72) (Ramchand 2008:39f,75; cited from Ogawa and Niinuma 2013:229)

a. InitP represents the outer causational projection and is responsible for introducing the external argument.

b. ProcP is the heart of the dynamic predicate, since it represents change through time, and it is present in every dynamic verb.

c. The ResP only exists when there is a result state explicitly expressed by the lexical predicate.

d. The head of ResP is realized by the overt verb which can take a simple locational PP as its complement, and a DP in its specifier functions as the subject of the predicative PP.

Accepting this projection, I propose the basic syntactic position for the three pluractional adverbs as in (73): (i) *tatali* 'month by month' is adjoined into AspP, (ii) *nanali* 'day after day' into ProcP, and (iii) *halwuhalwu* '(from) day to day' into ResP.

(73) …[$_{AspP}$ tatali [… [$_{ProcP}$ nanali [… [$_{ResP}$ halwuhalwu **Res**]] **Proc**]] **Asp**]]…

This hierarchical arrangement of the three adverbs enables us to account for the differences in well-formedness that each adverb shows depending on the

environment by positing each adverb in a different projection from the other two adverbs, and to capture the structural similarity among various constructions where each adverb is permitted, by means of the nature of projection where the adverb is adjoined.

First, *tatali* 'month by month' checks the boundedness feature on *Asp*. This feature is affected by the boundedness of DP. The sentences in (21a) and (15) can be syntactically represented as (74).

(74) a. **Achievements**

ku capci-ka ta-tal-i palkantoy-ess-ta. = (21a)

that magazine-NOM month-month-ADV be.issued-PST-DECL

'The magazine was issued monthly'

[$_{CP}$ …[$_{InitP}$ DP$_{subj}$ [$_{Init'}$ [$_{AspP}$ tatali [$_{Asp'}$ [$_{ProcP}$ [$_{ResP}$ t_{subj} [$_{Res'}$ **Res**]] **Proc**] **Asp** (+telic, +bounded)]] **Init**]] … essta]

b. **Activities with a Measure Phrase**

Mina-ka ta-tal-i **sip khillomithe-lul** tally-ess-ta. = (15)

M.-NOM month-month-ADV 10 km-ACC run-PST-DECL

'Mina ran 10km per month (lit. Mina ran 10km month by month)'

[$_{CP}$ …[$_{InitP}$ DP$_{subj}$ [$_{Init'}$ [$_{AspP}$ tatali [$_{Asp'}$ [$_{ProcP}$ t_{subj} [$_{Proc'}$ [$_{DegP}$ sip khillomithe-lul **Deg**] **Proc**]] **Asp** (−telic, +bounded)]] **Init**]] … essta]

Second, I propose that *nanali* 'day after day' is only adjoined to *ProcP* containing *DegP* within *PathP*, which is the basic structure of degree-achievement predicates (Ramchand 2008), and forces an implicit comparative operator onto the structure as in (23-26). A degree phrase derived from this comparative operator combines with *Path* and satisfies the necessity of an unbounded *PathP* as the

condition of *nanali*. The assumption on *nanali* as an adjunct of *DegP* is refused by the fact that the appearance of *DegP* is not enough for *nanali*. *Nanali* necessarily comes with *DegP*, but is not always able to occur where *DegP* is. What is important/necessary is the type of *DegP*. For instance, *nanali* cannot appear in a comparative sentence such as *he is taller (than before)*, which has *DegP*.

(75) **Activities with a Manner Adverb**

Mina-ka na-nal-i ppall-i tally-ess-ta. = (22a)

M.-NOM day-day-ADV fast-ADV run-PST-DECL

'Mina ran faster day after day (lit. Mina ran fast day after day)'

[$_{CP}$…[$_{InitP}$ DP$_{subj}$ [$_{Init'}$ [$_{AspP}$ [$_{ProcP}$ nanali [$_{Proc'}$ t_{subj} [$_{Proc'}$ [$_{PathP}$ [$_{DegP}$ ∅/te [$_{Deg'}$ ppalli **Deg**]] **Path**] **Proc**]]] **Asp** (+telic)] **Init**]] … essta]

Third, *halwuhalwu* '(from) day to day' is an adjunct of *Path.*

(76) **Divisive Activities**

Mina-ka halwu-halwu <u>kyenty-e</u>ss-ta. = (32c)

Mina-NOM 1day-1day endure-PST-DECL

'Mina took it (from) day to day'

[$_{CP}$…[$_{InitP}$ DP$_{subj}$ [$_{Init'}$ [$_{AspP}$ [$_{ProcP}$ t_{subj} [$_{Proc'}$ [$_{PathP}$ halwuhalwu **Path**] **Proc**]] **Asp** −telic, −bounded)] **Init**]]…assta]

Therefore, these three adverbs target different positions in the structure of change with a comparative phrase.

(77) a. **Achievement with a Comparative Phrase**

Mina-ka panci-lul tatali <u>te pissan kes-ulo</u> pakkwessta.

M.-NOM ring-ACC MMi [more expensive thing-DIR] replaced

'Month by month, Mina changed the ring for a more expensive one'

[$_{CP}$…[$_{InitP}$ DP$_{subj}$ [$_{Init'}$ [$_{AspP}$ tatali [$_{Asp'}$ DP$_{obj}$ [$_{Asp'}$ [$_{ProcP}$ t_{subj} [$_{Proc'}$ [$_{PathP}$ t_{obj} [$_{Path'}$ [$_{DP}$ [$_{DegP}$ te [$_{Deg'}$ pissan **Deg**]] kes] **Path**(ulo)]] **Proc**]] **Asp** (+telic, +bounded)]]] **Init**]] … essta]

b. **Achievements with a Result Phrase**

Mina-ka panci-lul nanali [pissan kes-ulo] pakkwessta.

M.-NOM ring-ACC DDi [expensive thing-DIR] replaced

'Day after day, Mina changed the ring for a more expensive one'

[$_{CP}$…[$_{InitP}$ DP$_{subj}$ [$_{Init'}$ [$_{AspP}$ DP$_{obj}$ [$_{Asp'}$ [$_{ProcP}$ t_{subj} [$_{Proc'}$ nanali [$_{Proc'}$ [$_{PathP}$ t_{obj} [$_{Path'}$ [$_{DP}$ [$_{DegP}$ ∅/te [$_{Deg'}$ pissan **Deg**]] kes] **Path(**ulo)]] **Proc**]]] **Asp** (+telic)]] **Init**]] … essta]

c. **Divisive Activities with a Comparative Phrase**

Mina-ka salm-ul halwuhalwu [te himtulkey] salassta.

M.-NOM life-ACC 1D1D [more hard] lived

'Mina's life got hard**er** day by day'

[$_{CP}$…[$_{InitP}$ DP$_{subj}$ [$_{Init'}$ [$_{AspP}$ DP$_{obj}$ [$_{Asp'}$ [$_{ProcP}$ t_{subj} [$_{Proc'}$ [$_{PathP}$ t_{obj} [$_{Path'}$ halwuhalwu [$_{Path'}$ [$_{DegP}$ te [$_{Deg'}$ [$_{AdvP}$ himtul-] **Deg**]] **Path**(key)]]] **Proc**]] **Asp**(−telic, −bounded)] **Init**]]…assta]

These syntactic representations are supported by means of the different behaviors on word orders by *tatali* and *nanali*. All of the sentences in (78)-(79) could be grammatical if the expressions in the square box was followed a pluractional adverb. However, while the *tatali*-sentences in (78) are acceptable and maintain the same reading as the versions where the squared expressions follow *tatali*, the *nanali*-sentences in (78) are not permitted. This is not because only *tatali* is unconcerned with word order, but because the preceding elements in the *nanali*-

sentences in (78) correspond to *PathP*, which is confirmed by the example in (79). The manner adverb *ppalli* 'in a short time' which corresponds to *PathP* can precede neither *nanali* nor *tatali*.

(78) a. ku capci-nun **twukkep-key** **{tatali /*nanali}** palkantoyessta.
that magazine-NOM [thick-adv] {MMi / DDi} was.issued
'The magazine was issued as a thick volume monthly'
Intended: 'The magazine was issued as a thick volume daily'

b. Mina-ka panci-lul **pissan kes-ulo** **{tatali / *nanali}** pakkwessta.
M.-NOM ring-ACC [expensive thing-DIR] {MMi / DDi} replaced
'Mina changed her ring with expensive ones month by month'
Intended: 'Day after day, Mina changed the ring for a more expensive one'

c. onto-ka **sam-to-ssik** {**tatali / *nanali}** ollassta.
temperature-NOM [three-degree-DSH] {MMi / DDi} increased
'The temperature increased by 3 degrees month by month'

(79) *ku capci-nun **ppall-i** **{tatali/nanali}** palkantoyessta.
that magazine-NOM [fast-adv] {MMi / DDi} was.issued
Intended: 'The magazine was issued in a short time {monthly/daily}'

In addition, we can set the upper limit position on the hierarchy of *tatali*, *nanali*, and *halwuhalwu*. These adverbs are not able to be placed above a (predicative) conjunction phrase of -*ta*(*ka*). But if -*ta*(*ka*) *ha*- is attached, only *tatali* can survive, as in (81b).

(80) a. sengcek-i {**na-nal-i / halwu-halwu**} tteleci-**ta(ka)** oll-ass-ta.
grade-NOM {day-day-ADV / 1day-1day} fall-CONJ rise-PST-DECL

i. ok -*ta*(*ka*) > PLR: 'The grade fell day by day, and then improved'

ii. # PLR > -*ta*(*ka*): 'Day by day, the grade fell and then improved'

b. *sengcek-i {**na-nal-i / halwu-halwu**}

grade-NOM {day-day-ADV / 1day-1day}

tteleci-**ta(ka)** olu-**ta(ka)** **ha**-yss-ta.

fall-CONJ rise-CONJ do-PST-DECL

i. # -*ta*(*ka*) > PLR: 'The grade fell day by day, and then improved'

ii. # PLR > -*ta*(*ka*): 'Day by day, the grade fell and then improved'

(81) a. sengcek-i **ta-tal-i** tteleci-**ta(ka)** oll-ass-ta.

grade-NOM month-month-ADV fall-CONJ rise-PST-DECL

i. OK -*ta*(*ka*) > MMi: 'The grade fell month by month and then improved'

ii. # MMi > -*ta*(*ka*): 'Month by month, the grade fell and then improved'

b. sengcek-i **ta-tal-i** tteleci-**ta(ka)** olu-**ta(ka)** **ha**-yss-ta.

grade-NOM month-month-ADV fall-CONJ rise-CONJ do-PST-DECL

i. OK -*ta*(*ka*) > M.M.i: 'The grade fell month by month and then improved'

ii. OK M.M.i > -*ta*(*ka*): 'Month by month, the grade fell and then improved'

3.5 Identification as Event-internal Pluractionals

Tatali, *nanali*, and *halwuhalwu* share the characteristic that the whole event is unbounded. This is supported by the fact that *tatali* and *nanali* cannot modify quantized degree achievements without the distributive marker -*ssik* and that *halwuhalwu* does not accept a quantized predicate even though -*ssik* is present.

(82) a. kion-i ta-tal-i sam-to*(-ssik) oll-ass-ta.

temperature-NOM month-month-ADV 3-degree-DSH increase-PST-DECL

'The temperature increased by 3 degrees month by month'

b. kion-i na-nal-i sam-to*(-ssik) oll-ass-ta.
temperature-NOM day-day-ADV 3-degree-DSH increase-PST-DECL
'The temperature increased by 3 degrees day by day'

c. kion-i halwu-halwu (*sam-to-ssik) oll-ass-ta. = (46c)
temperature-NOM 1day-1day 3-degree-DSH increase-PST-DECL
'The temperature increased by 3 degrees from day to day'

(83) a. Mina-ka ta-tal-i sip khillomithe-**lul** tally-ess-ta. = (15)
M.-NOM month-month-ADV 10 km-ACC run-PST-DECL
'Mina ran 10km per a month (lit. Mina ran 10km month by month)'

b. Mina-ka ta-tal-i sip khillomithe-**ssik** tally-ess-ta.
M.-NOM month-month-ADV 10 km-DSH run-PST-DECL
'Mina ran 10km per a month (lit. Mina ran by 10km month by month)'

By comparing the degree-achievements without *-ssik* in (82) to the activities with measure phrases in (83), the difference is that the measure phrases in (82) are in *PathP*. *PathP* corresponds to the covering domain of pluractionals. In *PathP*, a measure phrase with a distributive marker quantizes covers of path while the one without a distributive marker quantizes the whole path. *Tatali* and *nanali* have in common a condition that each cover is bounded but the whole event in unbounded. As for *halwuhalwu*, it does not accept a quantized predicate even though *-ssik* is present. Then, the condition of *halwuhalwu* is that both the whole event and its covers are unbounded. In summary, *tatali*, *nanali*, and *halwuhalwu* share the characteristic that the whole event is unbounded.

(84) a. kion-i {tatali/nanali} samto*(-ssik) olassta. = (82a)
temperature-NOM {MMi/DDi} 3-degree(-DSH) increased
'The temperature increased by 3 degrees {month by month/day after day}'

b. $[_{AspP}$ DP_{subj} $[_{Asp'}$ tatali $[_{Asp'}$ $[_{ProcP}$ $[_{PathP}$ t_{subj} $[_{Path'}$ $[_{DistP}$ 3to*(-ssik$_{Dist}$)] **Path**]] **Proc**] **Asp**(+telic, +bounded)]]]

c. $[_{AspP}DP_{subj}$ $[_{Asp'}$ $[_{ProcP}$ nanali $[_{Proc'}$ $[_{PathP}$ t_{subj} $[_{Path'}$ $[_{DistP}$ 3to*(-ssik$_{Dist}$)] **Path**]] **Proc**]] **Asp**(+telic, +bounded)]]

(85) a. kion-i halwuhalwu (*samto-ssik) olassta. = (82b)
temperature-NOM 1D1D (3-degree-DSH) increased
'The temperature increased (*by 3 degrees) day to day'

b. $[_{AspP}$ DP_{subj} $[_{ProcP}$ $[_{PathP}$ t_{subj} $[_{Path'}$ $[_{DistP}$ halwuhalwu $_{Dist}]$ (*$[_{DistP}$ 3to-ssik$_{Dist}$]) **Path**]] **Proc**] **Asp**(−telic, −bounded)]

The unboundedness of the whole event acts as the main criterion in classifying these three adverbs as event-internal pluractionals, with other characteristics, as in (22). Event-internal pluractionals denote groups, in contrast with the sum formation of event-external pluractionals (Wood 2007; Henderson 2012).

3.6 Reduplicative Adverbs with a Temporal Unit Noun in Japanese

We can find three types of reduplicative adverbs in Japanese which corresponds to *tatali*, *nanali*, and *halwuhalwu*: *tuki.duki* 'month by month', *hi.ni.hi.ni* 'day after day', and *hi.bi* '(from) day to day'. However, degree-achievements are not the shared domain of these three adverbs. This is because *tukiduki* cannot modify degree-achievements.

(86) **Degree-achievements**

a. imiron-wa {*tuki-duki/^{ok}hi-bi/^{ok}hi-ni-hi-ni} hattensi-te iru.
semantics-TOP {month-month/day-day/day-LOC-day-LOC} develop-CONJ be
'Semantics is developing day by day'

b. konoha-no akami-ga {*tuki-duki/^{ok}hi-bi/^{ok}hini-hini} masi-te ki-ta.
leaf-GEN redness-NOM {M-M/D-D/D-LOC-D-LOC} increase-CONJ come-PST
'The redness of leaves has increased day by day'

c. {*tuki-duki/?hi-bi/^{ok}hi-ni-hi-ni} nedan-ga agat-ta.
{M-M/D-D/D-LOC-D-LOC} price-NOM increase-PST
'The price increased day by day'

d. {*tukiduki/?hibi/^{ok}hinihini} konoha-ga akaku nat-ta.
{M-M/D-D/D-LOC-D-LOC} leaf-NOM red become-PST
'{A leaf/Leaves} became redder day by day'

Tukiduki has narrower domain than *tatali*. There are achievements and accomplishments with which *tatali* is permitted with but *tukiduki* is not. Also, *tukiduki* is not permitted with activities with a measure phrase. The boundedness condition is not enough to capture the semantic domain of *tukiduki*.

(87) **Achievements (I)**

a. *koinu-ga {*tuki-duki/*hi-bi/*hi-ni-hi-ni} **umare**-ta.
puppy-NOM {M-M/D-D/D-LOC-D-LOC} be.born-PST
'Puppies were born _____'

b. *kagi-ga {*tuki-duki/*hi-bi/*hi-ni-hi-ni} **naku nat**-ta.
key-NOM {M-M/D-D/D-LOC-D-LOC} disappear-PST
'This store changed the menu _____'

c. *gekkansi-ga {*tuki-duki/*hi-bi/*hi-ni-hi-ni} **hakkoosare**-ta.
monthly.magazine-NOM {M-M/D-D/D-LOC-D-LOC} be.published-PST
'The monthly magazine was published _____'

d. *Taroo-wa {*tuki-duki/*hi-bi/*hi-ni-hi-ni} yubiwa-o **kae**-ta.
Taro-NOM {M-M/D-D/D-LOC-D-LOC} ring-ACC change-PST
'Taro changed his ring _____'

(88) **Accomplishments**

a. *Taroo-wa {*tuki-duki/*hi-bi/*hi-ni-hi-ni} **tatemono-o tate**-ta.
Taro-TOP {M-M/D-D/D-LOC-D-LOC} building-ACC build-PST
'Taro built a building _____'

b. *Taroo-wa {*tuki-duki/*hi-bi/*hi-ni-hi-ni} **hon-o kai**-ta.
Taro-TOP {M-M/D-D/D-LOC-D-LOC} book-ACC write-PST
'Taro wrote a book _____'

c. *Taroo-wa {*tuki-duki/*hi-bi/*hi-ni-hi-ni} **san kirometa-o hasit**-ta.
Taro-TOP {M-M/D-D/D-LOC-D-LOC} 3 km-ACC run-PST
'Taro ran 3km _____'

Tukiduki requires regularity. That is, there should be regular intervals among the covering events. The type of events which can be modified by *tukiduki* is so-called monthly events, e.g. payment, salary, remittance, and delivery. This type is also the most canonical example in the domain of *tatali*.

(89) **Achievements (II)**

a. Taroo-wa {^{ok}tuki-duki/*hi-bi/*hi-ni-hi-ni} sen'en **harat**-ta.
Taro-TOP {M-M/D-D/D-LOC-D-LOC} thousand.yen pay-PST
'Taro paid 1000 yens month by month'

b. arubaitodai-ga {[ok]tuki-duki/*hi-bi/*hi-ni-hi-ni}
part.time.pay-NOM {M-M/D-D/D-LOC-D-LOC}
goman'en-zutu **nyuukin-sareru**.
50000.yen-DSH be.deposited
'The pay of part time job is deposited 50000 yens monthly'

c. {[ok]tuki-duki/*hi-bi/*hi-ni-hi-ni} itiwari **waribikisareru** ryookin puran.
{M-M/D-D/D-LOC-D-LOC} 10% offer.a.discount charge plan
'The monthly plan offering a 10% discount'

d. gekkansi-ga {[ok]tuki-duki/*hi-bi/*hi-ni-hi-ni} **todoku**.
monthly.magazine-NOM {M-M/D-D/D-LOC-D-LOC} reach
'The monthly magazine is arrived monthly'

Hibi is comparable to *halwuhalwu* rather than *nanali*. This shows that the similarity in meaning does not go together with similarity in morphological structure. In Korean, *tatali* and *nanali* have the same morphological structure as N.N.-*i* (even in the deletion of the coda in the first syllable), but *halwuhalwu* has a different structure from them: simple reduplication without adverbial sufix -*i*. In Japanese, *tukiduki* and *hibi* have the same morphological structure, with a simple reduplication of the unit nouns *tuki* 'moon' and *hi* 'day', but *hinihini* is different from them – the reduplicated base is the unit noun *hi* with the locative *ni*. In fact, from only the examples with degree-achievements in (86), it is not clear which adverb *hibi* is similar to between *nanali* and *halwuhalwu*, because they have the same type of incremental reading from the composition with the same type of event. In the case of other types of events, however, *hibi* shows the same condition as *halwuhalwu*, which is that modified events should be divisive. Also, *hibi* yields a continuative reading when modifying divisive activities.

(90) a. Taroo-wa {*tuki-duki/^{ok}hi-bi/*hi-ni-hi-ni} **kuitunai**-da.
Taro-TOP {M-M/D-D/D-LOC-D-LOC} subsist-PST
'Taro subsisted from day to day'

b. Taroo-wa sensoo-ni it-ta titioya-ga kaet-te kuru hi-o
Taro-TOP war-LOC go-PST father-NOM return-CONJ come day-ACC
{*tuki-duki/^{ok}hi-bi/*hi-ni-hi-ni} **matinozon**-de i-ta.
{M-M/D-D/D-LOC-D-LOC} long.for-CONJ be-PST
'Taro was longing for the day of his father's return from day to day'

c. Taroo-wa hitorimi-no sabisisa-ni
Taro-TOP singleness-GEN loneliness-DAT
{*tuki-duki/^{ok}hi-bi/*hi-ni-hi-ni} **tae**-ta.
{M-M/D-D/D-LOC-D-LOC} endure-PST
'Taro endured the loneliness of single life from day to day'

On the other hand, *hinihini* in Japanese corresponds to *nanali* in Korean in that this adverb requires scalar change. The covering events should be strictly ordered by forming the whole gradual change. This is supported by the aspect coercion from change to directed change.

(91) a. mati-no yoosu-ga {*tuki-duki/^{ok}hi-bi/^{ok}hi-ni-hi-ni} **kawat**-te iku.
street-GEN shape-NOM {M-M/D-D/D-LOC-D-LOC} change-CONJ go
(i) *hibi*: 'The street scene has been changing from day to day'
(ii) *hinihini*: 'The street scene has been changing **in a certain direction** day after day'

b. rankingu-ga {*tuki-duki/^{ok}hi-bi/^{ok}hi-ni-hi-ni} **kawaru**.
ranking-NOM {M-M/D-D/D-LOC-D-LOC} change
(i) *hibi*: 'The ranking changes from day to day'

(ii) *hinihini*: 'The ranking changes **<u>in a certain direction</u>** day after day'

Meanwhile, *hinihini* is not exactly the same as *nanali*. *Hinihini* behaves together with *nanali* in these cases: neither of them is permitted with Scalar States without a change while both of them are permitted with scalar Change of State. However, *hinihini* is not permitted with non-scalar changes of location, while *nanali* is okay with them. Based on this, we can assume that *hinihini* does not force scalar expressions to have a comparative operator and has only explicit scalar change predicates in the domain.

(92) a. Taroo-wa {*tuki-duki/*hi-bi/*hi-ni-hi-ni} hasiru-no-ga <u>hayai</u>.
Taro-TOP {M-M/D-D/D-LOC-D-LOC} run-thing-NOM fast
'As for Taro, his running is fast _____'

b. Taroo-wa {*tuki-duki/?hi-bi/[ok]hi-ni-hi-ni} hasiru-no-ga <u>haya**ku nat**</u>-ta.
Taro-TOP {M-M/D-D/D-LOC-D-LOC} run-thing-NOM fast become-PST
'As for Taro, his running is fast _____'

c. Taroo-wa {*tuki-duki/*hi-bi/*hi-ni-hi-ni} kaisya-ni <u>hayaku</u> tui-ta.
Taro-TOP {M-M/D-D/D-LOC-D-LOC} company-LOC early arrive-PST
'Taro arrived at the company early _____'

To sum up, *tukiduki* is restricted to the domain of Bounded Events having Regular Intervals among the covering events. *Hinihini* is restricted to the domain of strictly-ordered changes. *Hibi* is restricted to the domain of (cumulative and) divisive events.

(93) Japanese

	Repetitive Reading	Incremental Reading	Continuative Reading
tukiduki **BOUNDEDNESS**	[+Regularity] Predicates	-	-
hinihini **SCALAR CHANGE**	-	Only with Explicit Scalar Change Predicates	-
hibi **DIVISIVE-PATH**	-	Only with Explicit Scalar Change Predicates	OK

(94) Korean

Korean	Repetitive Reading	Incremental Reading	Continuative Reading
tatali **BOUNDEDNESS**	OK	Only with Explicit Scalar Change Expressions	-
Nanali **SCALAR CHANGE**	-	Forcing Scalar Expressions to have a Comparative Operator	-
halwuhalwu **DIVISIVE-PATH**	-	Only with Explicit Scalar Change Expressions	OK

4 Pluractionality of Verbal Phrases

This chapter starts from verbal derivational suffixes on the morphological level and moves onto an auxiliary verb of verbal complex on the syntactic level.

First, we deal with verbal derivational suffixes -*keli*- and -*tay*-, which follow a root and form a verb of complex. We show the similarities and differences between -*keli*- and -*tay*- in various environments, represent semantic interpretation for each type, and evaluate their status with regard to pluractional semantics.

(1) a. Mina-ka nwun-ul [kkampak-**keli**]-ess-ta.
M.-NOM eye-ACC blinking-**VSFX**-PST-DECL
'Mina blinked her eye(s)'

b. Mina-ka [cwungel-**keli**]-ess-ta.
M.-NOM murmuring-**VSFX**-PST-DECL
'Mina murmured'

(2) a. Mina-ka nwun-ul [kkampak-**tay**]-ss-ta.
M.-NOM eye-ACC blinking-**VSFX**-PST-DECL
'Mina kept blinking her eye(s)'

b. Mina-ka [cwungel-**tay**]-ess-ta.
M.-NOM murmuring-**VSFX**-PST-DECL
'Mina kept murmuring'

Second, the verbal complex construction V-*e tayta* is introduced. Auxiliary verb *tayta* is different from the verbal derivational suffix -*tay*- in that it is attached to a main verb root with the conjunctive marker -*e*. This chapter will show the semantic

similarity as well as a resemblance between suffix *-tay* and the auxiliary verb *tayta* and present a unified semantic analysis.

(3) a. Mina-ka mom-ul huntul-e tay-ess-ta.
M.-NOM body-ACC shake-CONJ **REPETITIVE**-PST-DECL
'Mina shaked herself'

b. Mina-ka mom-ul wumciki-e tay-ess-ta.
M.-NOM body-ACC move-CONJ **REPETITIVE**-PST-DECL
'Mina moved herself repeatedly'

4.1 Verbal Derivational Suffixes *-keli-* / *-tay-* and Verbal Complex V-*e tayta*

4.1.1 Lexical Relations between *-keli-* and *-tay-*

Traditional views on Korean morphology consider these two suffixes as competing synonyms, based on the judgement that both of them express repetitive readings (cf. Choi 2004). This perspectives is reflected in *The Standard Korean Dictionary* [*Pyojun-Gugeo-Daesajeon*] (2015), which describes that lexical entries which are derived with the suffix *-keli-* have the ones derived with the suffix *-tay-*. It was described as follows; when there is a lexical entry where the suffix *-keli-* is attached to some root, *-tay-* may be attached to that same root. Moreover, the meanings of the two predicates are described as identical. For example, the lexical entry *huntul-tayta* has the meaning "[synonym] *huntul-kelita* (1. to sway from side to side again and again)."

However, this description focuses only on the fact that two suffixes are attached

to identical groups of roots, but overlooks the fact that two groups of derived verbs may differ from each other. There have been some studies that consider the two suffixes as having different meanings. The following studies focus on the semantic characteristic of -*keli*- and -*tay*- and distinguish between the two suffixes (Shin 1986, Park 1994, and Lee M-W 2005).

Shin (1986) describes -*keli*- and -*tay*- as follows: (i) these two suffixes turn a symbolic root into a dynamic expression, (ii) they denote that motions of their roots are continued more than two times, and (iii) the end point of sequenced motions is incomplete. Meanwhile, Shin draws a distinction between -*keli*- and -*tay*- in terms of derived meanings.

(4) Shin (1986)

a. ^{ok} -*keli*-, ^{ok} -*tay*-	
Continuous and Incomplete Motions	**Motion**: kiwus 'peeping', twichek 'tossing and turning', chwulleng 'slopping (water)', huntul 'shaking/swaying' **Sound**: ppiyak 'cheep (chick sound)', ululeng 'snarling sound', cwungel 'murmuring', khollok 'coughing sound' **Feeling**: wuksin 'throbing', ttakkum 'tingling', sikhun 'tingling', maykkun 'sleek / slippery', mallang 'soft / tender' **Shape**: kulsseng 'glistening (tears)', panccak 'flash / glitter / twinkle', ppicwuk 'pouting', huykkus 'grizzled'
b. * -*keli*-, * -*tay*-	
Non-identical motions	**Motion**: kalphang-cilphang 'flustered / confused ', tullak-nallak 'going in and out', hetwung-citwung 'hasty / hurry-scurry' **Sound**: ttak.ta.ku.lu.lu 'rumbling / rolling', co.lu.lu.lu

	'trickling / dribbling', wakcacikkel 'noisy / yackety-yack'
Complete motions	**Motion**: tomak 'piece / bit / fragment / block', tongkul 'round', ttolyes 'clear / bright / lucid' **Shape**: kotul 'hard and dry', nulssin 'slender / slim', mongttok 'stubby / stumpy'
States	**Motion**: nulis 'slow / sluggish' **Feeling**: mwusi 'terrible / horrible', asul 'critical / close / narrow', cikus 'tedious / tiresome' **Shape**: holi 'willowy / slender', ema 'immense / awesome', situl 'withered', chwulchwul 'a little hungry', khamkham 'pitch-dark'

Meanwhile, Park (1994) and Lee M-W (2005) describe that -*keli*- and -*tay*- take sets of roots different from each other. The range of roots to which -*keli*- can be attached is wider than the one of -*tay*-; there exist roots that -*keli*- can be attached but -*tay*- cannot. Park (1994) suggests that the roots for -*keli*- are 'repeatable motion' and 'momentary state' while the ones for -*tay*- are restricted to 'repeatable motion'. Similarly, Lee M-W (2005) argues that the roots of 'circular motion' are okay both with -*keli*- and with -*tay*-, while the ones of 'internal cognition' and 'cognition of external state' have different compositionality with -*keli*- and -*tay*- depending on their degree of semantic extension into 'circular motion'.

(5) Park (1994):

The Result of Acceptability Research on Composition of -*keli*- and -*tay*-

a. ^{ok} -*keli*-, ^{ok} -*tay*-

Repeatable motions	kkokicak ‘crumpling / wrinkling’, kkomcilak ‘wriggling’, kkwumwul ‘wriggling / lingering / dawdling’, kkwumthul ‘wriggling’, kkutek ‘nodding’, nemsil ‘swelling’, tempeng ‘splashing / clumsy’, pwukcek ‘crowded’, pithul ‘stumbling / staggering / tottering’, pisil ‘tottering’, cholssak ‘frivolous’
b. ok *-keli-*, * *-tay-*	
Momentary states	kiwus ‘peeping’, chwulleng ‘slopping (water)’, huntul ‘shaking/swaying’, nallum ‘handing one’s lip / swallowing’, tetum ‘groping / fumbling / stammering’, tulssek ‘moving up and down / heaving’, pangkkus ‘smiling’, omwul ‘chewing’, tallang ‘dangling’, taylong ‘dangling / hanging and swinging’ kamwul ‘flickering / muddled’, kulsseng ‘glistening (tears)’, panccak ‘flash / glitter / twinkle’, pantul ‘glistening / shining’, alun ‘glimmering / wavering / haunting’, ikul ‘blazing (fire) / glaring (eyes)’, ttakkum ‘tingling’, wulleng ‘palpitating / feeling nausea’, hwukkun ‘burning / flushing’, kkuncek ‘sticky / gluey’, humwul ‘mushy / flabby / limp’
c. * *-keli-*, * *-tay-*	
Motions that the **beginning** and **the end** are **not identical**	palkkun ‘with a burst of anger’, pelttek ‘springing up or falling down suddenly’, pwulsswuk ‘abruptly’
Continuous states	kwupwul ‘crooked’, kiwuttwung ‘tilting / wobbly’, kkokis ‘crumpled’, ttukkun ‘fairly hot’, mwungttwuk ‘stubby / stumpy’, mangsel ‘hesitating’, asul ‘critical / close / narrow’, otul ‘shivering’

(6) Lee M-W (2005)

a. ^{ok} *-keli-*, ^{ok} *-tay-*	
Words which are **Onomatopoeic** and **Mimetic** at the same time	kkilkkil 'giggling', ululeng 'snarling sound', khollok 'coughing sound', khwung-khwung 'thrump / pitapat'
Circular motions	phallang 'flapping / waving', phellek 'flapping / waving', huntul 'shaking/swaying', chwulleng 'slopping (water)', panccak 'flash / glitter / twinkle'
b. ^{ok} *-keli-*, * *-tay-*	
Internal cognitions	kancil 'tickling / ticklish', nukul 'heaving one's gorge / feeling queasy', hwukkun 'burning / flushing', wulleng 'palpitating / feeling nausea'
Cognitions of external states	mikkun 'sleek / slippery / greasy', kkuncek 'sticky / gluey', pantul 'glistening / shining', kkelttek 'panting / (informally) coming on to somebody'
c. * *-keli-*, * *-tay-*	
Non-circular motions	memchis 'hesitating / halting / boggling', pelttek 'springing up or falling down suddenly',
Pure Mimetic words	nolus 'yellowish', phalus 'green / verdant', ellwuk-tellwuk 'mottled / dappled / variegated', wulkus-pwulkus 'colorful / varicolored / parti-colored', kkong-kkong 'freezing hard / tightly (bound)', taylong-taylong 'dingle-dangle', molak-molak '(smoke or steam) rising up', wuttwuk 'towering / lofty', cwuleng-cwuleng '(boughs) heavily loaded (with fruits)'

Pure onomatopoeia	kkaykayng 'dog's yelping', kaykwul 'frog's croaking', ppiyak 'cheep (chick sound)'[15] khwung 'bump / thump', kkung 'grunting / groaning'[16]

Note that the studies mentioned above present not only different definition on -*keli*- and -*tay*-, but also different sets of roots from one another. They make different judgements on some roots even in terms of applicability of -*keli*- as well as -*tay*-.

[15] Lee M-W (2005) argues that the sound-emitting type of symbolic adverbs falls into two classes as (i) pure onomatopoeia and (ii) words which are onomatopoeic and mimetic at the same time, and that the latter can work as roots of -*keli*- and -*tay*- but the former cannot. However, his distinction between two classes is in doubt. He does not explain why lexical items imitating the sounds of dogs, frogs, and chicks (*kkaykayng* 'dog's yelping', *kaykwul* 'frog's croaking', *ppiyak* 'cheep (chick sound)') are classified into pure onomatopoeia while *ululeng* 'snarling sound' belongs to words which are onomatopoeic and mimetic. In the Sejong corpus, in fact, various sounds of animals are searched with -*keli*-, such as *kkokko*, *kkokkotayk* 'the sound of cackling (chicken's sound)', *kkwayk-kkwayk* 'quack-quack (duck's sound)', *kkwul-kkwul* 'oink (pig's sound)', and *kkilwuk* 'honk (the shriek of the seagulls)'. By consulting these usages, we suppose that the sounds that imitate dogs, frogs, and chicks are also possible. Onomatopoeia imitating animal sounds could evoke motions that an animal moves its mouth or beak to emit sound.

[16] One-syllabic onomatopoeia cannot combine with -*keli*- and -*tay*-. This is not because they do not evoke any motion, but because they are one-syllabic. For example, *kwung* 'bump / thump' in *mwulkenul kwung ttelettulita* 'to drop something with a thump' is not likely to refer to only a sound without evoking a motion that some object strikes the bottom. One-syllabic onomatopoeia has been explained by means of the phonological constraint that neither -*keli*- nor -*tay*- are attached to one-syllabic roots. Reduplicated forms of one-syllabic roots are naturally combined with -*keli*- nor -*tay*-. Based on this description, some approaches have tried to give a semantic account that the constraint on one-syllabic roots is due to its single-occurrence meaning, by semantically relating one-syllabic roots with one occurrence of motion, and those reduplicated forms with multiple occurrence of motion. However, many of the roots which are natural with -*keli*- and -*tay*- are unreduplicated and two-syllabic roots. The previous accounts expect that unreduplicated forms correspond to single-occurrence motions; then, referring to single-occurrence motion is not a decisive factor of incompatability. Thus, one-syllabic roots with -*keli*- and -*tay*- are phonologically constrained, not sematically.

Park (1994) takes a negative stand on the judgement that a composition of -*tay*- with a stative root is well-formed; he considers those cases only to be possibly induced by the effect of education but still to be ill-formed. On the other hand, Lee M-W (2005) argues that the compositionality of 'feeling'-type symbolic adverbs with -*keli*- and -*tay*- is determined by the degree of semantic extension from a stative meaning to a dynamic meaning. He defines the term 'internal cognition' as recognizing the state of experiencer as theme. When someone feels a change of state, awareness of change presupposes the existence of change, i.e. dynamicity. The cognition of external state has associations with motions accompanied on sense perception.

4.1.2 Category Shift from Auxiliary Verb to Verbal Affix

The relation between verbal derivational suffix -*tay*- and auxiliary verb *tayta* has been dealt with by the previous studies such as Kim (2003) and Lee H-H (2009). Lee H-H (2009:184-188) propose the category shift process of suffix -*tay*- as a sequence of '*tahta* (接 'to contact', 觸 'to touch', 着 'to reach')→ *tahita* ('to cause to touch')→ *tayta* (main verb; 'to cause to touch,' 'to cause to be adjacent,' or 'to be adjacent') → *tayta* (auxiliary verb; 'to repeat an action') → -*tay*-(*ta*) (suffix; repetition)', and analyze that the main verb *tayta* undergoes an abstraction of meaning on the stage of auxiliary verb and then shifts its category to suffix with maintaining the property of 'repetition'. Kim (2003) also analyzes a category shift from the main verb *tayta* to suffix -*tay*- by mean of abstraction of meaning: main verb *tayta* (with the meaning 'put/touch/supply/arrive in time/park') → auxiliary verb (repeated continuative aspect) → suffix (repeated continuation).

On the other hand, the verbal derivational suffix -*keli*-, which has been grouped with the suffix -*tay*-, has neither the corresponding free predicate nor complex predicate construction *V-*e kelita*.

(7) a. ttwi-e tayta 'keep jumping' , tally-e tayta 'keep running'
b. ttwi-e *kelita , tally-e *kelita

4.2 The Semantic Conditions on the Verbal Derivation with -*keli*- and -*tay*-

In this section, we propose that *keli*-type predicates and *tay*-type predicates impose identical semantic conditions on their roots but are semantically distinctive, by showing that they show different behaviors in the various semantic environments although their semantic conditions on roots are identical. Furthermore, we propose semantic representations based on their common semantic properties, and ultimately reestablish the relation between -*keli*- and -*tay*-.

4.2.1 The REPEATABILITY Condition of -*keli*- and -*tay*-

What the previous studies have proposed in common is that verbal affixes -*keli*- and -*tay*- compose only with the meaning of *circular motion*[17] among the symbolic roots, which have been roughly classified as onomatopoeic or mimetic words. If some motion occurs and the same type of motion is able to follow immediately,

[17] The terms 'continuous and incomplete motions' (Shin 1986), 'repeatable motion' (Park 1994), and 'circular motion' (Lee M-W 2005) have been suggested to capture the semantic condition of -*keli*- and -*tay*-.

then this motion is *circular*.

(8) ***Circular Motion***:

A motion occurs and then the same type of motion is able to follow immediately.

Symbolic roots are classified in terms of the compositionality with -*keli*- and -*tay*- as follows:

(9) Type (I) + ^{ok} -*keli*- / ^{ok} -*tay*-

a. **Visual sensation**

(i) Reciprocating motion: kiwuttwung 'tilting / wobbly', kkokicak 'crumpling / wrinkling', kkomcilak 'wriggling', kkutek 'nodding', tallang 'dangling', taylong 'dangling / hanging and swinging', pangkkus 'smiling', pithul 'stumbling / staggering / tottering', ppicwuk 'pouting', omwul 'chewing', phatak 'flaping' / kkwumthul 'wriggling', nemsil$_{[i-(1)]}$[18] 'swelling', twichek$_{[1]}$ 'tossing and turning', tulssek$_{[1]}$ 'moving up and down / heaving', memchis$_{[1]}$ 'halting', wulleng$_{[ii-(1,2)]}$ '(floor's) waving / moving', chwulleng$_{[i-(1)]}$ 'slopping (water)', huntul$_{[1]}$ 'shaking / swaying', hwuycheng$_{[i-(1)]}$ 'staggering / tottering'

(ii) Rotary motion: teykwul 'rolling'

(iii) Light emission (I) – intermittent flicking: panccak 'flash / glitter / twinkle', penttuk 'spark', kkampak 'flicker / blink'

b. **Auditory sensation**

(i) Sound emission (I): chelssek 'lapping', kkokkotayk 'cluck/cackle', kkwayk-kkwayk 'quack-quack (duck's sound)', ttokttak 'tictac', ululeng

[18] The subscribed number is brought from the number which *The Standard Korean Dictionary* (2015) presents in order to distinguish more than one meanings which belonged to one lexical entries.

'with a growl', khollok 'cough', khwung-khwung 'thrump'

Roots in (9) include physical motions corresponding to reciprocating motions and rotary motions, light emissions and sound emissions. These types have been exemplified as combinable with -*keli*- throughout the previous studies. The usages of these types with -*keli*- are identified from Sejong corpus. As for -*tay*-, most of studies have also accepted their combinations with the types of roots in (9).

(10) a. pyelpich-i panccak-**keli**-ess-ta.
starlight-NOM twinkling-**KELI**-PST-DECL
'A star twinkled'

b. pyelpich-i panccak-**tay**-ss-ta.
starlight-NOM twinkling-**TAY**-PST-DECL
'A star twinkled'

Meanwhile, it is not natural to compose the roots in (11)-(13) with -*keli*- or -*tay*-. This is because thoses in (13) have a stative meaning and the ones in (11) and (12) have a non-circular meaning. Park (1994) also points out that neither 'motions that the end is different from the beginning' (as in (11)) nor 'continuous state' (as in (13)) can be a root for -*keli*- or -*tay*-. Roots in (12) denote a motion to move on in a certain direction. What is important in (12) is that a theme keeps changing its location along some path and the end is not captured.

(11) Type (II) + *-*keli*- / *-*tay*-
palkkun 'with a burst of anger', pelttek 'springing up or falling down suddenly', pwulsswuk 'abruptly', cilkkun 'tightly'

(12) Type (III) + *-*keli*- / *-*tay*-

a. Motion: phal-phal 'boiling / seething', phel-phel 'phal-phal 'boiling / seething / (rain, snow, or power) falling in flakes', hwel-hwel 'flying high and freely with flapping'

b. Sound emission (II) – directed motion: ssing-ssing '(wind) blowing fast / (vehicle) flashing by', ssayng-ssayng '(wind) blowing fast / (vehicle) flashing by', ttak.ta.ku.lu.lu 'rumbling over / rolling over and over', co.lu.lu '(liquid) trickling / dribbling / (child) running or following with small and fast steps', teykwulwulwu 'rolling over and over'

(13) Type (IV) + *-*keli*- / *-*tay*-

a. Shape: kkong-kkong 'freezing hard / tightly (bound)', mwungttwuk 'stubby / stumpy', wuttwuk 'towering / lofty', posong 'soft and dry / fluffy'

c. Taste: talkhom 'sweet (taste)' saykhom 'sour (taste)'

d. Smell: pilis 'somewhat fishy / smelling a little bloody'

e. Abstract property: alssong-talssong 'puzzling / bewildering'

These 'change-of-states' in (11), 'directed movements' in (12), and 'states' in (13) are characterized in terms of the following properties when they are compared to (9): dynamicity, cumulativity, and divisivity. Circular motions are dynamic, cumulative, and non-divisive. Motions are dymanic. Circluarity is non-divisive in the same way that a part of circle is not a circle, and also cumulative in that it always goes back to the starting point and gets ready to restart.

'Change-of-states' in (11) are different from (9) in terms of culumativity, as in (14b). 'Directed movements' in (12) differ in divisivity, as in (14c). 'States' in (13) differ in both dynamicity and divisivity.

(14) a. [**+dynamic**, **+cumulative**, **−divisive**, …] + *-keli-* / *-tay-* = (9)

b. [+dynamic, <u>−cumulative</u>, −divisive, …] + **-keli-* / **-tay-* = (11)

c. [+dynamic, +cumulative, <u>+divisive</u>, …] + **-keli-* / **-tay-* = (12)

d. [<u>−dynamic</u>, +cumulative, <u>+divisive</u>, …] + **-keli-* / **-tay-* = (13)

Then, the question is whether the properties of dynamicity and divisivity work redundantly here. We provide a negative answer for this; furthermore, we argue that the dynamicity is not a relevant property for determining the domain of *-keli-* and *-tay-*, but the divisivity is.

Other types of roots in (15) have also been exemplified as combinable with *-keli-* and *-tay-* even though some of these types have been described as having less dynamicity than the roots in (9) by the previous studies. As for *-tay-*, most studies have not agreed on its combination with many of the roots in (15) and have ascribed this uncombinablity to insufficient dynamicity of roots. However, every study presents different lists of roots which have been pointed out as uncombinable. In regard to this matter, we focus on the productivity of *-tay-* and deal with the combinability of *-tay-* with a root in terms of interpretability of derived predicates. In this way, all of the roots in (15) as compatible with *-tay-*, based on examples such as (16).

(15) Type (V) + ^{ok} *-keli-* / ^{ok} *-tay-*

a. **Visual sensation**

(i) Conplex motion: kiwus ‘peeping’, kkelttek ‘panting / (informally) coming on to somebody’, kkwumwul ‘lingering / dawdling’, tetum ‘groping / fumbling / stammering’, tempeng ‘splashing / clumsy’, tullak ‘coming in and out / going in and out’, tulssek$_{[3]}$ ‘feeling restless / bing in

a flutter', pisil 'tottering', salsal 'charming people with a honeyed smile', singkul-pengkul 'being all smiles / grinning', otul 'trembling / quivering / shivering', wuccwul 'acting conceited / admiring oneself', ccalccal 'going around hurriedly', cholssak 'frivolous', hwutul 'trembling / quivering / shivering'

(ii) Group motion: tuksil 'swarming', pakul 'teeming', wukul 'crawling with somebody/something', pwukcek 'crowded', chwulleng$_{[i-(2)]}$ 'crowded'

(iii) Abstract motion: memwus 'hesitating', memchis$_{[2]}$ 'hesitating / halting / boggling', chwulleng$_{[ii]}$ 'slopping (water)', huntul$_{[2]}$ 'shaking/swaying', hwuycheng$_{[i-(2), ii]}$ 'faltering / reeling (in crisis)'

(iv) Light emission (II) – scattering and reflection: kamwul 'flickering / muddled', kulsseng 'glistening (tears)', pantul 'glistening / shining', alun 'glimmering / wavering / haunting', elun 'glimmering / wavering / haunting', ikul 'blazing (fire) / glaring (eyes)', huykkus 'grizzled'

(v) Uneven shape: kkopwul 'winding / zigzag', ccwukul 'crumpled / wrinkled'

b. **Auditory sensation**

(i) Sound emission (III) – unclear and unrefined speech: napwul 'chattering / wagging one's tongue', cwungel 'murmuring', kwungsileng 'naggrumbling', thwutel 'grumbling', pianyang 'making sarcastic remarks', sisitek 'chating and giggling', hihitek 'chating and giggling'

(ii) Sound emission (IV) – clamor of multitude: tulssek$_{[4]}$, sikkul-pekcek 'noisy and crowd / boisterous / yackety-yack'

c. **Skin sensation**

(i) Touch sensation: kkuncek 'sticky / gluey', mallang 'soft / tender', maykkun 'sleek / slippery', mikkun 'sleek / slippery / greasy', sakak 'crunching / being crisp to the teeth / rustling', cilphek 'wet and soft /

muddy', humwul 'mushy / flabby / limp'

(ii) Pain sensation: kancil 'tickling / ticklish', nukul 'heaving one's gorge / feeling queasy', ttakkum 'tingling', sikhun 'tingling', wuksin 'throbing', wulleng$_{[i\text{-}(1,2)]}$ 'palpitating / feeling nausea'

(iii) Temperature sensation: hwakkun 'burning / flushing', hwukkun 'burning / flushing'

(16) a. hwacangsil thail-i pantul-**tay**-tolok kkaykkusi takk-ala.
restroom tile-NOM shining-**V.SUFFIX**-CONJ clean wipe-IMPER
'Wipe the tiles of restroom clean in order to shine'

b. Son-ey pinwu-ka mwut-e maykkun-**tay**-ess-ta.
hand-LOC soap-NOM smear-CONJ smoothing-**V.SUFFIX**-PST-DECL
'The soap got on one's hands, so that it feels slippery'

c. Yelki-lo hwukkun-**tay**-nun maksa an-ey, …
heat-INSTR burning-**V.SUFFIX**-ADNOMINAL barrack inside-LOC
'In the barrack burning with heat'

Type (V) includes not only roots which evoke (physical) motions, light emissions and sound emissions, but also roots which refer to skin sensations – touch, pain, and temperature sensations. Then, how can roots with skin sensation meanings belong to the same class as other roots which are identified as dynamic activities in (15)? We might assume that these types of roots in Korean have the characteristics to imply a cognitive activity to observe or reason motions by means of visual, auditory, and skin sense.

Then, can we confirm that the semantic condition of *-keli-* and *-tay-* is defined as a circular motion? The concept of 'circular motion' is not appropriate to define a semantic class of roots which is in combination with *-keli-* and *-tay-*. Events which

are circular motions are only the proper part of the semantic class of root which -*keli*- and -*tay*- are attached to. For example, the motions denoted by roots in (15a-(ii)) are not necessarily circular, and the roots in (15a-(v)) do not even seem to evoke any motion. Also, a circular motion is not a sufficient condition, either. In fact, some roots – such as *ttaktakululu* 'rumbling over / rolling over and over' and *teykwulwulwu* 'rolling over and over' in (12) – cannot combine with -*keli*- and -*tay*- even though they refer to an event that consists of circular motions. Then, we need a more precise description on the semantic condition of -*keli*- and -*tay*-.

As we set dynamicity aside by introducing (15) into the picture, we can identify a well-defined class which is cumulative and non-divisive.

(17) a. [+dynamic, **+cumulative**, **−divisive**, …] + -*keli*- / -*tay*- = (9)

b. [±dynamic, **+cumulative**, **−divisive**, …] + -*keli*- / -*tay*- = (15)

c. [+dynamic, <u>−cumulative</u>, −divisive, …] + *-*keli*- / *-*tay*- = (11)

d. [+dynamic, +cumulative, <u>+divisive</u>, …] + *-*keli*- / *-*tay*- = (12)

e. [−dynamic, +cumulative, <u>+divisive</u>, …] + *-*keli*- / *-*tay*- = (13)

Verbal affixes -*keli*- and -*tay*- have the same semantic condition: to be cumulative and non-divisive. Each of roots for -*keli*- and -*tay*- refers to a unique pattern. It is these patterns that are cumulative and non-divisive, which is associated with the characteristic of repeatablility. Park (1994) defines the condition on roots for -*keli*- and -*tay*- as 'repeatable motions', as shown in (5). We extend this observation to repeatability to capture the stative meaning of 'repeatale patterns' in (15a-(v)). Repeatability indicates a case that something is ready to restart when and where it ends. Also, repeatability can indicate a case that some patterns are observed in many places at the same time, such as *to creat a* ***repeating***

floral ***pattern*** *that's perfect for gift wrapping*. When a repetition occurs, there is more than one start point. These start points could be *restart* points, which are temporally sequenced, or could be *multiple* start points, which are spatially distributed. It is the cumulative and non-divisive nature that results in having more than one start point.

(18) [Condition IV-1] REPEATABILITY: there is a cumulative and non-divisive pattern.

4.2.2 *KELI*-type Predicates: Some as Semelfactives and Others as Non-atomic Activities

Before setting out to define the function of -*keli*-, let us return to 'circular motions'. This type of motion corresponds with an aspectual characteristics of *semelfactives*. According to Rothstein (2008), semelfactive predicates, such as *kick*, *knock*, *jump*, *skip*, *flap* (*its wings*), *wink* in English), denote single short actions that can be repeated immediately. They typically involve a movement that ends in the same position that it started. These events do not have a complex internal structure and this kind of single action is inherently individuated by virtue of the predicates being naturally atomic. As for Rothstein's (2008) *natural atomicity*, what counts as one kick or hit is lexically specified without depending on the verbs' arguments, context or anything else (Součková 2011). In particular, a semelfactive predicate denotes a unit event which is recognized along the 'trajectory' by which a certain type of event (or action) is defined.

Roots in (9) are defined as naturally atomic, which refers to a unit event recognized by means of a lexically specified 'trajectory'. On the other hand, the

roots in (15) is defined as non-atomic, which means that observing or reasoning their motion is possible by recognizing it through visual, auditory, and skin sensation, but to define a representative 'trajectory' is impossible due to a complex internal structure – in other words, due to a heterogeneous inner structure.

(19) a. [+dynamic, +cumulative, −divisive, **+natural-atomic**] + *-keli-* / *-tay-* = (9)

b. [±dynamic, +cumulative, −divisive, **− natural-atomic**] + *-keli-* / *-tay-* = (15)

There are some examples which directly show this heterogeneous property of inner structure. The examples in (20) and (21) are found through a search for *-keli-* from Sejong corpus. Partially reduplicated forms AA′B or AB′B in (20a-(i)) show a natural combinability with *-keli-*, but partial reduplications in the form of ABA′B and total reduplications ABAB have been reported to be unnatural. However, unlike such descriptions in the previous studies, the examples of ABA′B and ABAB are also observed as in (20a-(i)) and (20b). Moreover, even examples of roots in (21) are observed against Shin's (1986) description in (4) that non-identical motions are uncombinable with *-keli-*, as in (22).

(20) Reduplicated roots with *-keli-* (Sejong corpus)

a. Partial reduplication:

(i) nulicek (nulis 'slow'), telketek (telkek 'clattering / rattling'), telkulek (telkek 'clattering / rattling'), telkheteng (telkheng 'clattering / rattling'), tuksikul (tuksil 'swarming'), ppiketek (ppikek 'creaking'), wumcilek (wumcik 'budging / moving slightly'), ututuk (utuk 'crunching'), ikicwuk (icwuk 'making invidious remarks'), cilphetek (cilphek 'slobby'), chikuntek (chikun '(head) throbbing with pain'), khitutuk (khituk 'giggling / sniggering'), thwutwutwuk (thwuk 'thud'), phelletek (phellek

'flapping'), hanucak (hanul 'swaying weakly/ fluttering weakly'), hunucek (hunul 'swaying flabbily / fluttering flabbily')

(ii) wukcek-pwukcek (pwukcek 'crowded')

b. Total reduplication

kyawus-kyawus (kyawus 'tilting one's head sideways'), kkutek-kkutek (kkutek 'nodding'), napwul-napwul (napwul 'chattering / wagging one's tongue'), nulis-nulis (nulis 'slow'), numsil-numsil (numsil 'swelling / looking over with coveting something'), memwus-memwus (memwus 'hesitating'), panccak-panccak (panccak 'flash / glitter / twinkle'), sayngkul-sayngkul (sayngkul 'smiling'), sekek (sekek 'crunching / being crisp to the teeth / rustling'), swukwun-swukwun (swukwun 'talking in whispers'), elun-elun (elun 'glimmering / wavering / haunting'), ululeng-ululeng (ululeng 'with a growl'), cwungel-cwungel (cwungel 'murmuring'), cilpek-cilpek (cilpek 'wet and soft / muddy'), ccwungel-ccwungel (ccwungel 'murmuring'), khwungtak (khwungtak 'pounding'), khwungtek- khwungtek (khwungtek 'pounding')

(21) Compound roots with -*keli*- (Sejong corpus)

a. tul-nallak 'going in and out', tullak-nallak 'going in and out'

b. sikkul-pekcek 'noisy and crowd / boisterous / yackety-yack', ppencil-tullak 'going in and out very frequently, ulu-ttakttak 'threatening and snapping'

(22) a. kyengchalkwan-i tulese-ca,
police.officer-NOM enter-when
<u>sikkulpekcek-keli</u>-ten salam-tul-i ilswun coyonghaycy-ess-ta.
noisy.crowded-KELI-ADN person-pl-NOM in.a.moment fell.silent-PST-DECL
'When (a/the) police officer entered, the noisy and crowded people fell silent'

b. cipan-ey canchi-ka peleci-l ttay-nun matang an-i

home-LOC party-NOM be.held-ADN time-TOP yard inside-NOM
salamtul-lo katuk cha-a **sikkulpekcek-tay**-ess-ta.
people-INST fully be.filled-CONJ noisy.crowded-TAY-PST-DECL
'When a party is held in the house, the yard full of people is noisy and crowded'

4.2.2.1 *KELI*-type Predicates (I): Semelfactives

When -*keli*- is attached to naturally atomic roots in (9), their derived predicates are identified as semelfactives.

(23) kiwuttwung-kelita 'tilt / wobble'
kkokicak-kelita 'crumple / wrinkle'
kkutek-kelita 'nod'

The term *semelfactive* originates from the Latin *semel* (once), which is used in Slavic linguistics for a suffix which indicates a single event, and means once or one time (Smith 1991). Thus, semelfactives are able to refer to a single action. This characteristics of semelfactive predicates are tested with a temporal phrase which means 'one time', as in (24). Basically, cardinal count adverbials could be used with reference either to the event itself (events themselves) or to the occasion(s) (Mourelatos 1978:426). Here, it is important that a single motion of *kkokicak-kelita* 'do crumpling' is captured by *han pen* 'once' in (24-(i)).

(24) Mina-ka congi-lul **han pen** kkokicak-keli-ca,
M.-NOM paper-ACC **one time** crumpling-KELI-soon.after,

aki-ka wus-ess-ta.

baby-NOM laugh-PST-DECL

'Soon after Mina crumpled the paper once, the baby laughed.'

(i) ok [crumpling] – [laughing] (a **SINGLE MOTION** in one occasion)

(ii) ok [crumpling crumpling crumpling] – [laughing]

(multiple motions **in ONE OCCASION**)

Then, how can repeated readings be derived from the semelfactives, which basically refers to single actions? Besides, Smith (1991) states that (i) semelfactives do not accept the imperfective viewpoint and (ii) semelfactives are incompatible with forms associated with duration or completion.[19] Here, Smith (1991) uses the terms 'semelfactives' to refer to a single action ('occurring once'). As shown through (25)-(26), semelfactives have only a repeated reading in the construction of progressive -*ko iss*- (25) or with a durative adverbial (26).

(25) Mina-ka congi-lul kkokicak-**keli**-**ko iss**-ta.

M.-NOM paper-ACC crumbling-KELI-CONJ PROG-DECL

(i) # 'Mina is in the progress of crumbling' ('occurring once')

(ii) ok 'Mina keep crumbling the paper over and over'

('occurring repeatedly')

(26) a. Mina-ka **o-pwun tongan** meli-lul kkutek-**keli**-ess-ta.

M.-NOM five-minute for head-ACC nodding-KELI-PST-DECL

[19] Smith (1991: 181) suggests the syntactic properties of semelfactives as follows:

a. Semelfactives have dynamic syntax.
b. Semelfactives do not accept the imperfective viewpoint.
c. Semelfactives are incompatible with forms associated with duration or completion.
d. Semelfactives have the habitual stative interpretation in Present perfective sentences.

(i) # 'Mina did just one head-nodding motion for 5 minutes'
('occurring once')

(ii) ok 'Mina keep nodding her head over and over again for 5 minutes'
('occurring repeatedly')

b. Mina-ka **o-pwun maney** meli-lul kkutek-**keli**-ess-ta.
M.-NOM five-minute in head-ACC nodding-KELI-PST-DECL

(i) # 'It took 5 minutes for Mina to start one head-nodding motion and end it'
('occurring once')

(ii) # 'It took 5 minutes for Mina to start multiple head-nodding motions and end it' ('occurring repeatedly')

(iii) ok '(From a certain time point,) it took 5 minutes for Mina to begin to nod'
('occurring once' / 'occurring repeatedly')

Rothstein (2008) distinguishes semelfactive predicates, such as *jump*, from the canonical activity ones, such as *run*, based on the follwong charactristics: 1) semelfactive predicates are ambiguous between a semelfactive reading ('occurring once') and a 'derived' activity ('occurring repeatedly') and 2) a so-called 'derived' activity reading of 'occurring repeatedly' results from applying 'S-summation' to a single action corresponding to 'occurring once' (Rothstein 2008).

Also, Yu (2003) uses the terms *non-pluractionals* for semelfactives with a semelfactive reading in order to emphasize its 'occurring once' meaning as the opposing term to pluractional. In this context, we can consider semelfactives with the other reading 'occurring repeatedly' as pluractional.

In this regard, once they are identified as semelfactives, *KELI*-predicates have a repeated reading as well as a single action meaning. These repeated readings are defined as event-external pluractionality, in that the number of subevents are

countable. Tovena (2010) also analyzes semelfactives as countable, and contrasts this with event-internal pluractionals.

(27) a. Mina-ka congi-lul **sey pen-ccay** kkokicak-keli-l ttay,
M.-NOM paper-ACC **three time-th/rank** crumpling-KELI-ADN when,
aki-ka wus-ess-ta.
baby-NOM laugh-PST-DECL

'In the third time when Mina did crumpling the paper, the baby laughed.'

(i) ok [crumpling crumpling **crumpling**] – [laughing]
(multiple motions in one occasion)

(ii) ok [crumpling] – [crumpling] – **[crumpling]** – [laughing]
(multiple occasions with a single motion)

(iii)ok [crumpling crumpling] – [crumpling crumpling] – **[crumpling crumpling]** – [laughing] (multiple occasions with multiple motions)

Countability shows itself more obviously when the objects are immediately adjacent to one another. In other words, even if events are not separate several occasions (e.g. they are not temporally apart from one another with breaks), they are countable. This is because each of them is individuated. In (28), there is no break to separate time intervals. Then, *twu pen* 'twice' indicates the number of crumpling motions, rather than the number of occasion. In other words, *kkokicak-keli-ta* 'to crumple the paper' denotes individuated events; therefore, these events are counted by the measure adverb *twu pen* 'twice' even though they are not temporally apart from one another with breaks.

(28) [Scenario: Mina crumpled the paper from 21:01:01 to 21:01:03,
and Mina crumpled the paper from 21:01:03 to 21:01:05.]

ok Mina-ka congi-lul **twu pen** kkokicak-keli-ess-ta.
M.-NOM paper-ACC **two time** crumpling-KELI-PST-DECL
'Mina did crumpling the paper twice'

4.2.2.2 *KELI*-type Predicates (II): Non-atomic Activities

When -*keli*- is attached to non-atomic roots as in (15), their derived predicates are identified as event-internal pluractionals.

(29) kiwus-kelita 'peep'
kkwumwul-kelita 'linger / dawdle'
cholssak-kelita 'move frivolously'
hwutul-kelita 'tremble / quiver / shiver'

A 'derived' activity ('occurring repeatedly') of semelfactives is an event-external pluractional which consists of naturally atomic events, as shown above; wheares, a non-atomic activity itself is associated with an event-internal pluractional which consists of phases. Tovena (2010) points out that Lasersohn (1995) indiscriminatingly presents the semelfactive verb *nibble* as an example of event-internal pluractional ('*phase repetition'* in Lasersohn (1995)), and argues that event-internal pluractionals should be distinguished from semelfactives in that the formers are uncountable, but the latters are countable. She also mentions that phases do not have the same property of event type as plurality which consists of themselves.

While *keli*-predicates with naturally countable atomic roots such as (9) whether

they indicate a single action or a repeated action, *keli*-predicates can be combined with uncountable non-atomic roots such as (15). The latters, as event-interval pluractionals, are not interpreted with a meaning specifying the number of pluralized subevents (or phase) even when they are modified by cardinal count adverbials – *han pen* 'once', *sey pen* 'three times', and so on. Cardinal count adverbials with event-internal pluractionals only indicates the number of events or occasions where a sequence of phases are continued.

(30) [Scenario: Mina dawdled from 21:01:01 to 21:01:03,
and Mina dawdled from 21:01:03 to 21:01:05.]

\# Mina-ka **twu pen** kkwumwul-keli-ess-ta.
M.-NOM **two time** dawdling-KELI-PST-DECL
'Mina dawdled twice'

(31) pey-e mwu-n ceylli-ka
cut-CONJ bite-ADN jellybean-NOM
(***han pen/*twu pen**) mallang-keli-ca, aki-ka wus-ess-ta.
{one time/**two time**} soft-KELI-soon.after, baby-NOM laugh-PST-DECL
'Soon after the jellybean felt soft in the mouth, the baby laughed'

The main criterion to distinguish two types of *keli*-predicates is the existence of a physical trajectory which is recognized as a consistent unit. If an event denoted by the -*keli*- predicate has a trajectory adequate to form a unit, then the type of event corresponds to semelfactives. Here, the trajectory works as a measure, which enables the unit of the event to be counted. Otherwise, if an event denoted by -*keli*- predicate has no trajectory or if the trajectory is inadequate to form a unit, then the type of event corresponds to a non-atomic activity. In this case, there is no

trajectory that functions as a measure. Therefore, these kinds of non-atomic activities have uncountable parts. Furthermore, whether a derived predicate with -*keli*- become a semelfactive or a non-atomic activity depends not on the form of lexical items but on its meaning. When a root is polysemous and it has different meanings in terms of atomicity, the -*keli*-predicate derived from that root is either a semelfactive or a non-atomic activity depending on the atomicity of each meaning. In (32), for example, *keli*-predicates are interpreted with concrete physical motions of physical objects, so that they are semelfactives. In contrast, *keli*-predicates in (33) – as a mental event or as a grouping event – have no consistent physical trajectory, even though they have with the same roots as (32). The variability between countability and uncountability from some lexical entries is ascribed to polysemic meanings.

(32) a. cilengi-ka kkwumthul-**keli**-ess-ta.
earthworm-NOM wriggling-KELI-PST-DECL
'{The/An} earthworm wriggled'

b. naympi ttwukkeng-i tulssek-**keli**-ess-ta.
pot lid-NOM moving.up.and.down-KELI-PST-DECL
'The pot-lid moved up and down'

(33) a. kasumsok-ey yokmang-i kkwumthul-**keli**-ess-ta.
one's.heart-LOC desire-NOM wriggling-KELI-PST-DECL
'A desire arose in one's heart' (lit. 'A desire wriggled in one's heart')

b. kyosil cenchey-ka tulssek-**keli**-ess-ta.
classroom whole-NOM moving.up.and.down-KELI-PST-DECL
'The classroom was restless' (lit. 'The classroom moved up and down')

4.2.3 *TAY*-type Predicates as Event-internal Pluractionals

As for -*tay*-, derived predicates are identified as event-internal pluractionals with both atomic roots, as in (9), and non-atomic roots, as in (15).

(34) kiwuttwung-tayta 'keep tilting / keep wobbling'
kkokicak-tayta 'keep crumpling / keep wrinkling'
kkutek-tayta 'keep nodding'

(35) kiwus-tayta 'keep peeping'
kkwumwul-tayta 'keep lingering / keep dawdling'
cholssak-tayta 'keep moving frivolously'
hwutul-tayta 'keep trembling / keep quivering / keep shivering'

Unlike *keli*-predicates, *tay*-predicates are uncountable even with naturally atomic roots. A single motion in (36-(i)) is difficult to be not captured from *kkokicak-tayta* 'keep crumpling' even in the modification of *ttak han pen* 'just once'. Here, it is only a single occasion that *han pen* indicates in the sentence with a *tay*-predicate.

(36) Mina-ka congi-lul **<u>ttak han pen</u>** kkokicak-**tay**-ca,
M.-NOM paper-ACC **just one time** crumpling-TAY-soon.after,
aki-ka wus-ess-ta.
baby-NOM laugh-PST-DECL
'Soon after Mina kept crumpling the paper once, the baby laughed.'
(i) # [crumpling] – [laughing] (a **<u>SINGLE MOTION</u>** in one occasion)
(ii) ok [crumpling crumpling crumpling] – [laughing]
(multiple motions **<u>in ONE OCCASION</u>**)

In reference to *han pen*, one might give a simple account that *tay*-predicates do

not denote a single action due to its plurality. However, this is not all about *tay*-predicates.

As more fundamental characteristics, pluractionality of *tay*-predicates indicates phases – subparts consisting an event in one occasion –, which are uncountable.

(37) a. Mina-ka congi-lul **sey pen-ccay** kkokicak-**tay**-l ttay,
M.-NOM paper-ACC **three time-th/rank** crumpling-TAY-ADN when,
aki-ka wus-ess-ta.
baby-NOM laugh-PST-DECL
'In the third time when Mina did crumpling the paper, the baby laughed.'
(i) # [crumpling crumpling **crumpling**] – [laughing]
(multiple motions in one occasion)
(ii) # [crumpling] – [crumpling] – **[crumpling]** – [laughing]
(multiple occasions with a single motion)
(iii)[ok] [crumpling crumpling] – [crumpling crumpling] – **[crumpling crumpling]** – [laughing] (multiple occasions with multiple motions)

(38) [Scenario: Mina dawdled from 21:01:01 to 21:01:03,
and Mina dawdled from 21:01:03 to 21:01:05.]
Mina-ka **twu pen** kkwumwul-**tay**-ess-ta.
M.-NOM **two time** dawdling-TAY-PST-DECL
'Mina dawdled twice'

(39) pey-e mwu-n ceylli-ka
cut-CONJ bite-ADN jellybean-NOM
(*han pen/*twu pen) mallang-**tay**-ca, aki-ka wus-ess-ta.
(one time/two time) soft-TAY-soon.after, baby-NOM laugh-PST-DECL
'Soon after the jellybean feels soft in the mouth, the baby laughed'

Thus, *tay*-predicates always derive the event internal-pluractionality. The preference of -*tay*- to the roots of non-atomic activity is associated with event internal-pluractionality.

(40) 33 Roots which are found with -*tay*- from Sejong corpus

a. Naturally atomic

(i) phellek 'flapping / waving'

b. Non-atomic

(i) **Conplex motion**: kelchitek 'getting in the way', kkicek 'scribbling'. Petwung 'squirming', pelleng 'throbbing / thumping / palpitating', cwumwullek 'hand-rubbing / kneading', hanul 'swaying weakly/ fluttering weakly', hwutul 'trembling / quivering / shivering'

(ii) **Abstract motion**: pwulttwuk 'with a rude burst of anger', usu 'bragging / boasting / showing off', cipcek 'meddling / needling / provoking', hetwung 'floundering', hewucek 'floundering', hungcheng 'having a binge'

(iii) **Light emission – scattering and reflection**: elun 'glimmering / wavering / haunting', huypenttuk 'glinting (eyes) / googling one's eyes', hwipentuk 'glinting (eyes) / googling one's eyes',

(iv) **Sound emission**: kkalkkal 'laughing loud/guffaw', kkilkkil 'giggling', kking-kking 'groaning and groaning', pwululung '(car) roaring', thwung-thwung 'thumping', hehe 'ha-ha / with a laugh', hunghung 'humming'

(v) **Sound emission – unclear and unrefined speech**: napwul 'chattering / wagging one's tongue', cwucel 'babbling / rattling on', cwungel 'murmuring', thwutel 'grumbling', ssikun 'paning / wheezing', sokon 'whispering', hungel 'humming'

(vi) **Sound emission – clamor of multitude**: pepsek 'fuss', swusen 'fuss'

4.2.4 The Semantic Interpretations of *-keli-* and *-tay-*

In spite of providing an identical semantic condition for both *-keli-* and *-tay-*, Shin (1986) draws a distinction between *-keli-* and *-tay-* in terms of derived meanings. She proposes that *-tay-* refers to *more* dynamic (or active) motion than *-keli-* does and that this is because the latter denotes a sequence consisting of motions where neither the starting point nor the end point are recognized, while the former denotes a sequence consisting of motions that only the end point is unrecognized.

Shin (1986) claims that the semantic function of *-keli-* and *-tay-* is to turn symbolic meanings to a series of motions, and, at the same time, that a role of *-tay-* is to recognize a sequence of motions in which the intensity increases as time goes by, rather than a repetition of identical motions. According her analysis, *keli*-predicates and *tay*-predicates seem to correspond to an iterative aspect and a gradual aspect respectively. She defines the whole sequence of repeated motions as incompletive Aktionsart, which corresponds to the characteristics of imperfect aspects such as frequentative aspects, continuative aspects, and gradual aspects.

On the other hand, Park (1994) argues that the aspectual characteristics of *keli*-predicates depends on dynamicity of roots. If the meaning of root is dynamic, then its predicate derived with *-keli-* is also dynamic and have a repeated reading. With a (momentary) stative root, the *keli*-predicate is also stative. In contrast, *-tay-* is described as combining only with repeatable motions and then deriving only a repeated reading. Also, in comparison with *-keli-*, it is mentioned that *-tay-* indicates the negativity or the intensified degree of motion.

Lee M-W (2005) proposes that *keli*-predicates have either iterative aspects or

continuative aspects, depending on the roots. *keli*-predicates with roots *mikkun* 'slippery' or *kkuncek* 'sticky' correspond to continuative aspects. *keli*-predicates are considered as iterative aspects only when they combine with symbolic adverbs which represent a 'circular meaning phase'; wheares, -*tay*- is considered to have iterativity as a lexical meaning.

The previous studies define a repetition as the basic meaning of -*keli*- and -*tay*- in common. However, their observations have been restricted to the temporal domain because -*keli*- and -*tay*- have been dealt with just as aspectual phenomena. Actually, we can observe some examples that are difficult to define as either an iterative aspect or a continuous aspect.

In (41), one distinguishes a spatio-temporal trajectory of a participant as a unit from the whole group of participants which occupies the whole space. Participants are required to be plural, to be scattered over the given space, and not to be still.

(41) a. konghang-i yehayngkayk-ulo **pwukcek-tay**-ess-ta.
airport-NOM tourist-INST crowded-TAY-PST-DECL
'The airport was crowded with tourists'

In (42), one distinguishes a winding pattern of a part as a unit distinct from the whole shape, whose line or surface is uneven, and then applies pluralization to that unit.

(42) a. sankil kolmok-un mwuchekina cop-ko
mountain.path alley-TOP very narrow-and
kkopwul-keli-ess-ta.
winding-KELI-PST-DECL
'The alley in the hill was very narrow and in zigzags'

b. kkepcil-i **ccwukul-keli**-ess-ta.
skin-NOM wrinkled-KELI-PST-DECL
'The peel was wrinkled'

In (43), one distinguishes a grey-colored area as a unit from the whole surface, whose colors are mixed, and then applies pluralization to that unit. Pluractionality is observed in the spatial domain.

(43) a. nai-ka tul-e melikhal-i **huykkus-keli**-ko
age-NOM get-CONJ hair-NOM grizzled-KELI-and
cwulumsal-i sayngki-ess-ta.
wrinkles-NOM be.formed-PST-DECL
'As getting older, the hair was greyish and wrinkles were formed'

As shown above, the type of pluralized objects varies in time, space, and participant – which is determined by the lexical meaning of the root. Therefore, we can conclude that *keli*-predicates and *tay*-predicates show not only temporal pluractionality but also spatial and participant-based pluractionality.

What, then, are the semantic functions of -*keli*- and -*tay*-? First, both -*keli*- and -*tay*- combine with a root with a repeatable meaning. As mentioned in "*to creat a* ***repeating*** *floral* ***pattern*** *that's perfect for gift wrapping*", the term *repetition* is expandable across the domains. To simplify a discussion, we go back to a repetition in the temporal domain. In (44), one recognizes a set of change as a unit from the whole intermittent change of states. A sequence of different partial changes results in returning at the state of the source, as in (45). In other words, there should be no result from the changes.

(44) a. cenkwu-ka kkampak-**keli**-ess-ta.
lightbulb-NOM flickering-KELI-PST-DECL
'{A/The} light bulb flickered'

b. cenkwu-ka kkampak-**tay**-ss-ta.
lightbulb-NOM flickering-TAY-PST-DECL
'{A/The} light bulb flickered'

(45) a. light [$_{e1}$ on-off-on] [$_{e2}$ on-off-on] [$_{e3}$ on-off-on] [$_{e4}$ on-off-on]

b. light [$_{e1}$ on-off~on~~~on-off-on~on-off~on-off-on]

Second, the difference between event-external and event-internal pluractionality can be interpreted as one between multiplicity from unity and complexity from non-unity.[20] Even though -*keli*- and -*tay*- have a naturally atomic root in common, -*tay*- gets more natural in the context that it is difficult to recognize intermittent points among the natural-atoms. Pluractionality of -*tay*- targets phases in the event as a pluralized object, and derives an event as a result. In order to be pluralized and to avoid individuation into an atom, the *tay*-predicate chooses complexity. This complexity is associated with a negativity or an intensified degree of motion, which has been frequently mentioned as an effect of -*tay*-.

4.3 The Semantic Conditions on the Verbal Complex: V-*e tayta*

In this section, we describe the semantic characteristics of complex predicate construction V-*e tayta* as a repetitive aspect, report the semantic similarity between

[20] cf. Link's (1987) atomicity and granularity; Bach's (1986) packaging and grinding.

verbal derivational suffix -*tay*- and auxiliary verb *tayta* in the construction V-*e tayta*, and then present a pluractional semantics to cover the semantic phenomena observed across the different morpho-syntactic levels. The construction V-*e tayta* is identified as event-internal pluractionality in that repeatability and unboundedness are required as its semantic conditions, like verbal derivational suffix -*tay*-.

(46) a. Mina-ka wus-e **tay**-ess-ta.
M.-NOM laugh-CONJ REPETITIVE-PST-DECL
'The children laughed'

4.3.1 Aspectual Selection of the Verbal Complex with V-*e tayta*

The auxiliary verb *tayta* in the construction V-*e tayta* have the main predicate as a semantic argument. Here, it is observed that the auxiliary verb *tayta* has a domain restriction on the main predicate, which includes the types similar to roots compatible with the suffix -*tay*-. These are activity predicates with a certain manner meaning such as motions and actions and activity predicates of sound emission. Also, predicates derived with suffixes -*keli*- and -*tay*- is applicable to the main verb of V-*e tayta*. In other word, the semantic domain of V-*e tayta* includes derived meanings of derivational suffix -*keli*- and -*tay*-.

(47) TYPE (I) + ^{ok} -*e tayta*

a. **Semelfactive**: ttwi- 'jump,' cic- 'bark,' sso-'shoot (an arrow),' chi- 'hit (the bell), kkomcilak-keli- 'wriggle'

b. **Intermittent activity**:

(i) talli- 'run,' mil- 'push,' wus- 'laugh,' nolli- 'make fun of,' huntul-tay- 'shake'

(ii) pethi- ‘endure’, kyenti- ‘endure / tolerate’

(iii)kippeha- ‘be pleased’, koyloweha- ‘be tormented’, ttukeweha- ‘feel hot’, yeyppeha- ‘adore’

In contrast, predicates in (48) are not compatible in the V-*e tayta* construction.

(48) TYPE (II) + * -*e tayta*

a. **State**:

(i) noph- ‘high’, ppalkah- ‘red’

(ii) kippu- ‘glad’, koylop- ‘painful’, ttukep- ‘hot’, yeyppu- ‘beautiful’

b. **Divisive activity**: kitali- ‘wait’, memwulu- ‘stay’, sal- ‘live on’

Here, incompatibility of divisive activity predicates as well as stative predicates clarifies one criterion for determining the semantic domain of V-*e tayta*: non-divisivity.

(49) a. [+dynamic, +cumulative, −**divisive**, +natural-atomic] + ^{ok} -*e tayta* = (47a)

b. [+dynamic, +cumulative, −**divisive**, − natural-atomic] + ^{ok} -*e tayta* = (47b)

(50) a. [−dynamic, +cumulative, <u>+divisive</u>, − natural-atomic] + * -*e tayta* = (48a)

b. [+dynamic, +cumulative, <u>+divisive</u>, − natural-atomic] + * -*e tayta* = (48b)

In fact, non-divisivity is not restricted to semelfactives and intermittent activites. Telic predicates such as accomplishments and achievements are also non-divisive. In (51), V-*e tayta* is compatible with lexical items, which are classified into the lexical aspects of accomplishments, achievements, and degree-achievements. However, not all the telic predicates are compatible with V-*e tayta*, as in (52).

(51) TYPE (III) + ^{OK} -*e tayta*

a. **Achievement**: chwulphanha- ‘publish (books)’, cwuki- ‘kill (bugs)’, nah-

'give a birth to (babies)'

b. **Creation event**: cis- 'build (houses)', ttwulh- 'dig/make a hole'

c. **Change of State**: nelphi- 'widen (the street)', sikhi- 'cool (the soup)', olli- 'increase (the temperature)', nayli- 'decrease (the temperature)'

d. **Change of Location**: olmki- 'move (an object)', ponay- 'send (a letter)', ttelettuli- 'drop (an object)', olu- 'climb (the moutain)', nayli- 'unload (objects from the truck)'

(52) TYPE (IV) + * -*e tayta*

a. **Achievement**: chwulphan**toy**- 'be published', cwuk- 'die', thayena- 'be born', tachi- 'be injured', tochakha- 'arrive'

b. **Creation event**: ci**eci**- 'be built', ttwulh**li**- 'be perforated'

c. **Change of State**: nelp**eci**- '(the street) widen', sik- '(the soup) cool', olu- '(the temperature) increase', nayli- '(the temperature) decrease'

d. **Change of Location**: olmky**eci**- '(the object) get moved', ponay**ci**- '(a letter) be sent', ttel**eci**- '(the object) fall', olu- 'climb (onto the roof)', nayli- 'get off (a bus)'

In fact, we can see that there is a difference between predicates in (51) and (52). Predicates in (52) seem to be on the opposite side of (51) in terms of activeness or causativeness. They appear to be acting like passives or inchoatives.

Furthermore, (51) does not just have an active or causative form. Predicates in (51) are naturally combined with V-*e tayta* when an appropriate argument is provided. For example, V-*e tayta* cannot combine with the type of creation events which have a definite object as an incremental theme, as in (53).

(53) a.	Mina-ka	**<u>ku</u>**	cip-ul	ci-e	tay-ess-ta.
	M.-NOM	that	house-ACC	build-CONJ	REPETITIVE-PST-DECL

??'Mina repeated the completion of that house'

b. Mina-ka **ku** kwumeng-ul ttwulh-e tay-ess-ta.
M.-NOM that hole-ACC make.a.hole-CONJ REPETITIVE-PST-DECL
??'Mina repeated the creation of that hole'

What counts as a creation event is to a change of existence such that the existence of a certain object is converted from the state 'not-to-be' to the state 'to-be'. An object which has already existed cannot have a creation event applied to it because it is not in the state 'not-to-be.' The same thing happens with an object which comes to exist as the result of the creation event. For this reason, the type of creation events cannot *consecutively* occur to one specific object. This is because the result state of some creation event (e.g. the existence of object) cannot satisfy the condition for occurrence of the following creation event (e.g. the absence of object). This characteristic is referred to by the term *one occurrence event*.

A repetition of creation event with a definite object is not totally impossible. It is possible if there is a process that the existence of object goes back to the absence before the following creation event starts. For example, temporal adverb *tasi* 'again' has a corrective reading in company with an accomplishment predicate, rather than a repetitive reading ('simple repetition') or a restitutive reading ('recovery') (Yoon 2007:15). The adverb *tasi* implies the cancellation of the result of the previous (presupposed) event and enables a repetition of creation events with a definite object.

(54) Mina-ka **ku** cip-ul tasi ci-ess-ta.
M.-NOM that house-ACC again(CORRECTIVE) build-PST-DECL
'Mina built that house again' ('corrective reading')

In comparison, the repetition type of V-*e tayta* at least cannot imply this kind of cancelation; furthermore, it can be stipulated that V-*e tayta* keeps other types of events from intervening among repeated units. In (55), creation events are natural in company with V-*e tayta* when a bare noun is given as an incremental theme. Creation events either can consecutively occur across more than one object, or can target only one object in progress.

(55) a. Mina-ka cip-ul ci-e tay-ess-ta.
M.-NOM house-ACC build-CONJ REPETITIVE-PST-DECL
'Mina kept building {a house/houses}'

b. Mina-ka kwumeng-ul ttwulh-e tay-ess-ta.
M.-NOM hole-ACC make.a.hole-CONJ REPETITIVE-PST-DECL
'Mina kept making {a hole/holes}'

The preference to bare nouns as an incremental theme is observed throughout (51). Accomplishments with a bare noun as an incremental theme are considered an unbounded event which is cumulative and non-divisive. Here, we suggest cumulativity as another property which works on the semantic codition of V-*e tayta*.

(56) a. [+dynamic, **+cumulative**, −divisive, − natural-atomic] + ^{OK} -*e tayta* = (51)

b. [+dynamic, <u>−cumulative</u>, −divisive, − natural-atomic] + * -*e tayta* = (51)

(57) [+dynamic, <u>−cumulative</u>, −divisive, − natural-atomic] + * -*e tayta* = (52)

Cumulative and non-divisive property should be maintained in all the types of predicates in (47) and (51).

First, V-*e tayta* cannot combine with quantized events. V-*e tayta* shows the same behaviors as the suffix -*tay*- in terms of countability. Kim, S-H (2003) argues that a

singular argument is banned from combining with V-*e tayta*.

(58) (Kim, S.-H. 1990/1992/2003:187)

a. *Yenghuy-nun say os **han pel**-ul ip-e tay-nta.
Y.-TOP new clothes one CL-ACC put.on-CONJ REPETITIVE-DECL
'Yeonghuy keeps putting on a suit of new clothes'

b. *Chelswu-nun kulim **han cang**-ul kuli-e tay-nta.
C.-TOP picture one CL-ACC draw-CONJ REPETITIVE-DECL
'Cheolsu keeps drawing a piece of picture'

In (59), however, incompatibility is also observed in plural arguments with a measure phrase. Likewise, the same pattern appears in cardinal count adverbials, as in (60). Thus, (58) can be explained together with (59) and (60): the incompatibility is not because the objective argument of the verb is not plural, but because there is a measure phrase which is associated with measuring the event.

(59) a. Mina-ka kulim(??**sey cang**)-ul kuli-e tay-ess-ta.
M.-NOM picture three CL-ACC draw-CONJ REPETITIVE-PST-DECL
'Mina kept drawing three pieces of pictures'

b. Mina-ka mwul(??**sey can**)-ul masi-e tay-ess-ta.
M.-NOM water three CL-ACC drink-CONJ REPETITIVE-PST-DECL
'Mina kept drinking three classes of water'

(60) Mina-ka cip-ul **ney pen** ci-e tay-ess-ta.
M.-NOM house-ACC four time build-CONJ REPETITIVE-PST-DECL
(i) # 'Mina did building {a house/house} over four times'
(ii) ? 'The number of occasions where Mina kept building is four'

But that does not mean V-*e tayta* prohibits all the measurement. In (61), V-*e*

tayta is unnatural in company with *chong* 'total', which indicates that the whole amount is measured. On the other hand, the distributive share marker *-ssik* rescues a measure phrase in the sentence with V-*e tayta* in (62). *-ssik* targets on each unit which is repeated in the whole event. If it is not the whole amount that is measured, then a measure phrase appears with V-*e tayta*.

(61) a. Mina-ka kulim-ul (*<u>**chong sey cang**</u>) kuli-e tay-ess-ta.
M.-NOM picture-ACC (total three CL) draw-CONJ REPETITIVE-PST-DECL
'Mina kept drawing three pieces of pictures (*in total)'

b. Mina-ka (*<u>**chong sip khillomithe**</u>-lul) talli-e tay-ess-ta.
M.-NOM (total 10 kilometer-ACC) run-CONJ REPETITIVE-PST-DECL
'Mina kept running 10 kilometers (*in total)'

(62) a. Mina-ka kulim-ul <u>sey cang*(-**ssik**)</u> kuli-e tay-ess-ta.
M.-NOM picture-ACC three CL(-DSH) draw-CONJ REPETITIVE-PST-DECL
'Mina kept drawing three pieces of pictures *(at a time)'

b. Mina-ka <u>sip khillomithe*(-**ssik**)</u> talli-e tay-ess-ta.
M.-NOM 10 kilometer(-DSH) run-CONJ REPETITIVE-PST-DECL
'Mina kept running 10 kilometers *(at a time)'

Conversely, it is also possible to measure the occasions, not the number of single repetitions.

(63) Mina-ka <u>**ney pen**</u> cip-ul ci-e tay-ess-ta.
M.-NOM four time house-ACC build-CONJ REPETITIVE-PST-DECL
(i) # 'Mina did building {a house/house} over four times'
(ii) 'The number of occasions where Mina kept building is four'

V-*e tayta* requires no measurement on the whole event, which means that the

whole event has no end point. This unboundedness results in examples of accomplishments without a transition point.

First, *-man* blocks the measurement. In (64), the definiteness can be used for individual-referring without a measurement, as in (64-(i)), or kind-referring, as in in (64-(ii)).

(64) Mina-nun ku kulim-**man** kuli-e tay-ess-ta.
M.-TOP that picture-only draw-CONJ REPETITIVE-PST-DECL
(i) 'While keeping drawing {the/that} picture without the completion, Mina did not draw anything else'
(ii) 'Mina drew the same picture all the time when she drew something'

Second, manner adverbs rescue the unnatural sentences shown above, as in (65). Pustejovsky (1991) defines accomplishments and achievements as a *transition* which consists of a *preparatory process* and an *opposition*. A preparatory process itself corresponds to the type of activity in terms of the aspectual characteristic, then the preparatory process is bounded by reaching a transition point. Manner adverbs highlight a preparatory process not to attain a transition point. We can tract the existence of preparatory process more easily in help with a specified manner. On the other hand, the appearance of result state adverbs confirms that a change has already occurred, i.e. there is a transition point. Result state adverbs in (66) do not show a rescuing effect.

(65) a. Mina-ka **ku** cip-ul **yelsimhi** ci-e tay-ss-ta.
M.-NOM that house-ACC enthusiastically build-CONJ REPETITIVE-PST-DECL
'Mina kept building the house enthusiastically'

b. Mina-ka **ku** kwumeng-ul **sinna-key**
M.-NOM that hole-ACC cheerful-ADV
ttwulh-e tay-ss-ta.
make.a.hole-CONJ REPETITIVE-PST-DECL
'Mina kept making the hole cheerfully'

(66) a. Mina-ka **ku** cip-ul ?(?**thunthunha-key**)
M.-NOM that house-ACC (firm-ADV)
ci-e tay-ss-ta.
build-CONJ REPETITIVE-PST-DECL
'Mina kept building the house (firmly)'

b. Mina-ka **ku** kwumeng-ul *(***wanpyekha-key**)
M.-NOM that hole-ACC pefect-ADV
ttwulh-e tay-ss-ta.
make.a.hole-CONJ REPETITIVE-PST-DECL
'Mina kept making the hole (perfectly)'

(67) [Condition IV-2] REPEATABILITY: there is a cumulative and non-divisive event.
[+dynamic, +cumulative, −divisive]
(i) Intermittent activity
(ii) Semelfactive,
(iii) Accomplishment without a transition point

The semantic condition of V-*e tayta* is a repeatable event.

4.3.2 The Semantic Interpretations of V-*e tayta*

We have two types of repetitive readings from V-*e tayta*. One is '*Do not just end at the end point! Restart immediately!*;' the other is '*Keep on doing it with no end!*.'

The former is demonstrated in (68-(i)) and the latter in (68-(ii)).

(68) Mina-ka cip-ul ci-e tay-ess-ta.
M.-NOM house-ACC build-CONJ REPETITIVE-PST-DECL
(i) 'Mina kept building houses'
[…house~house~house~house…]
(ii) 'Mina kept building a certain house'
[…$wall_1$~door~floor~$wall_2$~windows~roof…]

Accomplishments are coerced into activity-like preparatory process before reaching a telic point. Wood (2007) points out that event-internal pluractional makes an event contour aspectual-coerced by eliminating the transition from the event contour. Furthermore, the agentivity of V-*e tayta* is associated with an agentive predicate within the initial subevent of an event structure (cf. Dowty 1979).

(69) a. Mina-ka cip-ul cis-ta 'for Mina to build {a house/houses}'
cause([**act**(m, *y*)], **become**(house(*y*)))
b. cip-i ci-eci-ta 'for {a house/houses} to get built'
become(house(*y*))

Meanwhile, there has been an analysis that considers the semantic function of V-*e tayta* construction as something other than a repetition meaning. Kwon (1998) classifies V-*e tayta* ('take' in his translation) into an emphatic modality.[21] Lee H-H (2013) mentions that the emphasis on verbs is related to the *intensity* of activity

[21] Kwon, J-I (1998) classifies V-*e tayta* ('take') into an emphatic modality, with V-*e ssahta* ('build') and V-*e ppacita* ('fall into'), and only V-*ko-nun hata* ('do') as an iterative aspect.

while the emphasis on adjective is related to the degree of state. An intensified degree reading of V-*e tayta* occurs with a result that the heterogeneity of inner structure is well-recognized, as in (70).

(70) a. Mina-ka cip-ul **cengsinepsi** ci-e tay-ess-ta.
M.-NOM house-ACC frantically build-CONJ REPETITIVE-PST-DECL
'Mina kept building {a house/houses} frantically'

b. Mina-ka cip-ul **hetwungcitwung** ci-e tay-ess-ta.
M.-NOM house-ACC in.a.tearing.hurry build-CONJ REPETITIVE-PST-DECL
'Mina kept building {a house/houses} in a tearing hurry'

c. Mina-ka cip-ul **makwucapilo** ci-e tay-ess-ta.
M.-NOM house-ACC at.random build-CONJ REPETITIVE-PST-DECL
'Mina kept building {a house/houses} indiscriminately'

d. Mina-ka cip-ul **tulccwuknalcwukha-key**
M.-NOM house-ACC jagged-ADV
ci-e tay-ess-ta.
build-CONJ REPETITIVE-PST-DECL
'Mina kept building {a house/houses} uneven'

(71) a. Mina-ka cip-ul (??**chapwunha-key**) ci-e tay-ess-ta.
M.-NOM house-ACC (calming-ADV) build-CONJ REPETITIVE-PST-DECL
'Mina kept building {a house/houses} (??calmingly)'

b. Mina-ka cip-ul (??**chakunchakun**)
M.-NOM house-ACC (in.a.calm.and.orderly.way)
ci-e tay-ess-ta.
build-CONJ REPETITIVE-PST-DECL
'Mina kept building {a house/houses} (??in.a.calm.and.orderly.way)'

c. Mina-ka cip-ul (??**swunsetaylo**) ci-e tay-ess-ta.
M.-NOM house-ACC (in.order) build-CONJ REPETITIVE-PST-DECL
'Mina kept building {a house/houses} (??in order)'

d. Mina-ka cip-ul (??**pantuspantusha-key**)
M.-NOM house-ACC (all.straight-ADV)
ci-e tay-ess-ta.
build-CONJ REPETITIVE-PST-DECL
'Mina kept building {a house/houses} (??all square and level)'

4.4 The Event-internal/external Repeatability in Verbal Phrases

-keli- and *-tay-* have in common the repeatability condition on their domains. The repeatability condition is defined as cumulative and non-divisive properties. *-keli-* and *-tay-* can derive various types of repetition meanings across the domains – time, space, and entity. In addition, the semantic domain of the V-*e tayta* construction is included in the one of *-keli-* and *-tay-*, in that a dynamic property is added, i.e. there is an event. We observe temporal, spatial, participant-based pluractionality in one marker. Over all, even though the types of objects which are pluralized is based on time, space, and participant, a variety of readings converge into pluractionality which is based on cumulativity and non-divisivity.

How about the distinction between event-external and event-internal pluractionality? *keli*-predicates are either semelfactives or event-internal pluractionals depending on the atomicity of their roots. In contrast, *tay*-predicates are always event-internal pluractionals with all roots; but under event-internal

pluractionality, *tay*-predicates can also be distinguished into two types depending the atomicity of their roots. The atomicity of roots result in the difference between 'multiplicity' from unity and 'complexity' from non-unity (cf. Link's (1987) atomicity and granularity and Bach's (1986) packaging and grinding). The term *non-atomicity* corresponds to a complement of the set which atomicity denotes. Atomicity is defined as "*x* is atomic iff *x* includes nothing but itself inside itself." We can induce a complement of atomic set, namely, "there are other things within *x*." Multiplicity is non-atomicity with the same type of covers; complexity is non-atomicity with a heterogeneous cover. The former represents the case of '*Do not just end at the end point! Restart immediately!*' as in (68-(i)); the latter, the case of '*Keep on doing it with no end!*' as in (68-(ii)). This account can be applied to the difference beween event-external pluractionals ('occurring repeatedly') or event-internal pluractionals of *keli*-predicates in the same way: the former is non-atomic due to multiplicity with the same type of covers; the latter is also non-atomic due to complexity from heterogeneous covers. The atomic one is the only 'occurring once' of *keli*-predicate. The difference between *keli*-predicates and *tay*-predicates in terms of multiplicaity comes down to which unit is a target of multiplicity: either an event or a phase.

One condition for semelfactives is the equivalence relation. The equivalence relation is defined as reflexive, symmetric, and transitive (Partee et al. 1990). As for roots in (9), it is possible to capture a case that all the parts are in the equivalence relation; the whole event corresponds to an equivalence class. Součková (2011) also mentions that naturally atomic verbs are not subject to the non-equivalence condition and their plural events consist of essentially identical

individual event units. Here, we can introduce the concept of equivalence class, which is a set of members which have an equivalence relation (Partee et al. 1990).

Even in light-emissions and sound-emissions, which have no physical trajectory, one can recognize a cover from the whole: a set of *intermittent* change-of-states (intermittent flicking such as *panccak-kelita* 'light off-on-off', *kwung-kwung-kelita* 'silence-sound-silence-sound-silence'). A sequence of different partial changes ('light off' and 'light on'; 'silence' and 'sound') results in returning to the state of the source.

(72) **Connectedness**: A relation R in A is connected (or connex) iff for every two distinct elements x and y in A, $\langle x, y\rangle \in R$ or $\langle y, x\rangle \in R$ (or both). (Partee *et al*. 1990)

On the other hand, if the intermittency of light-emissions or sound-emissions does not exist or at least is difficult to recognize, then *-tay-* targets the characteristics which are able to consist of heterogeneous covers. This provides fuzzy boundaries for covers to be pluralized but not individuated. For example, scattering and reflection, such as *kamwul* 'flickering / muddled' and *pantul* 'glistening / shining,' have inconsistent intensity in terms of dynamicity of strength and weakness.

5 (Non-)Stative Pluractionality of Predicate Reduplication

Among the pluractional phenomena, the most famous form of pluractional markers is a reduplication of verbal roots. It is the primary form of pluractional marker. Everything starts here. In Korean, there are several patterns of predicate reduplication.[22] In (1a-c), two identical verb stems appear across an intervening conjunctive marker.[23]

(1) a. ku-nun keli-lul ket-**ko** kel-ess-ta.
he-TOP street-ACC walk-and walk-PST-DECL
'He walked and walked on the street'

b. kaul hanul-i noph-**ti**-noph-ta.
autumn sky-NOM be.high-TI-be.high-DECL

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[22] This thesis will use the term *reduplication* for syntactic constructions as well as morphological words, in order to avoid confusing the terms *verb* "*repeated*" construction or *verb* "*repetition*" with the terms "*repeated* / *repetitive*" *readings* in the semantic sense.

[23] The sentences of (1a-c) are derived from the following base sentences by repeating verb stems and intervening a conjunctive marker between those stems.

a′. ku-nun keli-lul kel-ess-ta.
he-TOP street-ACC walk-PST-DECL
'He walked on the street'

b′. kaul hanul-i noph-ta.
autumn sky-NOM be.high-DECL
'The autumn sky is high'

c′. khu-n calmos
be.big-ADNOM mistake
'(A) big mistake'

'The autumn sky is extremely high'

c. khu-**na**-khu-n calmos

be.big-NA-be.big-ADN mistake

'(An) enormous mistake'

5.1 Predicate Reduplication Constructions in Korean

Song J-M (2003:48) introduces V-*eto* V-*eto* and V-*ta*(*ka*) V-*ta*(*ka*) as other examples of verb reduplication construction besides V-*ko* V, as in (2).[24] These constructions are distinguished from V-*ko* V in that conjunctive endings as well as verb stems are repeated. Moreover, when we shift the focus onto these repetitions of conjunctive endings, the identical repetitions of verbal stems are not necessary in these constructions. In fact, it is allowed that the preceding and following verb stems are different, such as V1-*eto* V2-*eto* and V1-*ta*(*ka*) V2-*ta*(*ka*) in (3).

(2) (Song J-M 2003:48)

a. mek-**eto** mek-**eto** pay-ka kophu-ta.

eat-CONC eat-CONC stomach-NOM be.hungry-DECL

'[Someone] is hungry despite keeping eating (Lit. [Someone] is hungry

[24] By repeating the combination of a verb stem and a conjunctive ending, the sentences of (2a, b) are derived from the following base sentences. *-eto* is a 'concessive' conjunctive ending (Lee I-S and Ramsey 2000:173); *-ta*(*ka*) is a 'preceding' conjunctive ending (Bak 2014:129).

a′. mek-**eto** pay-ka kophu-ta.

eat-CONC.CONJ stomach-NOM be.hungry-DECL

'[Someone] is hungry despite eating'

b′. wul-**ta(ka)** cichy-ese cam-i tul-ess-ta.

cry-PRCD.CONJ be.exhausted-CONJ sleep-NOM enter-PST-DECL

'[Someone] fell asleep because of being exhausted from crying'

despite eating despite eating'

b. wul-**ta(ka)** wul-**ta(ka)** cichy-ese cam-i tul-ess-ta.

cry-PRCD cry-PRCD be.exhausted-CONJ sleep-NOM enter-PST-DECL

'[Someone] fell aleep because of being exhausted from crying and crying'

(3) a. mek-**eto** masy-**eto** pay-ka kophu-ta.

eat-CONC drink-CONC stomach-NOM be.hungry-DECL

'[Someone] is hungry despite eating and drinking'

b. wul-**ta(ka)** wus-**ta(ka)** cichy-ese cam-i tul-ess-ta.

cry-PRCD laugh-PRCD be.exhausted-CONJ sleep-NOM enter-PST-DECL

'[Someone] fell asleep because of being exhausted from crying and laughing'

In this regard, these constructions themselves could be identified as a repetition of conjunctive endings (Han 2015) rather than verb stems. Then, (2a, b) would be one possible type of conjunctive reduplication construction, just as the case where the preceding verb stem V1 and the following verb stem V2 are identical.

Despite, V-*eto* V-*eto* and V-*ta*(*ka*) V-*ta*(*ka*) in (2a, b) – the forms of V1-*eto* V1-*eto* and V1-*ta*(*ka*) V1-*ta*(*ka*) – are noteworthy as verb reduplication constructions in two respects. First, the repetition of identical verb stems yields a certain semantic effect, which is commonly observed in other verb reduplications. It increases the quantity of event in some dimension. For example, what the sentences yield in (2a, b) are repetitive or durative/continuative readings, where time intervals occupied by ongoing events are extended along the time line.[25] Going back to (2a′, b′) where V1 and V2 are different from each other, the sentences does

[25] These readings are not yielded from (a′, b′) in footnote 24.

not yield these kinds of increases in quantity even though they are semantically related to each other – whether they are either similar or contrastive. V1 and V2 in V1-*eto* V2-*eto* and V1-*ta*(*ka*) V2-*ta*(*ka*) just refer to different types of events respectively.

Second, V1-*eto* V1-*eto* and V1-*ta*(*ka*) V1-*ta*(*ka*) in (2a, b) have an additional constraint on their verbal forms which V1-*eto* V2-*eto* and V1-*ta*(*ka*) V2-*ta*(*ka*) do not have. For example, it is less natural for past tense endings to be inserted in V1-*eto* V1-*eto* and V1-*ta*(*ka*) V1-*ta*(*ka*), as in (4a, b). At most, V1-*ess*-*eto* V1-*ess*-*eto* is read as rhetorical redundant phrase without any semantic effect. On the other hand, V1-*eto* V2-*eto* and V1-*ta*(*ka*) V2-*ta*(*ka*) with past tense endings yield felicitous conjunctive clauses, as in (4a′, b′).

(4) a. ?mek-ess-**eto** mek-ess-**eto** pay-ka kophu-ta.
eat-PST-CONC eat-PST-CONC stomach-NOM be.hungry-DECL
'[Someone] is hungry despite having eaten (Lit. [Someone] is hungry despite having eaten despite having eaten'

b. ?wul-ess-**ta(ka)** wul-ess-**ta(ka)** cichy-ese cam-i tul-ess-ta.
cry-PST-PRCD cry-PST-PRCD be.exhausted-CONJ sleep-NOM enter-PST-DECL
'[Someone] cried, cried, and then fell aleep because of being exhausted'

a′. mek-ess-**eto** masy-ess-**eto** pay-ka kophu-ta.
eat-PST-CONC drink-PST-CONC stomach-NOM be.hungry-DECL
'Despite having eaten and despite having drunk, [Someone] is hungry'

b′. wul-ess-**ta(ka)** wus-ess-**ta(ka)** cichy-ese
cry-PST-PRCD laugh-PST-PRCD be.exhausted-CONJ
cam-i tul-ess-ta.
sleep-NOM enter-PST-DECL

'[Someone] cried, laughed, and then fell aleep because of being exhausted'

Therefore, it is reasonable to accept that the types of V1-*eto* V1-*eto* and V1-*ta*(*ka*) V1-*ta*(*ka*) correspond to verb reduplication constructions while all the V1-*eto* V2-*eto* and V1-*ta*(*ka*) V2-*ta*(*ka*) do not.

Meanwhile, a verb reduplication construction may show a variety of readings under the same form. For example, when V-*eto* V-*eto nemwu* V- has the identical verb stems, as in (5a), the repetition of verb stems in V-*eto* V-*eto* is not required to yield a temporally-distributed reading. On the other hand, V-*eto* V-*eto* in (5b) yields a temporally extended reading, just like in (2a).

(5) a. Mina-nun mek-**eto** mek-**eto** **nemwu** mek-nunta.[26]
Mina-TOP eat-CONC eat-CONC too.much eat-DECL
'Mina eats too much even though [it is just] to eat'

b. Mina-nun mek-**eto** mek-**eto**
Mina-TOP eat-CONC eat-CONC
kyeysok pay-ka koph-ass-ta.
continuously stomach-NOM be.hungry-PST-DECL
'Mina was too hungry despite eating and eating'

[26] The following sentences, where V-*eto* V-*eto nemwu* V- has non-identical verb stems, are unnatural.

a′. *Mina-nun masy-**eto** mek-**eto** **nemwu** mek-nunta.
Mina-TOP drink-CONC eat-CONC too.much eat-DECL

a″. *Mina-nun mek-**eto** masy-**eto** **nemwu** mek-nunta.
Mina-TOP eat-CONC drink-CONC too.much eat-DECL

a‴. ?Mina-nun mek-**eto** mek-**eto** **nemwu** masi-nta.
Mina-TOP eat-CONC eat-CONC too.much drink-DECL
#'Mina drinks too much even though [it is just] to eat'
'Mina drinks too much despite eating and eating'

Here are examples of verb reduplication construction without repeating a conjunctive ending. For example, V-*myen* V-*lswulok* consists of a series of different conjunctive endings and requires the repetition of verb stem. This construction yields a proportional scalar reading (cf. Fillmore 1987; Okamoto 1994), where a two-dimensional scale is introduced. This kind of reading is not necessarily temporal-based.

(6) a. cip-un khu-**myen** khu-**lswulok** pissa-ta.
house-TOP be.big-COND be.big-CONJ be.expensive-DECL
'The larger the house is, the more expensive'

a′.*cip-un khu-**myen** nelp-u**lswulok** pissa-ta.
house-TOP be.big-COND be.broad-CONJ be.expensive-DECL

This chapter examines repeated predicates with the relatively simple conjunctive markers in terms of form and/or meaning. It begins with P-*ko* P and P-*ti*-P.

5.2 Predicate Reduplication: P-*ko* P 'P and P'

Predicate-*ko* Predicate (P-*ko* P) in Korean consists of a repetition of predicate stem and the conjunctive ending -*ko* 'and'.

Compared to English predicate reduplication with a conjunctive marker (V *and* V), Korean predicate reduplication with a conjunctive ending shows a naive domain selection. However, it is still worthy to note that a variety of readings in Korean predicate reduplication depends on the types of base predicates. What is repeated in this construction is a verb (7a) or adjective (7b) stem.

(7) a. Mina-nun talli-**ko** tally-ess-ta.
Mina-TOP run-and run-PST-DECL
'Mina ran and ran / kept running'

b. kohyang-i kulip-**ko** kulip-ta.
hometown-NOM be.sick.for-and be.sick.for-DECL
'I miss my home very much (Lit. [I] am sick and sick for home)'

The predicate reduplication construction P-*ko* P has been reported as a syntactic phrasal construction rather than a morphological reduplication (Song J-M 2003; Byun 2010). Song J-M (2003) defines P-*ko* P as a syntactic phrasal construction, based on the following facts: (i) -*ko* is also permitted in cases where the preceding predicate and the following predicate are different from each other (e.g. *mek-**ko** masi-(ta)* 'to eat and drink'), (ii) the preceding part and the following part can be modified respectively, (iii) another grammatical or lexical element is able to intervene between the preceding and the following predicates. These three facts are true, but they are only based on the conjunctive ending -*ko*. As for the predicate reduplication, the observations are a little different. First, if the preceding stem and the following one are different from each other, it is not a predicate 'reduplication'.

(8) a. Mina-nun ttwuy-**ko** tally-ess-ta.
Mina-TOP jump-and run-PST-DECL
'Mina jumped and (then) ran'

b. kohyang-i sayngkakna-**ko** kulip-ta.
hometown-NOM remind-and be.sick.for-DECL
'I am reminded of my home and I miss it'

Second, even though the predicates in the two clauses are the same, it is hard to

recognize them as predicate reduplications in cases where each stem is modified respectively. There is no semantic effect which is accompanied by predicate reduplication constructions.

(9) a. Mina-nun ppall-i talli-**ko** chenchenhi tally-ess-ta.
Mina-TOP fast-ADV run-and slowly run-PST-DECL
'Mina ran fast and then ran slowly'

b. kohyang-i hanepsi kulip-**ko**
hometown-NOM endlessly be.sick.for-and
enceyna kulip-ta.
always be.sick.for-DECL
'I miss my home endlessly and always (Lit. [I] am sick for home endlessly and sick for home always)'

Third, not all the elements modifiying a simple predicate are able to appear as intervening elements between the conjunctive ending *-ko* and the following predicate stem.

(10) a. Mina-nun talli-**ko** {??chenchenhi/??cokum} tally-ess-ta.
Mina-TOP run-and {slowly/ a.little} run-PST-DECL

b. kohyang-i kulip-**ko** {??kakkum} kulip-ta.
hometown-NOM be.sick.for-and sometimes be.sick.for-DECL

a′. Mina-nun {chenchenhi/cokum} tally-ess-ta.
Mina-TOP {slowly/ a.little} run-PST-DECL
'Mina ran {slowly / a little}'

b′. kohyang-i {kakkum} kulip-ta.
hometown-NOM sometimes be.sick.for-DECL
'I miss my home sometimes'

Then, we need to focus on the predicate reduplication construction itself. Along with the third point mentioned above, there are some elements where the readings are not affected so much by insertion. For instance, the adverb *tto* 'again (in repetitive meanings)'[27] is often added between the conjunctive ending -*ko* and the following predicate in P-*ko* P-. The readings in (11) are not different from the ones of (7). Interestingly, (11b) does not yield a temporally repeated reading, like the absent version of adverb *tto* 'again' in (7b).

(11) a. Mina-nun talli-**ko** **tto** tally-ess-ta.
M.-TOP run-and again(REPETITIVE) run-PST-DECL
'Mina ran and ran (Lit. Mina ran and again ran)'

b. kohyang-i kulip-**ko** **tto** kulip-ta.
hometown-NOM be.sick.for-and again(REPETITIVE) be.sick.for-DECL
'I miss my home very much (Lit. [I] am sick and sick for home again)'

Also, the concessive conjunctive ending -*to* is frequently observed as an intervening element in P-*ko* P even though it is likely to depend on the categories of predicate stems. In cases where a repeated predicate stem is an adjective, the concessive conjunctive ending -*to* is frequently attached after the conjunctive ending -*ko* without changing the sentential reading, as in (12b). On the other hand, when verb stems are repeated, the concessive conjunctive ending -*to* is not felicitous in the sentence, as in (12a).[28]

[27] In Korean, the adverb *tto* '*again* (in repetitive meanings)' is lexically distinguished from the other adverbs *tasi* '*again* (in corrective meanings)' and *tolo* 'again (in restitute meanings).'

[28] The conjunctive ending -*ko* and the concessive conjunctive ending -*to* compose the complex

(12) a.??Mina-nun talli-**ko-to** tally-ess-ta.
M.-TOP run-and-CONC run-PST-DECL
'Mina ran even after she ran'

b. kohyang-i kulip-**ko-to** kulip-ta.
hometown-NOM be.sick.for-and-CONC be.sick.for-DECL
'I miss my home very much (Lit. [I] am sick and sick for home)'

Let us look at sentences which have the adverb *tto* and the conjunctive ending -*to* together. The sentence in (13a) is good compared to (12a). However, the reading is far from the ones in (7a) and (11a), in that each of the two predicate stems in (13a) denote their own running event and these two running events are distinguished from each other with prominent temporal succession. On the other hand, (13b) is not only a felicitous sentence, but it also yields the same reading as (7b), (11b) and (12b). The presence of intervening elements does not show any

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conjunctive ending -*koto*, which expresses 'the preceding clause is factive' (Jang 2009:498) and 'there are contrary or different characteristics' (Kim, K-H 2012:125f) after the stems of (i) verbs, (ii & iii) adjectives, and (iv) copular -*ita*.

(i) Mina-nun pap-ul mek-**ko-to** pay-ka koph-ass-ta.
Mina-TOP meal-ACC eat-SUCC-CONC stomach-NOM be.hungry-PST-DECL
'Mina was hungry even after she had a meal'

(ii) sulphu-**ko-to** alumtawu-n chwuek
sad-SUCC-CONC be.beautiful-ADN memory
'bittersweet memories (Lit. sad but beautiful memories)'

(iii) mel-**ko-to** hemha-n kil
far-SUCC-CONC be.rough-ADN way
'(A/the) far and rough way (Lit. far but rough way)'

(iv) nyusu poto-nun sasilcek-i-**ko-to** kongcengha-mye
news report-TOP factual-be-SUCC-CONC be.unbiased-CONJ
phyenkyen-i eps-eya ha-nta.
prejudice-NOM be.absent-CONJ do-DECL
'A news report should be factual, unbiased and unprejudiced'

particular semantic effect. The readings are not temporally successive ones. The difference between the readings of (13a) and (13b) is exposed as a contrast between (13a′) and (13b′) in terms of grammaticality.

(13) a. Mina-nun talli-**ko-to** **tto** tally-ess-ta.
M.-TOP run-and-CONC again(REPETITIVE) run-PST-DECL
'Mina ran again even after she ran'

b. kohyang-i kulip-**ko-to** **tto** kulip-ta.
hometown-NOM be.sick.for-and-CONC again(REPETITIVE) be.sick.for-DECL
'I miss my home very much (Lit. [I] am sick and sick for home again)'

a′. Mina-nun {akka} talli-**ko-to** **tto** tally-ess-ta.
M.-TOP a.while.ago run-and-CONC again(REPETITIVE) run-PST-DECL
'Mina ran again even though she had run before'

b′. kohyang-i {*akka} kulip-**ko-to**
hometown-NOM a.while.ago be.sick.for-and-CONC
tto kulip-ta.
again(REPETITIVE) be.sick.for-DECL
'I miss my home very much (Lit. [I] am sick and sick for home again)'

Basically, the conjunctive ending -*ko* is subcategorized in terms of structure and/or meaning. One of them is used to indicate that the preceding clause temporally precedes the following clause, and this successive conjunctive ending -*ko* corresponds to a subordinative conjunctive ending (Lee I.-S. 2005: 369; Ko and Ku 2008:491). The successive conjunctive ending -*ko* is reported to have only the verb stems (Mok J.-S. 2012:56). Then, on the basis of the fact that the sentences with verb stems in (7)-(13) have temporal readings, the conjunctive ending -*ko* following the verb stems in (7)-(13) seems to be easily connected with temporal

succession.

Then, what are the usages of the conjunctive ending -*ko* following the adjective stems in (7)-(13)? According to the definition in *The Standard Korean Dictionary* (2015), the conjunctive ending -*ko* corresponds to a coordinate conjunctive ending referring to juxtaposition, confrontation, and emphasis in cases where this ending is attached to adjective stems (Park H-G 2012:92). The definition in *The Grand Dictionary of Korean* [*Ulimal Keun Sajeon*] (1991) is summarized as follows: (i) the conjunctive ending -*ko* can yield coordinative meanings of simple juxtaposition or confrontation, and conditional meanings in combination with all the types of predicate stems, (ii) the meanings of 'precedence', 'ways and means', 'continuity and progression' (in -*ko issta*), 'hope and desire' (in -*ko siphta*), and 'affirmation and emphasis' (in -*ko malko*) occur only in combination with verb stems, and (iii) actions or states are emphasized in cases where -*ko* appears in the form of reduplication of verb and adjective stems (Park H-G 2012:93). In the combination with adjectives and copulas, the conjunctive ending -*ko* does not show temporal readings of simultaneity or succession, but atemporal readings of simple juxtaposition (Yoon 1992:172f). Then, it is likely to sum up that the structures and meanings of conjunctive ending -*ko* depend on the categories of its stems: the type of -*ko* with adjective stems refers to an atemporal reading as a coordinative conjunctive ending, while the one with verb stems referring to temporal reading is a subordinative conjunctive ending. Actually, Byun (2010:484) proposes that A-*ko* A is the simple juxtapositional coordinative construction, and its emphatic meaning is derived from its reduplication pattern. The description that -*ko* is different between V-*ko* V and A-*ko* A would lead us to the conclusion that V-*ko* V and A-*ko*

A are two different things. Then, let us examine whether *-ko* in A-*ko* A is really a coordinative conjunctive ending before we jump to this conclusion.

First, the clauses which are in the coordinative relation are commutative, e.g. their order is reversible. (14a) has the same reading as (14b). The clauses which are in the subordinative relation are not commutative. (15a) and (15b) have a different reading from each other. As for verb reduplications, they are not commutative, as in (16), along with subordinate relations. Then, if adjective reduplications were in the coordinative relation, they would be commutative. However, the sentences in (17) are not commutative.

(14) a. Mina-ka chwumchwu-**ko** nolayha-nta.
M.-NOM dance-and sing-DECL
'Mina danced and sang'

b. Mina-ka nolayha-**ko** chwumchwu-nta.
M.-NOM sing-and dance-PST-DECL
'Mina sang and danced'

(15) a. Mina-ka chwumchwu-**ko nase** nolayha-nta.
M.-NOM dance-SUCC.CONJ sing-DECL
'Mina danced and then sang'

b. Mina-ka nolayha-**ko nase** chwumchwu-nta.
M.-NOM sing-SUCC.CONJ dance-DECL
'Mina sang and then danced'

(16) a. Mina-ka chwumchwu-**ko tto** chwuchw-ess-ta.
M.-NOM dance-and again(REPETITIVE) dance-PST-DECL
'Mina danced and danced'

b. Mina-ka **tto** chwumchwu-**ko** chwuchw-ess-ta.
M.-NOM again(REPETITIVE) dance-SUCC dance-PST-DECL
'Again, Mina danced and danced'

(17) a. kohyang-i kulip-**ko** **tto** kulip-ta.
hometown-NOM be.sick.for-and again(REPETITIVE) be.sick.for-DECL
'[I] miss my home very much'

b. kohyang-i **tto** kulip-**ko** kulip-ta.
hometown-NOM again(REPETITIVE) be.sick.for-and be.sick.for-DECL
'Again, [I] miss my home very much'

Second, the characteristics of the conjunctive ending -*ko* is often evaluated in terms of distributional conditions. For instance, there are two constraints: the first is that the past tense ending is banned in the preceding clause, and the other is that a subject in the following clause should be identical to the one in the preceding clause. The juxtapositional -*ko* has neither of these two constraints. On the other hand, the successive -*ko* has the constraint on the past tense ending in the preceding clause, but not on the identical subject (Mok J.-S. 2012:54; Yoon P.-H. 1991:176ff). The simultaneous -*ko* has both of the constraints (Yoon P.-H. 1991:176ff). Then, it would be expected that -*ko* in verb reduplications as a successive subordinative conjunctive ending has only the past tense ending constraint and -*ko* in adjective reduplications as a coordinative conjunctive ending has no constraints. However, verb reduplications have both of the constraints, as in (18); moreover, adjective reduplications have both of them as well, as in (19). While -*ko* in (18b) can be either a coordinative or a subordinative ending, -*ko* in (19b) is a coordinative ending. Despite this, both sentences in (18b) and (19b) fail to yield the readings of

predicate reduplication constructions.

(18) a. Mina-nun talli{??-ess}-**ko** tally-ess-ta.
M.-TOP run-{PST}-and run-PST-DECL
Intended: 'Mina ran and ran / kept running'

b. Mina-ka talli-**ko** Minho-ka tally-ess-ta.
M.-NOM run-and M.-NOM run-PST-DECL
'Mina ran and Minho ran'
'Mina and Minho ran and ran'

(19) a. kohyang-i kulip{??-ess}-**ko** kuliw-ess-ta.
hometown-NOM be.sick.for-PST-and be.sick.for-PST-DECL
Intended: 'I miss my home very much'

b. hanul-i phwulu-**ko** pata-ka phwulu-ta.
sky-NOM be.blue-and sea-NOM be.blue-DECL
'The sky is blue, and the sea is blue'
#'The sky and the sea are so blue'

Meanwhile, in cases where the sentence with the conjunctive ending *-ko* followed by another ending or particle shows a constraint, it is sometimes analyzed that this *-ko* is not a coordinative conjunctive ending.[29,30] The conjunctive ending -

[29] *-konun* and *-kose* show the constraint on the past tense ending in the preceding clause.

(i) masi-ko-nun / *masi-ess-ko-nun
drink-and-TOP drink-PST-and-TOP
masi-ko-se / *masi-ess-ko-se
drink-and-CONJ drink-PST-and-CONJ

Also, they have the identical subject constraint as well (Jang Y.-H. 2009:492,495).

[30] According to Yoon (1992:181f), it is possible for the successive conjunctive ending *-ko* to be followed by another particle. He also mentions that the simultaneous conjunctive ending *-ko* is

koto shows both the constraint on the past tence ending in the preceding clause and the identical subject constraint (Jang Y.-H. 2009:492, 495). The -*koto* in (20) is along with this characteristics as well.

(20) a. kohyang-i kulip{??-ess}-**ko-to** kuliw-ess-ta.
hometown-NOM be.sick.for{-PST}-and-CONC be.sick.for-PST-DECL
Intended: 'I miss my home very much'

a.??hanul-i phwulu-**ko-to** pata-ka phwulu-ta.
sky-NOM be.blue-and-CONC sea-NOM be.blue-DECL
'Though the sky is blue, the sea is blue'
#'The sky and the sea are so blue'

From (19) and (20), it could be assumed that the -*ko* in the predicate reduplication construction P-*ko* P is derived from the subordinative ending -*koto* by means of an ellipsis of -*to* (cf. Kwon's (1985) proposal that the subordinative -*ko* is from -*kose* by an optional ellipsis of -*se*). However, this kind of assumption is not applicable to V-*ko* V. It is because the presence of -*koto* is not permitted in verb reduplication constructions, as shown above.

Nevertheless, this study will not conclude that V-*ko* V and A-*ko* A are two originally different constructions. In fact, the optionality of the adverb *tto* without

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impossible, except in cases in combination with act-preserving verbs (Yang 1972; 'process-goal-separate verb' in Yang 1978:23) such as *tulta* 'hold', *capta* 'catch', and *tepta* 'wrap.'
In fact, an 'act-preseving' verb preserves its 'resultant state'; thus, the resultant state of event in the preceding clause is overlapped by the event from the following clause (Yoon 1992:177,190; Park J-H 2009). About this, Park J-H (2009) also considers a conjunction in combination with these act-preserving verbs not as the simultaneous conjunctive ending but as the successive one. By reflecting these considerations, it is impossible, without exception, for the the simultaneous conjunctive ending -*ko* to be followed by another particle.

changing the sentential readings is observed in A-*ko* A as well as V-*ko* V. In cases where the adverb *tto* is present in the form of P-*ko tto* P, the two clauses connected by -*ko* are not exactly commutative. It is enough to conclude that the -*ko* in P-*ko* (*tto*) P is a subordinative conjunctive ending.

To summarize, the preceding and the following predicate stems A-*ko* A as well as V-*ko* V are not in a coordinative relation, but rather a subordinative one. Here, the conjunctive meanings are not restricted into temporal succession.

5.2.1 The Semantic Condition of P-*ko* P 'P and P': Cumulativity

The P-*ko* P construction shows a relatively naive aspectual selection on its base predicate. This is based on the fact that it is not on the ground of aspectual class that P-*ko* P excludes a certain predicate.

First, P-*ko* P is in combination with activity predicates whether they are either intermittent (e.g. non-divisive) or divisive, as in (21).

(21) **Activities**

(I) Intermittent Activities: ket- 'walk', mek- 'eat', wus- 'laugh'

a. ku-nun keli-lul <u>ket-**ko** **(tto)** kel</u>-ess-ta.
he-TOP street-ACC walk-and (again) walk-PST-DECL
'He walked and walked on the street'

(II) Divisive Activities: kitali- 'wait', kyenti- 'endure', cham- 'endure', milwu- 'defer'

b. Mina-nun kulehkey hancham-ul <u>kitali-**ko** **(tto)** kitali</u>-ess-ta.
Mina-TOP in.that.way a.while-ACC wait-and (again) wait-PST-DECL
'Mina waited for a long while like that'

Next, Accomplishment and achievement predicates are observed in P-*ko* P, as in (22) and (23), respectively. As for accomplishment predicates, only the preparatory process is focused on as a target to be repeated. A telic point for individuation does not work: it is just passed by one after another preparatory process, as in (22a-i), or is never reached, as in (22a-ii). The reading of (22a-ii) resembles the one of activities. If an incremental theme is obviously bounded, then the sentence with P-*ko* P fails, as in (22b, c).

(22) **Accomplishments**: mantul- 'make', ssah- 'pile up', pwuswu- 'break', chiwu- 'clean up'

a. Mina-nun uyca-lul mantul-**ko** **(tto)** mantul-ess-ta.
M.-TOP chair-ACC make-and (again) make-PST-DECL
(i) 'Mina repeatedly made a chair'
(ii) 'Mina kept doing the chair-making work'

b. Mina-nun ku uyca-lul {***ta**} mantul-**ko** **(tto)** mantul-ess-ta.
M.-TOP that chair-ACC all make-and (again) make-PST-DECL
Intended: 'Mina repeatedly finished making the chair'

c. Mina-nun uyca {***sey kay**}-lul mantul-**ko** **(tto)** mantul-ess-ta.
M.-TOP chair three CL-ACC make-and (again) make-PST-DECL
Intended: 'Mina repeatedly made three chairs at a time'

Meanwhile, achievement predicates are a little different from accomplishments in that their events have no preparatory process. In (23), the only possible reading is that more than one change-of-state event takes place; there is no resemblance to activities. In cases where an achievement predicate refers to single-occurrence events, an argument is required to be unbounded plural in order to yield more than

one event, as in (23c, d).

(23) **Achievements**: pyenha- 'change', tochakha- '(guests) arrive', cwuk- '(soldiers) die', salaci- 'disappear', tathi- 'become closed', yelli- 'become open'

a. keli-ka pyenha-**ko** **(tto)** pyenha-yss-ta.
street-NOM change-and (again) change-PST-DECL
'The street has changed repeatedly'

b. Mina-ka nemeci-**ko** **(tto)** nemecy-ess-ta.
M.-NOM fall.down-and again fall.down-PST-DECL
'Mina fell down repeatedly'

c. kkwulpel??(-tul)-i ??(coyta) salaci-**ko** salaci-n kawuntey, …
bee-PL-NOM all disappear-and disappear-ADN middle
'While all the bees have disappeared, … '

d. ai {*sey myeng}-i salaci-**ko** salaci-n kawuntey, …
child three CL-NOM disappear-and disappear-ADN middle
Intended: 'While three kids have disappeared, … '

Semelfactive predicates are as felicitous in P-*ko* P as activities. Semelfactives in P-*ko* P resemble activities in that the event is composed only of motions and there is no change-of-state. At the same time, P-*ko* P sentences with semelfactives yield the reading that there is more than one motion referred to by the simple predicate, which is like achievements and (partly) accomplishments.

(24) **Semelfactives**: twutuli- 'tap/knock/beat', sso- 'shoot', cha- 'kick', chi- 'beat/punch', ttel- 'vibrate', (kho-lul) kol- 'snore'

a. sanyangkkwun-nun kho-lul kol-**ko** **(tto)** kol-ass-ta.
hunter-TOP nose-ACC snore-and (again) snore-PST-DECL
'The hunter kept snoring'

Degree-achievement predicates are felicitous in P-*ko* P as well. The events referred by these predicates are unlike activities and semelfactives in that there are changes. Moreover, the type of degree-achievement events is different from accomplishments, as well as activities and semelfactives, in that there is no activity part. Also, they are distinguished from achievements in that a degree-achievement event is composed of instantaneous changes where the final state of each change works as the initial state of the immediately following change. As in (25), the P-*ko* P sentence with degree-achievements yields an incremental reading, where the change-of-degrees are connected one after another all over the events temporally distributed, whether an interval intervenes between those changes or not. The changes are in order, which is far from the reading that each change may start at a state different from the final state of its immediately preceding change.

(25) **Degree-achievements**: olu- 'increase', nayli- 'decrease', sik- 'cool', chwuweci- 'become cold', copaci- 'become narrow'

a. cwuka-ka olu-**ko** **(tto)** oll-ass-ta.
stock.price-NOM increase-and (again) increase-PST-DECL
'The stock price increased and increased'

b. kion-i {?sip-to-eyse isip-to-lo}
temperature-NOM {10-degree-from 20-degree-to}
olu-**ko** **(tto)** oll-ass-ta.
increase-and (again) increase-PST-DECL
'The temperature started at 10° and kept increasing toward 20°'
#'The temperature repeated an increase from 10° to 20°'

Then, most stative predicates in P-ko P yield a reading of intensification, as

shown in the examples of A-*ko* A. Characteristically, the adjectives presented in (26) are gradable.

(26) (I) **Emotional states**: sulphu- 'sad', cilwuha- 'boring', komap- 'be.thankful'

a. atul-uy sohayng-i sulphu-**ko** sulphu-l ppwun-i-ta.
son-GEN deed-NOM sad-and sad-ADN just-COP-DECL
'The son's deed is just so sad'

(II)**Perceptional states**: aphu- 'painful', ttakap- 'itch', chwup- 'cold', tal- 'sweet'

b. chwup-**ko** chwuwu-n kyewul
cold-and cold-ADN winter
'the intensely cold winter'

(III)**Dimensional states**: khu-'big/large', cak- 'small/little', kil- 'long', ccalp- 'short', mel- 'far', kakkap- 'near/close (to)', nelp- 'wide/broad', cop- 'narrow', manh- 'many/much', cek- 'a few/little', kwup- 'be bent', napcakha- 'flat', malu- 'dry', cec- 'wet', ppalkah- 'red'

c. nelp-**ko** nelp-un phwul-un pata
wide-and wide-ADN be.blue-ADN sea
'The vast blue sea'

(IV) **Evaluating states**: chaha- 'good-hearted', yeyppu- 'beautiful', chenha- 'humble/lowly/vulgar', hunha- 'commonplace'

d. chakha-**ko** chakha-n wuli atul
good.hearted-and good.hearted-ADN we son
'my son, who is very good-hearted [Lit. our son who is good-hearted and good-hearted]'

In cases where non-gradable adjectives are used in P-*ko* P, intensifications are not likely to be invoked. Instead, the P-*ko* P construction could just make an

emphasis on the adjectival meaning, as in (27a). Otherwise, these P-*ko* P constructions may indicate pluralities of argument. In (27b), there is more than one day, and a daily life in each day is the same as the other days. It could be because the adjective *ttokkathta* with the meaning 'be the same' always requires another entity to which a comparison is applied.

(27) **Evaluating States:** olh- 'right/proper', hankyelkath- 'unchanging/constant'[31]
ttokkath- 'same'

a. ney mal-un cengmal olh-**ko** **tto** olh-ta.
your remark-TOP really be.right-and again be.right-DECL
'You are definitely right (lit. your remark is really right and right)'

b. ttokkath-**ko** ttokkath-un halwu
same-and same-ADN one.day
'the same daily lives [Lit. the same and same day]'

However, the argument plurality of P-*ko* P is also observed in other stative predicates. They do not originally require more than one entity as an argument.

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[31] The following examples are found in *The Standard Korean Dictionary* [*Pyojun-Gugeo-Daesajeon*] (2015).

a. olhta 'right'

(i) sataypwu, senpi, ku cwungeyto cwucheysengi kanghan cisikintuluy cenphokcekin hyeypco epsinun wuliuy taysaka sengkonghal swu epstanun sensaynguy cilonun cengmal olhko olhun malio. [Source: Hyeonjong Yu, *Deulbul*]

(ii) emeniuy selkyoka olhko olhun cwul alkinun almyenseto [*Nadohyang danpyeonsoseoljib*]

b. hankyelkathta 'constant'

(i) cwungyohan ken hankyelkathi, hankyelkathko tto hankyelkathi ku moyangilanun keya! [Pyodoleu Doseutoyepeuseuki, *kalamajopeukauy hyeongjedeul*(*1~3 habbon*)]

(28) (V) **Cognitive states**: al- 'know/recognize'

a. ku salam-tul-kkili-man
that person-PL-PL(among.oneselves)-only
al-**ko** a-nun iyaki-ka iss-ta.
know-and know-ADN story-NOM exist-DECL
'There is a story that only those people know among themselves [Lit. there is a story that only those people know and know among themselves]'

(VI) **Locational/Positional states**: wichiha- 'be located', thongha- 'open onto'

b. ? seysang-uy motun kil-un selo tongha-**ko** tongha-nta.
world-GEN every way-TOP one.another open.onto-and open.onto-DECL
'All roads are connected with one another'

(29) ssah-i- 'pile up', noh-i- 'be lying on/be placed in', ppaci- 'be absent/be missing'

a. ceki-ey ssahi-**ko** ssahi-n nwun-ul chiwu-ela.
there-LOC pile.up-and pile.up-ADN snow-ACC clean.up-IMP
'Clear away the piled-up snow over there'

b. chayksang wuy-ey nohi-**ko** nohi-n mwulken cwung-ey
desk up-LOC be.put-and be.put-ADN thing mid-LOC
'among the things which are put on the desk'

c. tayuywen-tul-i ppaci-**ko** ppaci-n kawuntey,
representative-PL-NOM absent-and absent-ADN middle
hoyuy-ka sicaktoy-ess-ta.
meeting-NOM begin-PST-DECL
'While many representatives were absent, the meeting began [Lit. while the representatives were missing and missing, the meeting began]'

In (30), the adjectives *issta* and *epsta*, and the verb *kacita* require a plural argument in their non-gradable usages such as 'exist', 'non-exist', and 'have'

respectively. An explicitly singular entity is banned from (30a). *kes* 'thing' modified by *kaciko kacita* 'possess and possess' in (30b) refers to plural entities.

(30) (VII) **Existential/Possession states**: iss- 'exist / have-the-financial-means', eps-, 'non-exist / have-no-financial-means', kaci- 'have/possess'

a. amwuli {(i)mathki-l salam-i / (ii)*Mina-ka}
however {entrust-ADN person-NOM / Mina-NOM}
eps-**ko** eps-eto kuleh-ci.
not.exist-and not.exist-CONC be.so-DECL
(i) 'even if there is no one who is entrusted, it's not so good'
(ii) Intended: 'even if Mina is absent, it's not so good'

b. salam-tul-i kaci-**ko** kaci-n kes cwung-ey
person-PL-NOM possess-and possess-ADN thing mid-LOC
'among the things which people possess'

Besides the non-gradable meanings in (30), the adjectives *issta*, *epsta*, and *kacita* have the meanings of 'with or without having the financial means,' which correspond to 'richness.' Under these usages, the adjectives are gradable in that they can be modified by normal degree modifiers like *acwu*, e.g. *acwu issnun cip casik* 'a child whose family is VERY rich.' In (31), we can read an intensification. Based on the examples with a singular argument in (31a, c), it is possible to propose that the P-*ko* P in (31b) yields an intensive reading, rather than a plural reading. The plural meaning part of 'there is more than one person' in (31b) is ascribed to the plural markers on the argument.

(31) a. ku cip-i iss-**ko** iss-e po-ass-ca, elmana iss-keyss-ni.
that house-NOM exist-and exist-CONJ try-PST-CONJ how exist-CNJT-INT

'Even if that family is supposed to be very rich, how much do they have? [Lit. as the house tried to be rich and rich, how rich would they be]'

b. eps-**ko** eps-nun salam-tul-kkili
not.exist-and not.exist-ADN person-PL-PL(among.oneselves)
top-ko sal-aya ha-nta.
help-and live-CONJ do-DECL

'Very poor people should help among themselves [Lit. Poor and poor people should help among themselves]'

c. enu cengto kaci-**ko** kaci-n salam-i han myeng
which degree possess-and possess-ADN person-NOM one CL
philyoha-ta.
be.necessary-DECL

'[We] need one person who has some degree of financial means'

Through the examples from (21) to (31), there seems to be divisions in the P-*ko* P construction: the events in (21)-(25) show temporally distributed readings, gradable states in (26) yield intensive readings, and non-gradable states in (27) show a plurality of argument or an expressional emphasis. Then, we might be led to an expectation that the type of event is concerned only with temporal readings, but not with intensive readings or plurality of argument. However, we have other cases.

Psychological events, referred to as so-called psych-predicates, show a variety of readings. The predicates denoting perception and cognition events in (32) yield temporally distributed readings in the form of P-*ko* P: a repeated reading or a continuative reading.

(32) (I) **Perception events**: po- 'look', tut- 'listen', maspo- 'taste', math- 'smell'

a. naymsay-lul math-**ko (tto)** math-ato soyongeps-ta.
odor-ACC smell-and (again) smell-CONC be.unavailing-DECL
'It is no use to keep smelling'

(II) **Cognition events**: sayngkakha- 'think', kwungliha- 'think (of)/ponder', kacengha- 'assume'

b. sayngkakha-**ko (tto)** sayngkakha-n kkuth-ey
think-and (again) think-ADN end-LOC
nayli-n kyellon-i-ta.
make-ADN conclusion-COP-DECL
'It is the decision which was given after thinking and thinking'

In (33), the types of emotional and evaluative events are intensified where the predicates are in the P-*ko* P. They do not necessarily have to have a temporal reading.

(33) (III) **Emotional events** (Psych events in narrow sense): culki- 'enjoy', kippeha- 'be glad/rejoice', salangha- 'love', mwuseweha- 'fear', cilwuhayha- 'be bored'

a. ku-nun sungli-lul kippeha-**ko (tto)** kippeha-ess-ta.
he-TOP victory-ACC rejoice-and (again) rejoice-PST-DECL
'He rejoiced over a victory so much'

b. Mina-nun tasi-nun o-ci anh-ul ku swunkan-ul
M.-TOP again-CNTR come-CI NEG-ADN that moment-ACC
culki-**ko (tto)** culky-ess-ta.
enjoy-and (again) enjoy-PST-DECL
'Mina enjoyed a full measure of that moment that will not come again'

(IV) **Evaluative events**: conkyengha- 'respect', kamsaha- 'appreciate', hwuhoyha- 'regret', komaweha- 'appreciate'

c. pwumonim-kkey kamsaha-**ko** kamsaha-nun maum
parents-DAT thank-and thank-ADN mind
'A gratitude towards one's parents [Lit. a heart to thank and thank parents]'

With respect to modification by degree modifiers such as *acwu*, *maywu* and *mwuchek* 'very', the predicates in (32) are ungradable, but the ones in (33) are gradable. In this regard, the desire/volitional event predicates such as *palata* 'hope' and *wenhata* 'want' are gradable and yield an intensive reading. Nevertheless, these kind of psychological events do not avoid temporal distributions. Mina's hoping in (34a) takes time which is not so short while the hoping event in (34b) is completed in a moment.

(34) (V) **Desire/Volitional events**: pala- 'hope', wenha- 'want', sowenha- 'wish/hope', kiwenha- 'pray'

a. Mina-ka pala-**ko (tto)** pala-ten aki-lul nah-ass-ta.
M.-NOM hope-and (again) hope-ADN baby-ACC give.birth.to-PST-DECL
'Mina gave birth to a baby whom she had hoped for'

b. wikupha-n swunkan-ey pala-**ko (tto)** pala-l mankhum
urgent-ADN moment-LOC hope-and (again) hope-ADN degree
kancelha-n kes-un ani-ess-ta.
desperate-ADN thing-TOP NEG.COP-PST-DECL
'It was not desperate to the extent of hoping sincerely in an urgent moment'

In summary, the P-*ko* P construction has a domain selection on its base predicate. The common property is cumulativity. This is identified by the examples in (22b, c)

and (23c, d) where an unbounded argument is preferred.

(35) A classification of aspectual charteristics (by means of feature distinctions)

a. [+dynamic, **+cumulative**, −divisive]

(i) Intermittent Activities

(ii) Semelfactives

(iii) The preparatory process of accomplishments

b. [+dynamic, **+cumulative**, +divisive]

(i) Divisive activities

(ii) Degree-achievements with indefinite degrees

(iii) Psychological events

c. [+dynamic, **+cumulative**, −divisive]

(i) Accomplishments with an unbounded incremental theme

(ii) Achievements (with an unbounded plural argument in the case of single-occurrence events)

d. [−dynamic, **+cumulative**, +divisive]

(i) States (with an unbounded plural argument in the case of non-gradable states)

Note that non-gradable statives are also accompanied with an unbounded argument even though they correspond to aspectually cumulative predicates (i.e. cumulative on the time structure). This means that aspectual cumulativity is not a decisive factor to determine the presence of stative predicates in P-*ko* P. Rather, as for statives, the felicity in P-*ko* P depends on their gradability and plurality of their argument. This will be dealt with in introducing a variety of interpretations yielded from P-*ko* P in the next section.

5.2.2 The Semantic Interpretations of P-*ko* P 'P and P'

As shown above, aspectual classes do not determine the felicity of the predicate in the P-*ko* P construction, at least directly. Rather, they concern the types of derived readings from sentences with P-*ko* P.

Sentences with P-*ko* P yield various types of interpretations: repeated readings, continuative readings, incremental readings, intensive readings and argument-plural readings. Each of these interpretations holds in certain semantic environments. In other words, for each interpretation, P-*ko* P does have its own semantic conditions.

First, temporally distributed readings are derived only with eventive predicates: durative, continuative, and repeated readings. Durative and continuative readings are obtained by an event without culmination such as intermittent activities, divisive activities, and psychological verbs in (36).

(36) a. ku-nun keli-lul ket-**ko** (**tto**) kel-ess-ta.
he-TOP street-ACC walk-and (again) walk-PST-DECL
'He walked and walked on the street'

b. Mina-nun kulehkey hancham-ul kitali-**ko** (**tto**) kitali-ess-ta.
M.-TOP in.that.way a.while-ACC wait-and (again) wait-PST-DECL
'Mina waited for a long while like that'

c. sayngkakha-**ko** (**tto**) sayngkakha-n kkuth-ey
think-and (again) think-ADN end-LOC
nayli-n kyellon-i-ta.
make-ADN conclusion-COP-DECL
'It is the decision which was given after thinking and thinking'

Repeated readings are obtained by semelfactives, accomplishments, and achievements, as in (37). The natural-atomicity of semelfactives, as well as the telic atomicity of accomplishments and achievements, specify a unit which is repeated.

(37) a. sanyangkkwun-nun kho-lul kol-**ko (tto)** kol-ass-ta.
hunter-TOP nose-ACC snore-and (again) snore-PST-DECL
'The hunter kept snoring'

b. Mina-nun thum-man na-myen
M.-TOP interval-only get-COND
cali-lul olmki-**ko (tto)** olmky-ess-ta.
seat-ACC move-and (again) move-PST-DECL
'Mina moved and moved her seat at every opportunity'

c. Mina-ka nemeci-**ko (tto)** nemecy-ess-ta.
M.-NOM fall.down-and (again) fall.down-PST-DECL
'Mina fell down repeatedly'

However, this distinction does not totally depend on the lexical items of predicates. The example in (38a), where an intermittent activity is bounded by a measure phrase, has a repeated reading like (37). On the other hand, the example in (38b) has a durative reading of (ii) when only the preparatory process of accomplishment is highlighted.

(38) a. ku-nun paykmite-lul talli-**ko (tto)** tally-ess-ta.
he-TOP 100.meters-ACC walk-and (again) run-PST-DECL
'He ran 100 meters repeatedly'

b. Mina-nun uyca-lul mantul-**ko (tto)** mantul-ess-ta.
Mina-TOP chair-ACC make-and (again) make-PST-DECL

(i) 'Mina repeatedly made a chair'

(ii) 'Mina kept doing the chair-making work'

In addition, in cases where an event cannot occur repeatedly, as in (39), predicates require plural arguments; otherwise, they are not felicitous in combination with P-*ko* P.

(39) *P-*ko* P

a. with accomplishments as a single-occurrence event with a specific argument

b. with achievements as a single-occurrence event with a specific argument

Second, incremental readings are obtained in cases where the predicate of an event refers to change-of-degree. P-*ko* P yields incremental readings in combination not only with degree-achievements (40a) but also with derived change-of-degree events (40b).

(40) a. cwuka-ka olu-**ko (tto)** oll-ass-ta.
stock.prics-NOM increase-and (again) increase-PST-DECL
'The stock price increased and increased'

b. Mina-nun teyipul-ul te meli olmki-**ko (tto)** olmki-ess-ta.
Mina-TOP table-ACC more far move-and (again) move-PST-DECL
'Mina moved a table farther and farther'

(41) *P-*ko* P
with degree-achievements with specific degrees

Degree-achievement verbs refer to either telic or atelic events depending on context. The sum of '3 degrees increase' and '3 degrees increase' is '6 degrees increase', not '3 degrees increase'; on the other hand, the sum of 'the temperature

increases' and 'the temperature increases' results in 'the temperature increases' in the case 'the temperature' indicates the identical value. The latter is cumulative and divisive in its part-whole structure: for an event, both the sum of events and a part of event has the same properties as the event. The changes sometimes occur at a distance of time, but sometimes do not. The P-*ko* P with degree-achievement in (42a) yields only an incremental reading compared to another construction P-*ko* P-*ko hata* in (42b) which yields a repeated reading.

(42) a. amwuli mwul-ul ppwuli-ko hay-e po-ato,
however water-ACC sprinkle-CONJ do-CONJ try-CONC
matang-un ttukeweci-**ko** **tto** ttukewecy-ess-ta.
yard-TOP become.hot-and again become.hot-PST-DECL
'In spite of trying by spinkling water, the yard became hotter and hotter'

b. amwuli mwul-ul ppwuli-ko haypo-ato,
however water-ACC sprinkle-CONJ do-CONJ try-CONC
matang-un ttukeweci-ko tto ttukeweci-**ko** **hay**-ess-ta.
yard-TOP become.hot-and again become.hot-and do-PST-DECL
'In spite of trying by spinkling water, the yard became hot again and again'

Third, intensive readings are observed typically to originate from gradable states, as in (43). Song J-M (2003) reports that P-*ko* P is also widely used as adjectival reduplication, and Song J-K (2011:306f) states that P-*ko* P constructions with adjectives mean the 'strong intensity' of states while the ones with verbs mean a repetition of activities.

(43) a. nelp-**ko** nelp-un phwul-un pata
wide-and wide-ADN be.blue-ADN sea

'The vast blue sea'

b. … pwukkulep-**ko** pwukkulew-e kyenti-l swu eps-ess-ta.[32]

ashamed-and ashamed-CONJ endure-ADN method NEG.COP-PST-DECL

'[I/someone] could not take it for being too embarrassed'

However, when P-*ko* P yields an intensive reading, a predicate is not restricted to adjectives. Psychological predicates also derive an intensive reading when they are gradable such as emotional events (*kippehata* 'amusing') and volitional events (*pala*- 'hope'and *wenha*- 'want'). Meanwhile, these eventive predicates do not have an incremental reading despite their gradability. This is because the event has no property of change-of-degree.

(44) a. Mina-nun tasi-nun o-ci anh-ul ku swunkan-ul

M.-TOP again-CNTR come-CI NEG-ADN that moment-ACC

culki-**ko** (**tto**) culky-ess-ta.

enjoy-and (again) enjoy-PST-DECL

'Mina enjoyed a full measure of that moment that will not come again'

b. Mina-ka pala-**ko** pala-ten aki-lul nah-ass-ta.

M.-NOM hope-and hope-ADN baby-ACC give.birth.to-PST-DECL

'Mina gave birth to a baby whom she had hoped for'

Here, we reach a consequence: if a predicate is neither eventive nor gradable, then a reading of P-*ko* P cannot be temporally distributed nor degree-intensifying. We have met two other effects in the examples of non-gradable states: (i) emphasis and (ii) argument-plurality. The emphasis seems to be near intensification, but it is

[32] This is brought from a part of example in Song J-M (2003:37), and the glossary is mine.

not the same. This is because there is no change of value – for instance, in (45) there is no 'more right' than what is right. The thing is that the predicate in (45) refers to evaluative states. An emphasis is related to the evaluating attitude in 'I do really agree that your remark is right'.

(45) a. ney mal-un cengmal olh-**ko** **tto** olh-ta.
your remark-TOP really be.right-and again be.right-DECL
'You are definitely right (lit. your remark is really right and right)'

Meanwhile, the argument plurality of P-*ko* P is dependent on plural arguments. P-*ko* P with non-gradable and non-evaluative states is fond of plural markings on arguments, and is infelicitous in contexts without plural arguments.

(46) a. ku salam-tul-kkili-man
that person-PL-PL(among.oneselves)-only
al-**ko** a-nun iyaki-ka iss-ta.
know-and know-ADN story-NOM exist-DECL
'There is a story that only those people know among themselves [Lit. there is a story that only those people know and know among themselves]'

In fact, the class of non-gradable states is not the only predicate where argument plurality is observed. We have already seen examples of single-occurrence events.

(47) a. kkwulpel-tul-i coyta salaci-**ko** salaci-n kawuntey, …
bee-PL-NOM all disappear-and disappear-ADN middle
'While all the bees have disappeared, … '

Here, what is more important is that the argument-plurality is not excluded in other types of predicates. We can check this in a context where the events are temporally

overlapping. In (48a), one person's single pushing event temporally overlaps with the others' pushing events; in (48b), one's pushing events are temporally arranged. Here, P-*ko* P expresses plural events, which are distributed over participants (48a) or time (48b).

(48) a. sey salam-i selo-lul mil-**ko** mi-nun swunkan,
three person-NOM each.other-ACC push-and push-ADN moment
'At the moment when three people push one another, …'

b. ku-ka ku kathu-lul mil-**ko** mi-nun tongan,
he-NOM that cart-ACC push-and push-ADN during
'While he pushes and pushes that cart, …'

P-*ko* P expresses extended meanings on time intervals, events, participants, and degrees. In a durative/continuative reading, the amount of events is extended as the whole length of time intervals is extended. In a repeated reading, the number of events is extended as the whole length of time intervals is extended. In an incremental reading, the amounts of both events and degrees are extended as the whole length of time intervals is extended. In an intensive reading, the amount of degrees is extended. In an argument-plurality reading, the number or amount of entities is extended. Therefore, as for non-gradable states and single-occurrence events, argument plurality acts as a last resort to rescue this *extendability* of P-*ko* P. The predicates have nothing to do with, but only a participant which is predicated as argument. Then, P-*ko* P makes use of the plurality of participants in order to show that something is extended.

As shown above, the P-*ko* P construction expresses a variety of readings. Based on the fact that there is not any particular restriction to lexical selection other than

extendability, the P-*ko* P construction fairly reflects the semantic properties given by the predicate as an input. Specifically, when P-*ko* P has an intensive reading, there is no particular restriction to lexical selection (cf. Byun 2010) other than gradability. Some predicate reduplication constructions are like P-*ko* P; others are not. Also, the types of intensification vary depending on what kind of predicates come. In the following section, we will introduce another construction of predicate reduplication – the so-called 'adjective reduplication' – which shows a restriction to stative predicates and has an intensive reading.

5.3 The so-called 'Adjective' Reduplication P-*ti*-P

This section introduces another type of predicate reduplication in Korean, which consists of two identical stems and the intervening element -*ti*-. The -*ti*-reduplication has been reported to have two semantic characteristics: (i) a requirement of gradable adjectives and (ii) a meaning of intensification (Song J-M 2003; Byun 2010; Song J-K 2011). We will focus on the semantic phenomena of the -*ti*- reduplication by examining these two characteristics in the following sections.

This type of reduplication is mostly observed with adjectival stems in the form **A-*ti*-A**.

(49) a. kaul hanul-i noph-**ti**-noph-ta.
autumn sky-NOM high-TI-high-DECL
'The autumn sky is extremely high'

b. pata-ka phwulu-**ti**-phwulu-ta.
sea-NOM blue-TI-blue-DECL
'The sea is blue as blue can be / The sea is deep blue'

In this regard, it has been described as adjectival reduplication in the morphological sense (Song J-M 2003; Byun 2010; Song J-K 2011) or in the syntactic sense (McNabb 2012). The former perspectives consider A-*ti*-A as a word which is formed by a morphological word-formation; whereas, the latter one considers it a syntactic phrase.

Among them, Song J-M (2003) defines A-*ti*-A as a morphological reduplication of an adjective, based on the following facts: (i) -*ti*- is not permitted in cases where the preceding predicate and the following predicate are different from each other, (ii) the preceding portion of the predicate and the following portion of predicate cannot be modified respectively, (iii) another grammatical or lexical element is not able to intervene between the preceding and the following portions.

(50) a. (Byun 2010:478)
*nelp-**ti**-kiph-un hoswuska-ey anc-a iss-ta.
broad-TI-deep-ADN lakeside-LOC sit-CONJ exist-DECL
Intended: '[Someone] is sitting down by the broad-deep lake'
b. *nelp-ti-**to**-nelp-un hoswu
broad-TI-CONC-broad-ADN lake
c. *kiph-**ti-tto**-kiph-un hoswu
deep-TI-again-deep-ADN lake

While Song J-M (2003) describes -*ko*- 'and' in P-*ko* P as a conjunctive ending, he rejects considering -*ti*- as a conjunctive one due to the fact that it is used in

producing some complex adjectives and does not carry out extra syntactic functions. He defines A-*ti*-A as a prefix reduplication and considers -*ti*- as an arbitraty phonemic melody which is prescribed for affixes in order to form reduplicative affixes. Song J-K (2011:314) agrees that -*ti*- in the -*ti*- reduplication is not a conjunctive ending, but he considers -*ti*- as a 'melodic overwriting (Inkelas and Zoll 2005:42-43)' element which has replaced the sentence-final ending -*ta*. In his argument, -*ti*- is not an element connecting between reduplicated adjective stems, but the part of a reduplicant where the whole simple form of an adjective is reduplicated, in the way that [noph-ta]$_A$-[noph-ta]$_A$ has changed into [noph-**ti**]$_A$-[noph-ta]$_A$.

Here, we cannot make a conclusion on what exactly -*ti*- is. This is because the methods such as insertion and substitution are not applicable when examining an internal part of the -*ti*- reduplication, as mentioned by Song J-M (2003).[33]

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[33] The immediately earlier form of the -*ti*- reduplication can be found in historical data. In *The Grand Dictionary of Korean – Vol. 4 Middle/Modern Language and Idu* [*Ulimal Keun Sajeon, – je 4-kwon Yesmalkwa Idu*] (1991), the lexical entries -*tóy* and -*tuy*, which are described as -*ti* in Modern Korean, are classified as 'ending' and exemplified in the following example.

(i) a. An example of lexical entry -*tóy* in *the Grand Dictionary of Korean – Vol. 4* (1991):
kutóy iceylo cocha hwulo muluys thamum kikkuywa mangnyengtoyn sóyngkak motun capnyem isnón kesól moncye móynglyekul kachowa ilcyel mwulnichye póliko kankancyengcyeng(malu**tóy** maluko co**thuy** cothónmal)hi syusuphóya hónnas nyemtwuey taman chakhón ilpyenman sóyngkakhóye ka <*Kyeongshinlok Eonhae* 37> (=tuy)

b. kan-kan-cyeng-cyeng-(malu-**tóy** malu-ko coh-**tuy** coh-tó-n mal)-hi

c. [[malu-**tóy** malu]-ko [coh-**tuy** coh]]-tó-n mal
dry-TÓY dry-CONJ clean-TUY clean-CONJ-ADN word
'the word which means that [someone] is emotionless and pure-hearted'

Actually, besides the fact it is from the 17th centuries and is not such an old form, this example does not show any particular story with regard to the status of -*ti*-. However, the interesting

Meanwhile, Byun (2010:479) mentions that the -*ti*- reduplication shows the same syntactic distributions as ordinary adjectives: as a main predicate of sentence (49), as a modifier of nominals (in combination with an adnominal conjunctive ending) (51a), and as an adverb (in combination with an adverbial conjunctive ending) (51b).

(51) (Byun 2010:478f)

a. cha-**ti**-cha-n kongki-ka maum-ul senulha-key ha-nta.
cold-TI-cold-ADN air-NOM mind-ACC cool-ADV do-DECL
'The ice-cold air makes one's mind chilly [Lit. cold-cold air makes mind chilly]'

b. yenghwa-ka sulph-**ti**-sulph-key kkuthna-ass-ta.
movie-NOM sad-TI-sad-ADV end-PST-DECL
'The movie ended in tears [Lit. the movie ended sad-sadly]'

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thing is that there were real conjunctive endings in the same forms of -*tóy* and -*tuy*, which correspond to the conjunctive ending -*toy* in Modern Korean. The following example of -*toy* in Modern Korean is from *The Standard Korean Dictionary* (2015).

(ii) ku-nun khi-ka cak-**toy** maum-un khu-ta.
he-TOP height-NOM little-CONJ mind-CNTR large-DECL
'He is short but broad-minded'

The relation of the elements -*tóy*/-*tuy* in the -*ti*- reduplication with these conjunctive ending forms is uncertain. This needs to be examined in detail with more data. We will put this matter aside and go back to our topic without taking a robust stance on -*ti*-. For now, what is certain is that P-*ti*-P is a morphologically reduplicated form in Modern Korean.

5.3.1 The Semantic Conditions of P-*ti*-P: STATIVITY and SCALAR CUMULATIVITY

The P-*ti*-P reduplication shows a strong restriction on aspectual selection, unlike P-*ko* P-. It has been reported that gradable adjectives appear in P-*ti*-P (Song J-M 2003; Byun 2010; Song J-K 2011 and so on). From this, two semantic properties are extracted: stativity and scalarity.

First, let us examine the stativity. The dynamic predicates in (52) cannot appear in the -*ti*- reduplication.

(52) (I) **Intermittent Activities:** ket- 'walk', mek- 'eat', wus- 'laugh'

a. *talli-**ti**-tallita
run-TI-run

(II) **Divisive Activities:** kitali- 'wait', kyenti- 'endure', cham- 'endure'

b. *kitali-**ti**-kitalita
wait-TI-wait

(III) **Semelfactives**: sso- 'shoot'

c. *hwasal-ul sso-**ti**-ssota
arrow-ACC shoot-TI-shoot

(IV) **Accomplishments:** mantul- 'make'

d. *mantul-**ti**-mantulta
make-TI-make

(V) **Achievements:** pyenha- 'change', tochakha- 'arrive', cwuk- 'die', tathi- 'become closed', yelli- 'become open'

e. *pyenha-**ti**-pyenhata
change-TI-change

(VI) **Degree-achievements:** olu- 'increase', nayli- 'decrease', chwuweci- 'become cold', copaci- 'become narrow'

f. *chwuweci-**ti**-chwuwecita

become.cold-TI-become.cold

Stative predicates in (53) are compatible with the -*ti*- reduplication.[34] These

[34] Byun (2010:478) presents that the following lexical entries which are listed in the form of Adjectival stem-*ti*-Adjective in *The Standard Korean Dictionary*.

(i) *kakkap-ti-kakkapta* (close/near), *kanul-ti-kanulta* (thin/skinny/fine), *kapyep-ti-kapyepta* (light), *kepyep-ti-kepyepta* (light), *kem-ti-kemta* (black), *kop-ti-kopta* (beautifual/nice/soft/fine), *kil-ti-kilta* (long), *kiph-ti-kiphta* (deep), *nelu-ti-neluta* (extensive/wide), *nelp-ti-nelpta* (large/wide), *noph-ti-nophta* (high), *nwulu-ti-nwuluta* (yellow), *ta-ti-talta* (sweet), *toy-ti-toyta* (stiff/thick), *twukkep-ti-twukkepta* (thick), *ttelp-ti-ttelpta* (bitter/astringent), *mayp-ti-maypta* (hot/spicy), *mwukep-ti-mwukepta* (heavy), *mwulk-ti-mwulkta* (thin/watery), *mip-ti-mipta* (ugly/hateful), *pwulk-ti-pwulkta* (red), *si-ti-sita* (sour/acidic), *ssu-ti-ssuta* (bitter), *yalp-ti-yalpta* (thin/flimsy), *yeth-ti-yethta* (light/pale), *yeyppu-ti-yeypputa* (beautifual/pretty), *ca-ti-calta* (small/little/fine), *cak-ti-cakta* (small/little), *cop-ti-copta* (narrow/small/cramped), *cith-ti-cithta* (deep/dark/thick/heavy), *cha-ti-chata* (cold), *khu-ti-khuta* (big, large), *phwulu-ti-phwuluta* (blue/azure/green), *huli-ti-hulita* (muddy/cloudy/faint/blurred), *huy-ti-huyta* (white)

Lee J.-Y. (2008:150) adjusts the list of Adjectival stem-*ti*-Adjective. By consulting the frequencies in the corpus data, the words in (ii) are excluded from (i) and the ones in (iii) are added.

(ii) *kepyep-ti-kepyepta* (light), *nelu-ti-neluta* (extensive/wide), *toy-ti-toyta* (stiff/thick), *mwulk-ti-mwulkta* (thin/watery), *mip-ti-mipta* (ugly/hateful), *yeth-ti-yethta* (light/pale), *cith-ti-cithta* (deep/dark/thick/heavy), *huli-ti-hulita* (muddy/cloudy/faint/blurred)

(iii) *kangha-ti-kanghata* (strong), *kwulk-ti-kwulkta* (thick), *kwuyha-ti-kwuyhata* (precious/rare), *nalk-ti-nalkta* (old), *nac-ti-nacta* (low), *nulk-ti-nulkta* (old), *tal-ti-talta* (sweet), *ttukep-ti-ttukepta* (hot), *malk-ti-malkta* (clean/pure/clear), *mel-ti-melta* (far), *palk-ti-palkta* (bright), *sulphu-ti-sulphuta* (sad), *aphu-ti-aphuta* (painful), *yakha-ti-yakhata* (weak), *yath-ti-yathta* (shallow/low), *etwup-ti-etwupta* (dark), *yeli-ti-yelita* (tender/soft/delicate), *cal-ti-calta* (small/little/fine), *celm-ti-celmta* (young/youthful), *cca-ti-ccata* (salty), *ccalp-ti-ccalpta* (short), *chakha-ti-chakhata* (good-hearted), *chenha-ti-chenhata* (humble/lowly/vulgar), *hunha-ti-hunhata* (commonplace).

Byun (2010:482) provides more examples which are not listed in *The Standard Korean*

predicates have no event argument.

(53) (I) **Emotional states**: sulphu- 'sad', cilwuha- 'boring', komap- 'be.thankful'

a. nolay-ka sulphu-**ti**-sulphu-ta.
song-NOM sad-TI-sad-DECL
'The song is so sad'

(II) **Perceptional states**: aphu- 'painful', ttakap- 'itchy', cca- 'salty', tal- 'sweet', ssu- 'bitter', si- 'sour', mayp- 'hot/spicy', tep- 'hot', chwup- 'cold'

b. chwup-**ti**-chwuwu-n kyewul
cold-TI-cold-ADN winter
'the icy-cold winter'

(III) **Dimensional states**: khu- 'big/large', cak- 'small/little', kil- 'long', ccalp- 'short', mel- 'far', kakkap- 'near/close (to)', nelp- 'wide/broad', cop- 'narrow', manh- 'many/much', cek- 'a few/little', ppalkah- 'red', phwulu- 'blue/azure/green'

c. noph-**ti**-noph-un hanul-ul palapo-nta. (Byun 2010:478)
high-TI-high-ADN sky-ACC look-DECL
'[Someone] is looking at the infinitely high sky [Lit. is looking at high-high sky]'

(IV) **Evaluating states**: chakha- 'good-hearted', yeyppu- 'beautiful', chenha- 'humble/lowly/vulgar', yakha- 'weak', hunha- 'common'

Dictionary.

(iv) *kananha-ti-kananhata* (poor), *kayeps-ti-kayepsta* (pitiful/pathetic), *ttakha-ti-ttakhata* (pitiful/pathetic), *pwulep-ti-pwulepta* (envious), *selp-ti-selpta* (sad), *selep-ti-selepta* (sad), *swunha-ti-swunhata* (mild/gentle/docile), *eli-ti-elita* (young), *cilwuha-ti-cilwuhata* (bored/boring), *cinha-ti-cinhata* (strong/dark/deep/thick), *chenha-ti-chenhata* (humble/lowly/vulgar), *chwup-ti-chwupta* (cold)

d. ku ai-nun nemwuto yakha-ti-yakha-key poi-nta. (Byun 2010:479)
that child-TOP too weak-TI-weak-ADV be.seen-DECL
'That child looks too weak'

However, the predicates in (54) are not reduplicated in the form of the *-ti-* reduplication, despite their stativity. As the simplest explanation for this, one might assume that it is because they are not adjective but verbs. However, these data will be approached differently in this study.

(54) (V) **Cognitive states**: al- 'know/recognize'

a. *al-**ti-**alta
know-TI- know

(VI) **Locational/Positional states**: wichiha- 'be located', thongha- 'open onto'

b. seysang-uy motun kil-un selo {*tongha-**ti-**tongha}-nta.
world-GEN every way-TOP one.another {open.onto-TI-open.onto}-DECL
Intended: 'All roads are connected with one another'

(VII) **Existential/Possession states**: iss- 'exist / have-the-financial-means', eps-, 'non-exist / have-no-financial-means', kaci- 'have/possess'

c. pang-ey salam-i {*eps-**ti-**eps}-ta.
room-LOC person-NOM {not.exist-TI-not.exist}-DECL
Intended: 'There is no one in the room'

Some verbs seem to be somewhat acceptable in the *-ti-* reduplication although they are not on the list of lexical entries in the dictionary, as in (55). These verbs all refer to change-of-state.

(55) sik- ‘cool’, nok- ‘melt’, ik- ‘ripen’, sangha- ‘go bad/injured/hurt’, ssek- ‘rotten’, kolm- ‘fester’, tesna- ‘get infected’, talh- ‘wear out’

a. kwuk-i sik-**ti**-sik-ess-ta.
soup-TOP cool-TI-cool-PST-DECL
‘The soup was stone-cold [Lit. the soup cool-cooled]’

b. ku-nun na-eykey nok-**ti**-nok-un aisukhulim-ul naymil-ess-ta.
he-TOP I-DAT melt-TI-melt-ADN ice.cream-ACC stick.out-PST-DECL
‘He held the severely melted ice cream out to me’

c. sangha-**ti**-sangha-n melikhalak
go.bad-TI-go.bad-ADN hair
‘Severely damaged hair’

d. kolm-**ti**-kolm-un sangche
fester-TI-fester-ADN wound
‘The severely festered wound’

e. talh-**ti**-talh-un pyenhosa
worn.down-TI-worn.down-ADN lawyer
‘A lawyer who becomes too crafty with having suffered during one’s early years’

However, these examples cannot lead us to a counter-argument against the stativity condition of *-ti-* reduplication. These verbs refer not to an event but to its resultant state of change in cases where they are reduplicated with *-ti-*. For example, as in (56), P-ti-P with these verbs are not good when an event is ongoing. Also, in (57) a speaker is worried about events that have not yet happened, so that there is no result state of change.

(56) a. kwuk-i {*sik-**ti**-}sik-nun cwung-i-ta.
soup-TOP cool-TI-cool-ADN mid-COP-DECL
Intended: 'The soup is cooling'

b. aisukhulim-i {*nok-**ti**-}nok-nun cwung-i-ta.
ice.cream-NOM melt-TI-melt-ADN mid-COP-DECL
Intended: 'The ice cream is melting'

c. {*kolm-**ti**-}kolm-ko iss-nun sangche
fester-TI-fester-CONJ exist-ADN wound
Intended: 'The wound is festering'

(57) a. ca, mek-ca. kwuk-i {*sik-**ti**-}sik-keyss-ta.
oh eat-EXH soup-TOP cool-TI-cool-CNJT-DECL
Intended: 'Here, let's eat! [or] The soup will cool'

b. ca, mek-ca. aisukhulim-i {*nok-**ti**-}nok-keyss-ta.
oh eat-EXH ice.cream-NOM melt-TI-melt-CNJT-DECL
Intended: 'Here, let's eat! [or] The ice cream will melt'

Therefore, without cancelling the stative condition, we can accept that the -*ti*- reduplication is compatible with verbs as well as adjectives. In this regard, we address the -*ti*- reduplication as P-*ti*-P, in the form of a predicate reduplication; not as A-*ti*-A.

Going back to (54)'s infelicity in P-*ti*-P, it is certain that the semantic domain of -*ti*- is restricted to a certain type of stative predicate. Reported as 'degree expressions' by Song J-M (2003)[35], the stative predicates compatible with -*ti*- are

[35] Song J-M (2003:31) presents the following examples:
(i) *kathta* 'the same':*twu cha-uy kakyek-i kath-ti-kath-ass-ta.

gradable. The predicates in (58) are gradable, which means that they have a scale. On the other hand, non-gradable predicates as in (59) are not able to be reduplicated as P-*ti*-P.

(58) a. **Scalar**: [irreflexive, asymmetric, transitive, connected]

(i) sulphu- 'sad', cilwuha- 'boring', manh- 'many/much', nelp- 'wide/broad', kil- 'long', mel- 'far', cop- 'narrow', chwup- 'cold', ppalkah- 'red'

(ii) sik- 'cool', nok- 'melt', ik- 'ripen', sangha- 'go bad/injured/hurt', ssek- 'rotten', kolm- 'fester', tesna- 'get infected', talh- 'wear out'

(59) a. **Non-scalar**: [reflexive, symmetric, transitive, connected]

iss- 'exist', eps- 'non-exist/absent', olh- 'right/proper', thulli- 'wrong', kath- 'same', ttokkath- 'same', hankyelkath- 'constant', pyenhameps- 'unchanged', yecenha- 'still the same', yuilha- 'unique', kanungha- 'possible', kwankyeyeps- 'unrelated', thullimeps- 'sure'

(60) ne-nun {*yecenha-**ti-**}yecenha-ta.
you-TOP still.the.same-TI-still.the.same-DECL
Intended: 'You are really still the same as before'

Here, scalarity does not replace stativity. This is identified in the behaviors of psychological event predicates. Predicates denoting psychological events are not good in P-*ti*-P whether it is gradable, as in (61), or not, as in (62). The predicate of the desire event *palata* 'hope' is likely to be slightly acceptable. This is similar to the phenomena that *palata* 'hope' has both an intensive reading and a continuative

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Intended: 'the prices of two books are the same'

(ii) *taluta* 'different': *yengkuk-uy saynghwal-un hankwuk-kwa-nun talu-**ti**-tall-ass-ta.
Intended: 'The situation in England is different from the one in Korea'

reading in combination with P-*ko*-P. *palata* 'hope' is not close to episodic compared to other psychological events such as *kippehata* 'amuse'.

(61) **Non-scalar:**

(I) **Perception events**: po- 'look', tut- 'listen', maspo- 'taste', math- 'smell'

a. *math-**ti-**mathta

smell-TI-smell

Intended: 'to smell intensely'

(II) **Cognition events**: sayngkakha- 'think', kwungliha- 'think (of)/ponder', kacengha- 'assume'

b. *sayngkakha-**ti-**sayngkakhata

think-TI-think

Intended: 'to think deeply / repeatedly'

(62) **Scalar:**

(III) **Emotional events**: culki- 'enjoy', kippeha- 'be glad/rejoice', salangha- 'love', mwuseweha- 'fear', cilwuhayha- 'be bored'

a. *kippeha-**ti-**kippehata

rejoice-TI-rejoice

Intended: 'to rejoice very much'

b. *culki-**ti-**culkita

enjoy-TI-enjoy

Intended: 'to enjoy very much'

(IV) **Evaluative events**: conkyengha- 'respect', kamsaha- 'appreciate', hwuhoyha- 'regret', komaweha- 'appreciate'

c. *kamsaha-**ti-**kamsahata

thank-TI-thank

Intended: 'to thank very much'

(V) **Desire events**: pala- 'hope', wenha- 'want', sowenha- 'wish/hope', kiwenha- 'pray'

d. Mina-ka ?pala-**ti-**pala-ten aki-lul nah-ass-ta.
Mina-NOM hope-TI-hope-ADN baby-ACC give.birth.to-PST-DECL
'Mina gave birth to a baby whom she had hoped for'

Thus, these two properties go together in restricting the semantic domain of P-*ti*-P. In other words, the semantic domain of -*ti*- is restricted to predicates which are both stative and gradable, as pointed out through the previous studies such as Song J-M (2003), Byun (2010), and Song J-K (2011).

However, this is not all of the story for P-*ti*-P. Not all the scalar stative predicates can appear in P-*ti*-P.

(63) cha- 'full', pi- 'empty', yeli- '(be) open', tathi- '(be) closed', pwulthwumyengha- 'opaque', malu- 'dry'

a. {*yeli-ti-}yeli-n mwun
open-TI-open-ADN door
Intended: 'A widely open door'

b. {*pi-ti-}pi-n yongki-ey tam-ala.
empty-TI-empty-ADN container-LOC put.in-IMP
Intended: 'Put it in a very empty container'

c. swuken-i {*malu-ti-}mall-ass-ta.
towel-NOM dry-TI-dry-PST-DECL
Intended: 'The towel is very dry'

d. ku-ka moca-lul {*pantusha-ti-}pantusha-ke ss-ess-ta.
he-NOM hat-ACC straight-TI-straight-ADV put.on-PST-IMP
Intended: 'He puts his hat on very straight'

By means of the examples of modification in (64), it is certain that the predicates in (63) are degree expressions.

(64) a. {te/tel} yeli-n mwun
more/less open-ADN door
'{more/less} open door'

b. {te/tel} pi-n yongki-ey tam-ala.
more/less empty-ADN container-LOC put.in-IMP
'Put it in a {more/less} empty container'

c. i swuken-i {te/tel} mall-ass-ta.
this towel-NOM more/less dry-PST-DECL
Intended: 'the towel is very dry'

d. ku-ka moca-lul {te/tel} pantusha-ke ss-ess-ta.
he-NOM hat-ACC more/less straight-ADV put.on-PST-IMP
Intended: 'he puts his hat on very straight'

Actually, these predicates make a class according to some property of scale. Kennedy and McNally (2005:355) provides an explanation on the types of scale by making use of openness and closedness. If a scale has both a maximum element and a minimum element, then it is closed. If a scale has neither a maximum element nor a minimum element, then it is open. If a scale has only a maximum element but not a minimum one, then it is upper closed (and lower open). If a scale has only a minimum element but not a maximum element, then it is lower closed (and upper open).

(65) (Kennedy and McNally 2005:355)

a. Open scale pattern: tall, short, deep, shallow, eager, uneager

(i) Her brother is completely ??tall/??short.

(ii) The pond is 100% ??deep/??shallow.

(iii) Max is fully ??eager/??uneager to help.

b. Lower closed scale pattern: bent, loud, famous

(i) The pipe is fully ??bent/straight.

(ii) The room became 100% ??loud/quiet.

(iii) That author is completely ??famous/unknown.

c. Upper closed scale pattern: certain, pure, safe

(i) We are fully certain/??uncertain about the results.

(ii) This product is 100% pure/??impure.

(iii) The treatment is completely safe/??dangerous.

d. Closed scale pattern: full, empty, open, closed, visible, invisible

(i) The room was 100% full/empty.

(ii) The flower was fully open/closed.

(iii) The figure was completely visible/invisible.

In order for a predicate to appear in P-*ti*-P, the scale of the predicate should be open, as in (66a), or at least upper open, as in (66b).

(66) a. **Fully open Scale** + ^{OK} P-*ti*-P

sulphu- 'sad', cilwuha- 'boring', manh- 'many/much', nelp- 'wide/broad', kil- 'long', mel- 'far', cop- 'narrow', chwup- 'cold', ppalkah- 'red'

b. **Upper open and Lower closed Scale** + ^{OK} P-*ti*-P

cec- 'wet', hwuy- 'be bent' kwup- 'be bent/be crooked', sikkulep- 'loud/noisy', yumyengha- 'famous',

c. **Upper closed and Lower open Scale** + ?? P-*ti*-P

malu- 'dry', kot- 'straight', pantusha- 'be straight', ancenha- 'safe', swunswuha- 'pure', cenghwakha- 'accurate/correct/exact/precise', coyongha- 'quiet', koyoha- 'silent', cekmakha- 'silent'

d. **Fully closed Scale** + * P-*ti*-P

tathi- 'be closed', yelli- 'be open', katukcha- 'full', pi- 'empty', thwumyengha- 'transparent', pwulthwumyengha- 'opaque'

(67) a. Open scale pattern

i. khu-ti-khu-n son
large-TI-large-ADN hand
'really large hand'

ii. kiph-ti-kiph-un pata
deep-TI-deep-ADN sea
'very deep sea'

iii. ssu-ti-ssu-n yak
bitter-TI-bitter-ADN medicine
'really bitter medicine'

b. Lower closed scale pattern

i. kwup-ti-kwup-un heli
bend-TI-bend-ADN waist
'really crooked back'

ii. sikkulep-ti-sikkulew-un umak
noisy-TI-noisy-ADN music
'very noisy music'

iii. cec-ti-cec-un swuken
wet-TI-wet-ADN towel

'very wet towel'

c. Upper closed scale pattern

i. {*cenghwakha-ti-}cenghwakha-n cicem-ey phoysi-lul hata

{precise-TI-}precise-ADN point-LOC mark-ACC do

Intended: 'to mark on very precise point'

ii. {*swunswuha-ti-}swunswuha-n mwul

{pure-TI-}pure-ADN water

Intended: 'very pure water'

iii. moca-lul {*pantusha-ti-}pantusha-ke ssuta

hat-ACC straight-TI-straight-ADV put.on

Intended: 'to put one's hat on straight'

d. Closed scale pattern

i. {*yeli-ti-}yeli-n mwun

open-TI-open-ADN door

Intended: 'a widely open door'

ii. {*pi-ti-}pi-n yongki-ey tam-ala.

empty-TI-empty-ADN container-LOC put.in-IMP

Intended: 'Put it in a very empty container'

iii. sanso-nun {*thwumyengha-ti-}thwumyengha-n kichey-i-ta.

oxygen-TOP transparent-TI-transparent-ADN air-COP-DECL

Intended: 'Oxygen is a very transparent gas'

However, many of the predicates which are classified as upper closed scale and closed scale are observed in the form of P-*ti*-P in cases where they have evaluative stative meanings, as in (68) and (69). Evaluative states have a relative standard on open scale. In evaluative meanings, the scale type of the predicate shifts to open scale.

(68) a. cenghwakha-ti-cenghwakha-n selmyeng
precise-TI-precise-ADN explanation
'very precise explanation'

b. swunswuha-ti-swunswuha-n ai
pure-TI-pure-ADN child
'very pure child'

c. pantusha-ti-pantusha-n sengkyek
straight-TI-straight-ADN personality
'a personality which is very upright and honest'

(69) a. yeli-ti-yeli-n maum
open-TI-open-ADN mind
'very open mind'

b. meli-ka pi-ti-pi-n salam
head-nom empty-TI-empty-ADN person
'someone who is very stupid'

c. twumyengha-ti-twumyengha-n pata
transparent-TI-transparent-ADN sea
'very crystal clear sea'

Then, it is concluded that P-*ti*-P does not combine with a predicate which refers to a state with either closed scale or upper closed scale. P-*ti*-P combines with a stative predicate in which the scale is either open or lower-closed. In other words, a semantic condition of P-*ti*-P is determined as having a state with no maximum element on the scale.

This type of semantic condition is not a strange one. For instance, Henri (2012:218f) points out the openness of scale as one of semantic conditions in

analyzing *Attenuative Reduplication* in Mauritian, a French-based Creole. Attenuative reduplication in Mauritian is relatively closer to P-*ko* P than P-*ti*-P in Korean, in that the reduplication is applied for non-gradable predicates (e.g. activities, accomplishments, and semelfactives) as well as gradable predicates. However, it shows a selective condition on gradable predicates, which resembles to P-*ti*-P rather than P-*ko* P.

Henri (2012:219) proposes that relative predicates and partial absolute predicates (e.g. *mouy* 'wet') can be reduplicated. At the same time, he states that neither closed scalar predicates (e.g. *ferm* 'closed') nor upper closed and lower open scale predicates are reduplicated, with exemplifying infelicity of reduplicating *deteste* 'hate' and *kontan* 'love'.

(70) (Henri 2012:219)[36]

a. Mo 'nn mouy-mouy latab la.
1SG.WF PERF wet-wet.SF table DEF
'I've somewhat wet the table'

b. #Mo 'nn ferm-ferm laport la.
1SG.WF PERF close-close.SF table DEF
'I've somewhat closed the door'

c. *Mo deteste-deteste sa tifi la.
1SG hate-hate.LF DEM girl DEF

(71) (Kennedy and McNally 2005:361)

(i) Gradable adjectives associated with totally open scales have relative standards.

(ii) Gradable adjectives that use totally or partially closed sclaes have absolute

[36] LF = long form (verbs); PERF = perfective; SF = short form (verbs); WF = weak form (pronouns)

standards.

On the basis of two generalization on the relation between open/closedness and relative/absolute standard in (71) presented by Kennedy and McNally (2005:361), Henri's (2012:219) statements are summarized in terms of open/closedness: fully ('totally' in Kennedy and McNally 2005) open predicates and upper open and lower closed predicates can be reduplicated, but fully closed predicates and upper closed and lower open predicates cannot.

This semantic condition of attenuative reduplication coincides with P-*ti*-P in Korean. Upper open scalar predicates are also identified to be felicitously reduplicated as P-*ti*-P in Korean even though they are closed in their lower ends; Mauritian also provides a felicitously reduplicated example of upper open and lower closed scalar predicate *mouy* 'wet' (70a).

The notion of open/closedness is defined in terms of existence of minimal and/or maximal value. The minimal and maximal elements on the scale are located at each end of scale and act as the boundary. In this regard, a scale is either bounded or unbounded.

The four patterns of (un)boundedness based on the open/close scales in (66) are reducible with cumulativity and divisivity on the scale, as in (72). The fully open scales in (66a) correspond to (72a), the lower closed scales in (66b) correspond to (72b), the upper closed scales in (66c) correspond to (72c), and the fully closed scales in (66d) correspond to (72d). Here, we can identify that the semantic condition on the scales of P-*ti*-P is reducible to cumulativity.

(72) (Un)boundedness on Scales

a. Fully unbounded ← **Cumulative** and divisive (e.g. eat apples)

b. Upper unbounded and Lower bounded

↔ **Cumulative** and Non-divisive (e.g. eat much)

c. Upper bounded and Lower unbounded

↔ Non-cumulative and Divisive (e.g. eat a little)

d. Fully bounded → Non-cumulative and Non-divisive (e.g. eat an apple)

5.3.2 'Intensive' Readings of P-*ti*-P

The -*ti*- reduplication has been reported to have a meaning of intensification (Song J-M 2003; Byun 2010; Song J-K 2011). In this subsection, we will examine what the 'intensification' of P-*ti*-P is.

First, a predicate in the form of P-*ti*-P is not the same as a positive adjective. Byun (2010:479) presents the examples of modification by (*maywu, acwu,) mopsi, emcheng* in (73a), and argues that only adverbs referring to a large degree can modify P-*ti*-P.

(73) (Byun 2010:479)

a. {?yakkan/?cokum/?pothong} mayp-ti-maypta

{slightly/a.little/normal} spicy.hot-TI-spicy.hot

Intended: 'slightly highly spicy-hot'

b. {acwu/maywu/kacang/ceyil/mwuchek} mayp-ti-maypta.

{very/very/most/most/very} spicy.hot-TI-spicy.hot

'very highly spicy-hot'

However, adverbs *kacang* and *ceyil* do not seem to be entirely acceptable in P-*ti*-

P. Rather, they are as infelicitous as *yakkan*, *cokum*, and *phothong*. Furthermore, the degree adverbs *acwu* and *maywu* are also degraded compared to *cengmal*, *simhakey*, and *mwuchek*(*-ina*). From (74), we can observe that P-*ti*-P is not the same as an ordinary positive degree adjective.

(74) a. i kephi-nun {yakkan/cokum/pothong-ulo} {*ssu-**ti**-}ssu-ta.
this coffee-TOP {slightly/a.little/normal-INST} bitter-TI-bitter-DECL
Intended: 'this coffee is {slightly/a little/normally} bitter'

b. i kephi-nun {kacang/ceyil} {*ssu-**ti**}-ssu-ta.
this coffee-TOP {most/most} bitter-TI-bitter-DECL
Intended: 'this coffee is bitterest'

c. i kephi-nun {acwu/maywu} {?ssu-**ti**}-ssu-ta.
this coffee-TOP {very/very} bitter-TI-bitter-DECL
Intended: 'this coffee is very bitter'

d. i kephi-nun {chengmal/simhakey/mwuchek(-ina)} ssu-**ti**-ssu-ta.
this coffee-TOP {really/severely/extremely-even} bitter-TI-bitter-DECL
'This coffee is {really/extremely} bitter'

Posive degree predicates can be used to refer to an attribute of scale, where the predicate means that 'x has some degree d on the scale of some attribute'. In (75), *twukkepta* 'thick' means the thickness (e.g. volume) of the book, so that it does not mean that some book is thick. In this usage, positive degree adjectives cannot be replaced for P-*ti*-P, as in (76).

(75) a. A: <u>ttak i cengto-lo</u> twukkew-un chayk-ul chac-ala.
just this degree-INST thick-ADN thick-ACC find-IMP
'Find a book that is just this thick!'

B: kulehkey yalp-ato kwaynchanh-ni?
so thin-CONC okay-INTR
congi twu cang cengto-i-ntey?
paper two CL degree-COP-CONJ
'Even if it were so thin, is it okay? It's only about two pieces of paper!'

A: ung.
yes
'Yes'

(76) (Pointing a thin paperback folded into two pages,)
ttak i cengto-lo {*twukkep-ti-}twukkew-un chayk-ul chac-ala.
just this degree-INST {thick-TI-}thick-ADN book-ACC find-IMP
Intended: 'Find a book that is just this very thick!'

This is not a problem of degree expressions. P-*ti*-P can be modified by degree expressions to express how much the degree is.

(77) <u>i cengto-lo</u> twukkep-ti-twukkew-un chayk-un cheum po-nta.
this degree-INST thick-TI-thick-ADN book-TOP first see-DECL
'I have never seen such an extremely thick book before [Lit. I see an extremely thick book to this extent first]'

Second, a predicate in the form of P-*ti*-P is at least not an ordinary comparative predicate. For instance, introducing differentials is not good.

(78) a. i kamca-ka ce kamca-pota te kulk-ti-kulk-ta.
this potato-NOM that potato-than more thick-TI-thick-DECL
'This potato is larger than that potato'

b. i kamca-ka cekes-pota <u>sam seynthimithe</u> (te) (*kulk-ti)-kulk-ta.
this potato-NOM that-than three centimeter more (thick-TI-)thick-DECL
Intended: 'this potato is larger than that one by 3 cm'

c. kamca-ka sayngkak-pota te kulk-ti-kulk-ta.
potato-NOM thinking-than more thick-TI-thick-DECL
'This potato is larger than I expected'

d. kamca-ka sayngkak-pota <u>sam seynthimithe</u> te (*kulk-ti)-kulk-ta.
potato-NOM thinking-than three centimeter more thick-TI-thick-DECL
'This potato is 3cm larger than I expected'

Third, a predicate in the form of P-*ti*-P is not an ordinary superlative predicate. P-*ti*-P fails to pass the examination of modification by *keuy* 'almost' while ordinary superlative predicates pass.

(79) a. i kamca-ka keuy kacang kulk-ta.
this potato-NOM almost most thick-DECL
'This potato is the almost largest potato'

b. i kamca-ka keuy ceyil kulk-ta.
this potato-NOM almost most thick-DECL
'This potato is the almost largest potato'

c. *i kamca-ka keuy (kulk-ti)-kulk-ta.
this potato-NOM almost thick-TI-thick-DECL
Intended: 'this potato is the almost largest potato'

Byun (2010) argues that the -*ti*- in A-*ti*-A is a connective ending (e.g. a conjunctive ending) and its meaning is very similar to that of the adverb *kacang* 'the most, the best.' A-*ti*-A is considered by him to posit the state of the object to the superlative degree. However, we have already shown the difference between

the P-*ti*-P predicate and an ordinary version with a superlative adverb. Byun (2010) also mentions that this kind of superlative meaning is not an ordinary one by treating it as an *emphasis by the experiencer's subjective judgment*, rather than by an objective judgment.

Now, we need a different reading from the ordinary positive, comparative, and superlative ones. Morzycki (2011) deals with *extreme adjectives* (such as *gigantic*, *fantastic*, or *gorgeous*) and *extreme degree modifiers* (such as *downright*, *flat-out*, *positively*, or *full-on*). Extreme degree modifiers are only compatible with the class of extreme adjectives, as in (80a); at the same time, extreme adjectives show incompatibility with other degree modifiers such as *very*, as in (80b).

(80) (Morzycki 2011:569f)

a. simply {gigantic / ??big}
   just {gorgeous / ??pretty}
   full-on {crazy / ??sane}
   downright {destitute / ??solvent}
   flat-out {excellent / adequate}

b. very {??excellent / ??marvelous / ??fantastic / good}
   very {??gigantic / big}

Morzycki (2011) argues that extreme adjectives operate neither on upper-closed scales nor on lower-closed scales. The former candidate suggested by Paradis (2001) corresponds to a superlative reading, which is based on infelicity with *very*. However, this assumption is refused as extreme adjectives are compatible with comparative morphology unlike upper-closed scale adjectives, as in (81). The latter candidate proposed by Rett (2008a, 2008b) is based on the fact that extreme

adjectives show the same entailment pattern as lower-closed scale adjectives (Rett 2008a, 2008b), as in (82). However, this is rejected as extreme adjectives are not modified by *slightly* unlike lower-closed scale adjectives, as in (83).

(81) a. #My glass is full, but it could be full**er**. (Kennedy 2007:26)

b. Godzilla is gigantic, but he could be bigg**er**. (Morzycki 2011:578)

(82) a. The floor is as dirty as the table. (Morzycki 2011:578)

entails: The floor is dirty.

b. My dog is as gorgeous as your ferret. (Morzycki 2011:578)

entails: My dog is gorgeous.

(83) a. ??Godzilla is slightly gigantic. (Morzycki 2011:578)

b. ??My dog is slightly gorgeous. (Morzycki 2011:578)

P-*ti*-P predicates in Korean show the same behaviors, as in (84)-(86), as the ones of extreme adjectives in (81)-(83).

(84) i kamca-nun cikum-to kulk-**ti**-kulk-ciman,
this potato-TOP now-ADD thick-TI-thick-but,
i-pota **te** kulk-ul swu-to iss-ess-ta.
this-than more thick-ADN way-ADD COP-PST-DECL
'This potato is really large now, but it could be larger than this'

(85) a. i kamca-nun ce kokuma-mankhum kulk-**ti**-kulk-ta.
this potato-TOP that sweet.potato-as thick-TI-thick-DECL
'This potato is as really-large as that sweet potato'
entails:
i kamca-nun kulk-**ti**-kulk-ta.
this potato-TOP thick-TI-thick-DECL

'This potato is really large'

(86) a. i kephi-nun {yakkan/cokum/salccak} {*ssu-**ti**-}ssu-ta.
this coffee-TOP {slightly/a.little/slightly} {bitter-TI-}bitter-DECL
Intended: 'this coffee is {slightly/a little/slightly} bitter'

Morzycki (2011:582f) proposes that extreme adjectives lack degree arguments on the lexically given scale (cf. 'evaluative adjectives' in Bierwisch 1989) and that they indicate the excess of 'perspective scale' – a contextually-given scale – by means of including contextually non-salient degrees from outside of the boundary (e.g. domain widening).

The comparatives of P-*ti*-P are different from ordinary comparative predicates in that they are unable to introduce states on the opposite side (e.g. *cak* 'little/small') on the scale (e.g. size) which is given by a predicate stem (e.g. *kulk* 'thick/big').

(87) a. i kamca-ka ce kulk-un kamca-pota te kulk-**ti**-kulk-ta.
this potato-NOM that thick-ADN potato-than more thick-TI-thick-DECL
'This potato is really-bigger than that big potato'

b. i kamca-ka ce cak-un kamca-pota te {??kulk-**ti**-}kulk-ta.
this potato-NOM that little-ADN potato-than more thick-TI-thick-DECL
Intended: 'this potato is bigger than that small potato'

c. i kamca-ka ce cak-un kamca-pota te cak-**ti**-cak-ta.
this potato-NOM that little-ADN potato-than more little-TI-little-DECL
'This potato is really-smaller than that small potato'

d. i kamca-ka ce kulk-un kamca-pota te {??cak-**ti**-}cak-ta.
this potato-NOM that thick-ADN potato-than more little-TI-little-DECL
Intended: 'this potato is really-smaller than that big potato'

(88) a. wusan-i ciphangi-pota te kil-**ti**-kil-ta.
umbrella-NOM stick-than more long-TI-long-DECL
'{An/the} umbrella is really-longer than {a/the} stick'

b. wusan-i ccalp-un ciphangi-pota te {??kil-**ti**-}kil-ta.
umbrella-NOM short-ADN stick-than more long-TI-long-DECL
Intended: '{an/the} umbrella is really-longer than {a/the} short stick'

c. wusan-i ciphangi-pota te ccalp-**ti**-ccalp-ta.
umbrella-NOM stick-than more short-TI-short-DECL
'{An/the} umbrella is really-shorter than {a/the} stick'

d. wusan-i ki-n ciphangi-pota te {??ccalp-**ti**-}ccalp-ta.
umbrella-NOM long-ADN stick-than more short-TI-short-DECL
Intended: '{an/the} umbrella is really-shorter than {a/the} long stick'

Both of the referents compared in the comparative construction of P-*ti*-P should be able to be predicated by P itself. For instance, the stick as well as the umbrella is really long or at least long enough in (88a); on the other hand, both are really short or at least short enough in (88c). P-*ti*-P is not likely to make a complete use of a scale which is lexically given by the predicate stem P. Furthermore, P-*ti*-P cannot indicate a relative ordering between two degrees on the scale.

Here is one more thing. Open scales have neither a maximum element nor a minimal element, so that they have a relative standard. Most P-*ti*-P constructions have a predicate stem which correspond to this open scale, but they do not show the same semantic effect of relative standard. We can examine this by means of *oxymoron*, which refers to the juxtaposition of two contradictory concepts such as *living dead*. While this phenomena is sometimes intentionally introduced as a paradox in the literature (e.g. *sweet sorrow* and *silent whistle*), it is commonly used

by changing at least one of two meanings (e.g. *circular square* and *plastic glass*). Even without changing the meaning, two contradictory concepts on the same scale in (89) do not show a paradox because they have relative standard. In (89a), the size of the little giant is relatively little among the giants. This reading is not obtained in (89b).

(89) a. kein-un khu-ta. cak-un kein-to khu-ta.
giant-TOP big-DECL little-ADN giant-ADD big-DECL
'Giants are big. Even a little giant is big, too'

b. kein-un khu-ta. {#cak-**ti**-}cak-un kein-to khu-ta.
giant-TOP big-DECL little-TI-little-ADN giant-ADD big-DECL
Intended: 'Giants are big. Even a very little giant is big, too'

Here, let us compare A-*ti*-A to another predicate reduplication A-*na*-A. First of all, they look very similar in their morphological structures.

(90) a. khu-**na**-khu-n calmos
big-NA-big-ADN mistake
'a huge mistake'

b. *ki-**na**-me-n sikan
long-NA-far-ADN time

In *The Standard Korean Dictionary* (2015), however, only four lexical entries are listed as an adjectival reduplication in the form of Predicate stem-*na*-Predicate (P-*na*-P-): *ki-na-kilta* (long), *me-na-melta* (far), *khu-na-khuta* (big), and *ha-na-hata* (many/much) (Byun 2010:478). Therefore, this pattern corresponds to a real adjective reduplication A-*na*-A.

(91) (Byun 2010:479)

a. ku-tul-un ki-**na**-ki-n yehayng-ul ttena-ss-ta.
he-PL-TOP long-NA-long-ADN journey-ACC depart-PST-DECL
'They left on a long-long journey'

b. Yengmi-nun Swumi-eykey khu-**na**-khu-n unhyey-lul ip-ess-ta.
Y.-TOP S.-dat big-NA-big-ADN favor-ACC get-PST-DECL
'Yeongmi was greatly indebted to Sumi'

Byun (2010:490) suggests that A-*na*-A expresses an emphasis of limitless infinity and explains that A-*ti*-A is more productive in the domain of abstract objects than concrete objects because the latter is easily measured in a certain way. In comparison, he also that A-*ti*-A is more productive in the domain of concrete objects than abstract objects although a transition from concrete to abstract is possible by means of semantic extension.

(92) (Byun 2010:489f)

a. kil-**ti**-ki-n {yenhyu/kolmokkil/pokto/halwu/hasoyen/kul}
long-TI-long-ADN {holidays/alley/corridor/day/complain/article}
'very long {holidays/alley/corridor/day/complain/article}'

b. ki-**na**-ki-n {pam/ipyel/ssawum/sikan/yeceng/cwumal/cangma}
long-NA-long-ADN {night/farwell/fight/time/journey/weekend/monsoon}
'very long {night/parting/struggle/time/journey/weekend/rainy season}'

c. khu-**ti**-khu-n {son/mwun/sayngsen}
big-TI-big-ADN {hand/door/fish}
'very large {hand/door/fish}'

d. khu-**na**-khu-n {unhyey/towum/saken}
big-NA-big-ADN {grace/help/event}

'very big {favor/help/event}'

However, we should consider the difference between P-*ti*-P and A-*na*-A. They differ in lexical selection. P-*ti*-P is quite productive in the domain of abstract objects in cases where the predicate stem refers to an evaluative state.

Even though a referent is in the domain of concrete objects, the property of the predicate is evaluative. For instance, color is a visible property of a physical object. Physically, there are primary colors in the domain of colors. Primary colors are the basic colors which all colors are derived from. For each color term, if it is on the scale of color and there is a maximum element on that scale, then the maximum element of color scale is a primary color. There are no more colors beyond the primary color. The maximum element on the scale introduced by *ppalkang* 'redness' is the reddest one – the primary color of red itself, that is to say, this scale corresponds to upper closed. Ironically, P-*ti*-P is fond of these kinds of primary color predicates despite its semantic condition of upper openness. Then, how can P-*ti*-P be combined with primary color predicates? P-*ti*-P with a primary color predicate stem cannot predicate the primary color itself. In (93a), *pwulktipwulkun* is not able to reach, but it does approach very close to, the maximum element of *ppalkang*. This is possible because it is on the dense scale. If it is able to keep going upward even little by little as the maximum element is still unreachable, then the scale is analogous to upper open.

(93) a. pwulk-ti-pwulk-un ppalkang
red-TI-red-ADN redness
#'highly red primary redness'
'an almost primary red in the domain of red'

b. phwulu-ti-phwulu-n phalang
blue-TI-blue-ADN blueness
#'highly blue primary blueness'
'an almost primary blue in the domain of blue'

c. nwulu-ti-nwulu-n nolang
yellow-TI-yellow-ADN yellowness
#'highly yellow primary yellowness'
'an almost primary yellow in the domain of yellow'

d. huy-ti-huy-n hayang
white-TI-white-ADN whiteness
#'highly white primary whiteness'
'an almost primary white in the domain of white'

e. kem-ti-kem-un kemceng
black-TI-black-ADN blackness
#'highly black primary blackness'
'an almost primary black in the domain of black'

In fact, it is hard to find the primary colors in the real world. Even a well-made artificial pigment hardly expresses what the primary color is, due to the surrounding environments (e.g., brightness or reflecting light). This point favors P-*ti*-P, which is unable to indicate the maximum element of primary color. An object referred to by a P-*ti*-P predicate is seldom a primary color, and sometimes it is a color similar but different color, as in (94). In this point, without restraint, P-*ti*-P expresses that the color property of object is a paragon of that color. It is certain to some extent that it is a color very close to the primary one, but not exactly same. Here, the intensity of the color is evaluative rather than measurable in that it

depends on impressions of the object as with impressionist arts.

(94) a. pwulk-ti-pwulk-un {ipswul/phi}
red-TI-red-ADN {lips/blood}
'{lips/blood} which looks almost red (not real perfect red)'

b. phwulu-ti-phwulu-n {hanul/namwu}
blue-TI-blue-ADN {sky/tree}
'{clear sky / fresh tree(s) which looks almost white (not real perfect blue)'

c. nwulu-ti-nwulu-n {hwangkum/ippal}
yellow-TI-yellow-ADN {yellow.gold/tooth}
'{goldy gold / tinted tooth} which looks almost yellow (not real perfect yellow)'

d. huy-ti-huy-n {elkwul/son}
white-TI-white-ADN {face/hand}
'pale {face/hand(s)} which looks almost white (not real perfect white)'

e. kem-ti-kem-un pampata
black-TI-black-ADN night.sea
'the night sea which looks almost black (not real perfect black)'

This is not only in the domain of color. The predicate *twungkul-ti-twungkulta* 'highly circular' works in the same way, in that it does not indicate a perfect circle.

(95) a. twungkul-ti-twungku-n tongkulami
circular-TI-circular-ADN circle
Intended: 'very circular circle'

b. twungkul-ti-twungku-n {elkwul/tal}
circular-TI-circular-ADN {face/moon}
'{a face/the moon} which looks almost circular (not a real perfect circle)'

Then, what is the evaluative meaning of P-*ti*-P? We have already mentioned that when P-*ti*-P is combined with predicate stems of dimensional states, it does not show the same behavior as that predicate stem in terms of positive and comparative readings. P-*ti*-P does not make full use of the scale of an attribute lexically given by the predicate stem. For example, *khuta* 'big' introduces the scale of size. There is no degree on this scale which is not able to be denoted by *khuta*. It is because the standard is relatively determined depending on the context. A certain degree is in the denotation of *khuta* in some cases, but is not in other cases. The relative standard of comparison of P-*ti*-P does not seem to be as relative as the original version of the predicate stem. *khutikhuta* 'big-TI-big' hardly denotes the degrees on the lower side of scale. This is more obvious especially in cases where those degrees are in the denotation of antonym at the same time, as in (87) and (88). An object can be large and at the same time small in cases where it is compared to two different standards of comparison.

However, for P-*ti*-P, an object which is P-*ti*-P is constantly P; P-*ti*-P is not favorable in cases where it is possible that the object could be not-P in comparison with some standard of comparison. An 'intensive' reading indicated by P-*ti*-P is that the degree of the object is obviously in the denotation of the predicate stem P through the cases: 'in any case, it is P'. This is not a superlative reading. It does not need to be 'the largest super potato in the world', which is a maximal element in the restricted domain. Also, P-*ti*-P is not really a limitless infinite reading. P-*ti*-P can refer to 'potato' which has a usually observed size only if it is considered as big in all of those usual cases. Then, we can assume that the domain of P-*ti*-P consists of degrees that are beyond all the standards in cases. As in Figure 4, there are

mappings from the domain of cases (D_{case}) to the domain of standards of comparison ($D_{Standard\ of\ Comparison}$), and there are mappings from the domain of standards of comparison to the domain of degrees of attribute P ($D_{Attribute\text{-}P}$; e.g. size or length). Both $D_{Standard\ of\ Comparison}$ and $D_{Attribute\text{-}P}$ are in order on the scale. The big arrow area with the dashed line on top of $D_{Attribute\text{-}P}$ corresponds to the denotation of P-*ti*-P. The lower bound in the denotation of P-*ti*-P may be not extremely high as long as it is beyond all the standards of comparison in cases.

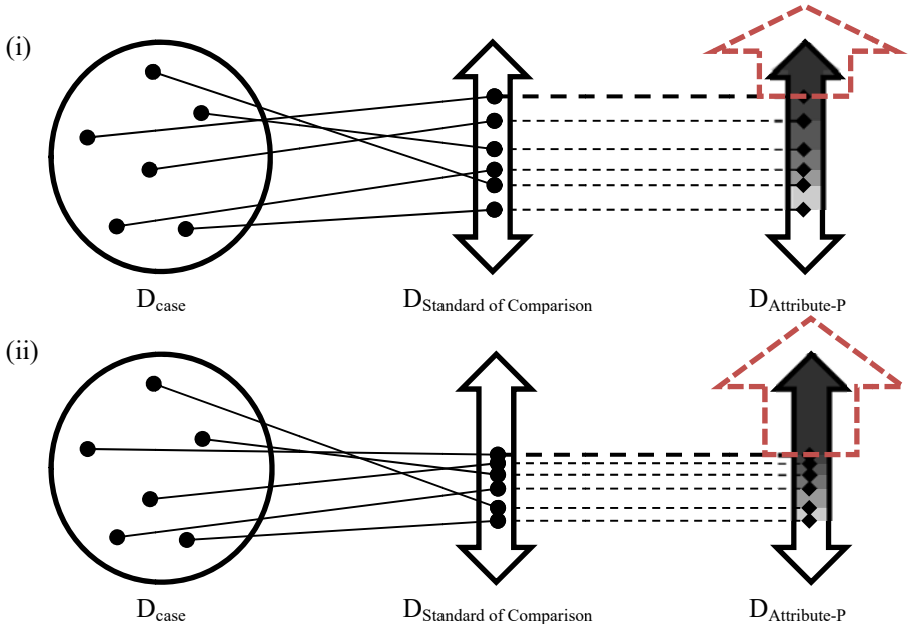

Figure 4. Mapping Relations of P-*ti*-P (I)

6 Extended Pluractionality

This chapter provides a unified analysis on pluractional phenomena introduced in the preceding chapters.

6.1 Internal Pluractionality

In this section, we evaluate the characteristics of event-internal pluractionality in comparison with our research results and then discuss the distinction between event-external and event-internal pluractionality.

6.1.1 Review of Characteristics of Event-Internal Pluractionality

(1) Characteristics of Event-Internal Pluractionality (Henderson 2012)

a. Aspectual selection for semelfactives and achievements

b. Contiguous repetition

c. One occasion

d. High cardinality

e. Shared telos or theme

f. Failed entailments to the base predicate

(a) ***Aspectual selection for semelfactives and achievements.*** We have shown a number of aspectual selections. However, the selected aspectual classes are not totally restricted to semelfactives and achievements. Moreover, what is really selected by pluractional markers is not exactly matched to a certain aspectual class.

(2) a. cali-ka {ta-tal-i/na-nal-i/halwu-halwu}
seat-NOM { month-month-ADV /day-day-ADV/1day-1day}
(te) **ttattushay-cy**-ess-ta.
(more) warm.become-PST-DECL
'The seat became warmer {month by month/day after day/(from) day to day}'

b. Mina-ka {ta-tal-i/na-nal-i/halwu-halwu}
M.-NOM {month-month-ADV/day-day-ADV/1day-1day}
cali-lul **te** **ttattushan** kos-**ulo** olmky-ess-ta
seat-ACC more warm place-DIR move-PST-DECL
'Mina moved her seat to a warmer place month by month'

Pluractional adverbs *ta-tal-i* 'month by month', *na-nal-i* 'day after day' and *halwu-halwu* '(from) day to day' have a tendency to appear with degree-achievement predicates or eventive comparative constructions; at the same time, these adverbs differ from other types of modified predicates. The conditions of adverbs on events are specified by means of some properties clarifying the environments: the BOUNDEDNESS condition of *tatali* is non-S-cumulative and non-divisive events; the SCALAR CHANGE condition of *nanali* is events with a strictly linear-ordered set, whose members are irreflexive, asymmetric, and connected; and the DIVISIVE condition of *halwuhalwu* is a cumulative and divisive event. On the basis of these conditions, we propose that degree-achievements are targeted by the three adverbs for different reasons.

(3) a. **Activity with MP**
Mina-ka ta-tal-i **sip khillomithe**-lul tally-ess-ta.
M.-NOM month-month-ADV 10 km-ACC run-PST-DECL
'Mina ran 10km per month (lit. Mina ran 10km month by month)'

b. **State with a Scalar Phase**

Mina-ka na-nal-i (te) **simhakey** alh-ass-ta.

M.-NOM day-day-ADV more seriously be.ill-PST-DECL

'Mina got **more** seriously ill day after day'

c. **Homogeneous Activity**

Mina-ka halwu-halwu **kitaly**-ess-ta.

M.-NOM 1day-1day wait-PST-DECL

'Mina waited (from) day to day'

As for -*keli*-, -*tay*-, and V-*e tayta*, this characteristic works as the REPEATABILITY condition. Here, we can see that this selection is actually not restricted to aspectual properties, in some examples of -*keli*- and -*tay*-. Roots compatible with two affixes are REPEATABLE in a variety of domains – time, space, and entity. Some roots do not even have an event to be repeated and have only a repeatable shape, which is in the spatial domain.

(4) REPEATABILITY: there is a cumulative and non-divisive pattern.

a. pyelpich-i **panccak**-{**keli/tay**}-ess-ta.

starlight-NOM twinkling-{KELI/TAY}-PST-DECL

'A star twinkled'

b. konghang-i yehayngkayk-ulo **pwukcek**-{**keli/tay**}-ess-ta.

airport-NOM tourist-INSTR crowded-{KELI/TAY}-PST-DECL

'The airport was crowded with tourists'

c. kkepcil-i **ccwukul**-{**keli/tay**}-ess-ta.

skin-NOM wrinkled-{KELI/TAY}-PST-DECL

'The peel was wrinkled'

This kind of selection appears in the -*ti*- constructions, which have only an

upper-open scalar predicate among the stative predicates, i.e. without an event argument but with a degree argument.

(5) a. nolay-ka sulphu-**ti**-sulphu-ta.
song-NOM sad-TI-sad-DECL
'The song is so sad'

b. ne-nun {*yecenha-**ti**-}yecenha-ta.
you-TOP still.the.same-TI-still.the.same-DECL
Intended: 'You are really still the same as before'

b. moca-lul {*pantusha-**ti**-}pantusha-ke ssuta
hat-ACC straight-TI-straight-ADV put.on
Intended: 'to put one's hat on straight'

(b) *Contiguous repetition* and (c) *one occasion*. The connectedness of the covers of the whole is the main criterion in classifying pluractional markers as event-internal pluractionals. This characteristic is well-observed in the suffix *-tay-*. *-tay-* has a fuzzy boundary among the covers whether covers specified by a root are heterogeneous or not. The fuzziness is guaranteed by aid of contiguous repetition. If covers are located far from one another, they are easier to recognize as an independent unit even though they have no boundary.

(6) a. cenkwu-ka kkampak-**tay**-ss-ta.
light.bulb-NOM flickering-TAY-PST-DECL
'{A/The} light bulb flickered'

b. light [$_{e1}$ on-off~on~~~on-off-on~on-off~on-off-on]

Likewise, the characteristic of *one occasion* follows with contiguity. Recall the

two types of readings from *-tay-*: '*Do not just end at the end point! Restart immediately!*' and '*Keep on doing it with no end!*.' The latter is contiguous repetition; the former is multiplicity in one occasion.

(7) Mina-ka cip-ul ci-e tay-ess-ta.
M.-NOM house-ACC build-CONJ REPETITIVE-PST-DECL

(i) 'Mina kept building houses'
[…house~house~house~house…]

(ii) 'Mina kept building a certain house'
[…$wall_1$~door~floor~$wall_2$~windows~roof…]

As for three temporal adverbs, covers of changes with *nanali* and *halwuhalwu* seem to follow these characteristics. *halwuhalwu* even has a continuous interpretation, which could be an extreme version of contiguity. In contrast, a repetitive reading from *tatali* consists of definitely intermittent covers. It takes approximately a month to repeat. However, the unit nouns *tal* 'month', *nal* 'day', and *halwu* 'one day' of *tatali*, *nanali*, and *halwuhalwu* specify the type of cover in the time domain. They always denote a sequence of adjacent time units (like […, January, February, March, April, …]; unlike […, January, April, October, December, …]). In the whole time interval, the temporal covers are adjacent on the temporal axis.

(8) a. Mina-ka ta-tal-i cali-lul olmky-ess-ta.
M.-NOM month-month-ADV seat-ACC move-PST-DECL
'Mina moved her seat month by month'

b. saykkkal-i na-nal-i pakkwuy-ess-ta.
color-NOM day-day-ADV be.changed-PST-DECL

'The color changed gradually day by day'

c. Mina-ka halwu-halwu kitaly-ess-ta.
M.-NOM 1day-1day wait-PST-DECL
'Mina waited (from) day to day'

P-*ti*-P does not apply here as it does not introduce an event argument.

(d) *High cardinality*. The characteristic of high cardinality shows effects to increase the contiguity of covers and block recognizing the atomicity when it is applied to covers in the limited space.

(9) a. konghang-i yehayngkayk-ulo **pwukcek-tay**-ess-ta.
airport-NOM tourist-INST crowded-TAY-PST-DECL
'The airport was crowded with tourists'

The interpretation '*Keep on doing it with no end!*' of V-*e tayta* is associated with high cardinality as well as high speed / high intensity, especially when the ongoing time of the preparatory process is so short that the activity restart point returns swiftly.

(10) a. Mina-ka cip-ul **cengsinepsi** ci-e tay-ess-ta.
M.-NOM house-ACC frantically build-CONJ REPETITIVE-PST-DECL
'Mina kept building {a house/houses} frantically'

b. Mina-ka cip-ul **hetwungcitwung** ci-e tay-ess-ta.
M.-NOM house-ACC in.a.tearing.hurry build-CONJ REPETITIVE-PST-DECL
'Mina kept building {a house/houses} in a tearing hurry'

(11) a. Mina-ka cip-ul (??**chapwunha-key**) ci-e tay-ess-ta.
M.-NOM house-ACC calm-ADV build-CONJ REPETITIVE-PST-DECL

'Mina kept building {a house/houses} (??calmingly)'

b. Mina-ka cip-ul (??**chakunchakun**)
M.-NOM house-ACC in.a.calm.and.orderly.way
ci-e tay-ess-ta.
build-CONJ REPETITIVE-PST-DECL
'Mina kept building {a house/houses} (??in.a.calm.and.orderly.way)'

Furthermore, covers of high cardinality sometimes emerge as *countless*, *innumerable*, or *immeasurable*.

(12) a. ku-tul-un ki-**na**-ki-n yehayng-ul ttena-ss-ta.
he-PL-TOP long-NA-long-ADN journey-ACC depart-PST-DECL
'They left on a long-long journey'

b. Yengmi-nun Swumi-eykey khu-**na**-khu-n unhyey-lul ip-ess-ta.
Y.-TOP S.-dat big-NA-big-ADN favor-ACC get-PST-DECL
'Yeongmi was greatly indebted to Sumi'

Moreover, covers of high cardinality are really *countless*, *innumerable*, and *boundless* in that the whole of event-internal pluractionality is unbounded. As for *tatali* and *nanali*, each cover is bounded but the whole event is unbounded. As for *halwuhalwu*, both the whole event and its covers are unbounded. In summary, *tatali*, *nanali*, and *halwuhalwu* share the characteristic that the whole event is unbounded.

As for -*e tay*-, each cover can be bounded but the whole event is unbounded.

(13) Mina-ka sip khillomithe*(-**ssik**) talli-e tay-ess-ta.
M.-NOM 10 kilometer-DSH run-CONJ REPETITIVE-PST-DECL
'Mina kept running 10 kilometers *(at a time)'

(e) ***Shared telos or theme.*** Each adverb selects a cover from its own domain and pluralizes it so that the subparts of the whole event are connected through all the temporal intervals, which results in a regularly repetitive reading of *tatali*, an (forced) incremental reading of *nanali,* and a continuative reading of *halwuhalwu*.

(14) a. saykkkal-i na-nal-i pakkwuy-ess-ta.
color-NOM day-day-ADV be.changed-PST-DECL
'The color changed gradually day by day'

b. Mina-ka halwu-halwu kitaly-ess-ta.
Mina-NOM 1day-1day wait-PST-DECL
'Mina waited (from) day to day'

(f) ***Failed entailments to the base predicate.*** This characteristic is controversial in that some event-internal pluractionals do not entail the base predicate but other event-internal pluractionals do (cf. Součková 2011). *-tay-* and V-*e tayta* show both sides in their interpretation of '*Keep on doing it with no end!*' and '*Do not just end at the end point! Restart immediately!*' We ascribe these two interpretations to the difference between complexity and multiplicity: heterogeneous cover vs. (natural-) atomic cover.

(15) Mina-ka cip-ul ci-e tay-ess-ta.
M.-NOM house-ACC build-CONJ REPETITIVE-PST-DECL

(i) 'Mina kept building houses'
[…house~house~house~house…]

(ii) 'Mina kept building a certain house'
[…$wall_1$~door~floor~$wall_2$~windows~roof…]

This is related to the imperfect paradox. An accomplishment in the progressive form fails to entail its perfect form because it is on its preparatory process, and the transition has not yet occurred. Likewise, in the case of complexity, only the preparatory process of the accomplishment activates and there is no transition; therefore, an entailment to the base predicate fails. On the other hand, multiplicity grants the entailment.

6.1.2 Internal plurality

As for pluractional phenomena, the distinction between event-internal and event-external pluractionality has been discussed on the presupposition of the presence of the event. However, as shown through our data, some pluractional markers yield the readings where events are not involved, but these readings are still along with the characteristics of 'event-internal pluractionality'. The kind of external/internal distinction that does not depend on pluralized (sub)events is presented through some phenomena reported as 'Internal plurality' (Součková 2011:115) and 'Internal localization' (Todaro and Villoing 2012).

Součková (2011:150) represents two less typical cases of 'anchoring' for pluractionality in Hausa. The first type of case is (16), which is proposed to be classified into cases of anchoring through participants. The second type of case in (17) has different types of sources or reasons for the psychological experiences. We underline and pay attention to the parts of meanings. Součková (2011:150) regards (16) as anchoring through participants, but we can read more in the interpretations. In (16a), the reduplication *yiy-yi* 'do-do' (barely manages to) expresses a distinction among resemblance relations by means of differing degrees. Likewise,

in (16b), the reduplication *gàg-gàji*'be.tired-be.tired' also (barely manages to) expresses a distinction among tiresome states by means of differing reasons.

(16) Hausa (Součková 2011:150)[37]

a. %Yâransù sun **yiy**-yi kàmaa dà bàabansù
children.their 3PL.PF RED-do resemblance with father.their
'Their children resemble their father to various degrees'

b. %Mun **gàg**-gàji
1PL.PF RED-be.tired
'We are (all) tired for different reasons'

(17) Hausa (Součková 2011:151)

a. %Naa **yày**-yaɗà dà shii
1SG.PF RED-trust with him
'I trust him totally/in everything'

b. %Yaa **rur**-rùuɗee
3SG.M.PF RED-be.confused
'He was so confused/repeatedly confused' (about many things)

These kinds of anchorings make use of an additional meaning component which is introduced from the contexts, which is similar to the *complexity from heterogeneity* readings of verbal suffixes *-keli-* / *-tay-* and verbal complex V-*e tayta* in Korean. The sentence in (18a) becomes better in contexts where the procedure of the house-building motion is highlighted; moreover, this is more effective especially when sub-motions are distinguished from each other in an obtrusive way.

[37] PF: perfective TAM

This is identified by means of manner adverbs such as *makwucapilo* 'at random' in (18b) and *tulccwuknalcwukhakey* 'jaggedly / uneven' in (18c).

(18) a. ??Mina-ka ku cip-ul ci-e tay-ess-ta.
M.-NOM that house-ACC build-CONJ REPETITIVE-PST-DECL
'Mina kept building that house'

b. Mina-ka ku cip-ul **makwucapilo** ci-e tay-ess-ta.
M.-NOM that house-ACC at.random build-CONJ REPETITIVE-PST-DECL
'Mina kept building that house indiscriminately'

c. Mina-ka ku cip-ul **tulccwuknalcwukhakey**
M.-NOM that house-ACC jaggedly
ci-e tay-ess-ta.
build-CONJ REPETITIVE-PST-DECL
'Mina kept building that house uneven'

Introducing an additional meaning component by an adjunctive modifier or from the context will be dealt with again in Section 6.3.1.

Meanwhile, Todaro and Villoing (2012) introduce the *Internal localization* phenomenon of NN > Adv reduplication in Sicilian, as in (19). The notion of internal localization refers to "a specific meaning expressing internal location."

According to Todaro and Villoing (2012), NN > Adv reduplication expresses a localization relation between a *landmark* and a *trajector* (Talmy 1983, 1985; Langacker 1987). The reduplicated noun provides a landmark (anchoring entity). In general, the trajector (an entity to be located) moves *within* the boundaries of the landmark, so that its trajectory is also located *within* the boundaries. Therefore, this relationship between a landmark and a trajector is *internal* localization (cf.

Aurnague 1996, 1997).

(19) Internal localization

a. [[miccato]$_N$-[miccato]$_N$]$_{Adv}$ (Todaro and Villoing 2012:177f)

market-market

'at the market, in the market, moving in the market'

Context:

Ti	ciccava	miccato-miccato
refl	search.ipfv.1SG	market-market

'I looked for you in the market / everywhere in the market'

b. [[casa]$_N$-[casa]$_N$]$_{Adv}$ (Todaro and Villoing 2012:180)

house-house

'at home, in the house, inside the house'

Internal localization works only as spatial distribution, which does not require other types of distributions such as temporal distribution and participant-based distribution. Moreover, the internal localization works regardless of the presence of the event. These reduplicative adverbs yield not only *dynamic* internal localization (i.e. the dynamic interpretation involving the trajector's movement in the location, as in (20a)) but also *static* internal localization ('vague localization' in (20b), 'incongruity/inappropriateness of the trajector's presence' in (20c) and 'homogeneous distribution' in (20d, e)).

(20) Sicilian (Todaro and Villoing 2012:182-5)

a.

U	picciriddro	ioca	**casa-casa**
DET	child	play.3SG	house-house

'The child plays <u>at</u> home<u>, all over</u> the house'

b. Petru si cuccao **voscu-voscu**

Peter REFL lie.down.PST.3SG forest-forest

'Peter is lying down (somewhere) in the forest'

c. Petro è assittato **casa-casa**

Peter be.3SG sitting house-house

'Peter is sitting in the middle of the house'

(only acceptable if Peter is in the way, blocking the passage)

d. U fangu è **muru-muru**

DET mud be.3SG wall-wall

'The mud is (spattered) all over the wall'

e. L' aceddri sunnu **corda-corda**

DET bird.PL be.3PL wire-wire

'The birds are sitting along the wire'

The more interesting thing is that external-counterpart reduplication exists. In cases where noun reduplication is made by a noun inflected for plural number, it has the meaning of 'from N to N'. Then, a movement occurs across different *N*s, as in (21).

(21) External localization

a. $[[casi]_N\text{-}[casi]_N]_{Adv}$ (Todaro and Villoing 2012:180)

house.PL-house.PL

'from house to house'

Context:

Vinni i so cosi firriannu casi-casi

sell.3SG DET POSS thing.PL go.PROG house.PL-house.PL

'He sells things going from house to house'

In addition, here is another reduplication of plural nouns. This pattern forms adjectives. These adjectives express the stative meaning all over the locations: '*N*s are distributed all over the area', as in (22).

(22) Noun reduplication forming adjectives: NplNpl>A

a. [['mpuddri]$_N$-['mpuddri]$_N$]$_A$ (Todaro and Villoing 2012:177f)

pimple.PL-pimple.PL

'pimply'

Context:

Avi	a	facci	'mpuddri-'mpuddri
have.3SG	DET	face	pimple.PL-pimple.PL

'His face is pimply'

In Korean, the predicate *huykkus-kelita* 'to be grizzled' in (23) does not indicate any motion or change-of-state. The predicate is used to refer to the state of hair. What the suffix *-keli-* does as a pluractional is to activate spatial distribution. *huykkus-kelita* in (23) refers to a meaning that the hair is greyish in patches; some parts of hair turn grey but other parts still remain non-grey. The difference in color results from recognition of spatial division in the hair on one person's head.

(23)

nai-ka	tul-e	melikhal-i	**huykkus-keli**-ko
age-NOM	get-CONJ	hair-NOM	grizzled-KELI-and
		cwulumsal-i	sayngki-ess-ta.
		wrinkles-NOM	be.formed-PST-DECL

'While getting older, the hair was greyish and wrinkles were formed'

To summarize, the readings which are not based on an event also show the internal/external distinction. Describing the internal/external distinction on the

basis of the event is only part of the whole pluractional phenomena; in this regard, this thesis suggests the introduction of an extended version of 'internal pluractionality' and 'external pluractionality' across various semantic domains.

6.2 X-based Pluractionality: the Cumulativity Account

This section discusses the core trait of pluractionality across various semantic conditions and interpretations.

6.2.1 The Types of Pluractional Functions

This thesis has so far introduced various types of semantic conditions and interpretations which are observed in different pluractional constructions. These are summarized as a pair-list of domain (input conditions) and range (output readings) of pluractional functions, as in (24)-(26).

(24) Reduplicative adverbs: <Input, Output>

a. *tatali* 'month by month':

<cumulative & non-divisive & non-S-cumulative & dynamic, REPETITIVE>

<cumulative & non-divisive & non-S-cumulative & dynamic & change-of-degree value, INCREMENTAL>

b. *halwuhalwu* '(from) day to day':

<cumulative & divisive & dynamic, CONTINUATIVE>

<cumulative & divisive & dynamic & change-of-degree value, INCREMENTAL>

c. *nanali* 'day after day':

<cumulative & dynamic & change on a strict linear order, INCREMENTAL>

(25) Verbal derivational suffixes and Auxiliary verb: <Input, Output>

a. *-keli-*

<cumulative & non-divisive & natural-atomic, SINGLE/REPEATED>

<cumulative & non-divisive & non-natural-atomic, REPETITIVE>

b. *-tay-*

<cumulative & non-divisive, REPETITIVE>

c. *-e tay-*

<cumulative & non-divisive & dynamic, REPETITIVE & INTENSIVE>

(26) Predicate reduplications: <Input, Output>

a. P-*ko* P 'P *and* P'

<cumulative & non-divisive & S-cumulative & dynamic, DURATIVE>

<cumulative & non-divisive & non-S-cumulative & dynamic, REPEATED>

<cumulative & divisive & dynamic, CONTINUATIVE>

<cumulative & dynamic & changes-of degree value, INCREMENTAL>

<cumulative & divisive & degrees, INTENSIVE>

<cumulative, ARGUMENT PLURALITY>

b. P-*ti*-P 'P-TI-P'

<stative & cumulative on degrees, INTENSIVE>

Upon examination of different semantic conditions, a common cumulative property appears. As for reduplicative adverbs in (24), the common property is summarized as *connectedness* between two immediately adjacent covers, which is realized in the domain of time, event, (and degree). First, this property works on the temporal structure provided by reduplications of *tal* 'month', *nal* 'day', and

halwu ‘one day’ respectively.

(27) (In the context that the festival is held only on January, April, October, and November,)

a. # Mina-nun ta-tal-i chwukcey-ey ka-ss-ta.
M.-TOP month-month-ADV festival-LOC go-PST-DECL
‘Mina went to the festival at least once a month for several successive months’

b. Mina-nun kak tal-ey chwukcey-ey ka-ss-ta.
M.-TOP each month-LOC festival-LOC go-PST-DECL
‘Mina went to the festival at least once at each month’

Second, connectedness works on the path structures provided by the sentences modified *tatali* ‘month by month’, *nanali* ‘day after day’, and *halwuhalwu* ‘(from) day to day’. The tracks of event correspond to proper subpaths consisting of a single path. Along with the time flow, a path of event is extended.

(28) If a covering event is a change of X from a_X to b_X, the immediately following event is a change of X from b_X to c_X.

X in a change of X is replaced for state, location, or possession, as in (29). The identical change of X from a_X to b_X does not occur in a row, as in (30).

(29) a. Change of state (degree, size, color, etc.)
b. Change of location
c. Change of possession

(30) a. ?? Mina-ka na-eykey ku panci-lul ta-tal-i cwu-ess-ta.
M.-NOM 1sg-DAT that ring-ACC month-month-ADV give-PST-DECL
‘Mina gave me that ring at least once a month for several successive months’

b. A covering event is a change of possession from a_X to b_X, but the immediately following event is the identical change of possession from a_X to b_X. The covers are not connected.

(31) a. Mina-ka na-wa ku panci-lul
M.-NOM na-CORNT that ring-ACC
ta-tal-i cwu-ko pat-ko hay-ss-ta.
month-month-ADV give-and receive-and do-PST-DECL
'Mina did a give-and-take that ring with me at least once a month for several successive months'

b. A covering event is a change of possession from a_X via b_X to a_X, and the immediately following event is a change of possession from a_X via b_X to a_X as well.

As for verbal derivational suffixes and the auxiliary verb in (25), the common property is summarized as *repeatability*. With actions or states with a rythmical pattern, connectedness works on the spatial structure provided by a base predicate, as in (33). For instance, the tracks of subevents correspond to the identical trajectory.

(32) If a covering event has a sequence from a_X via b_X to a_X, then the immediately following event has a sequence from a_X via b_X to a_X as well.

(33) a. ?? Mina-ka na-eykey ku panci-lul cwu-e tay-ss-ta.
M.-NOM 1sg-DAT that ring-ACC give-CONJ REPETITIVE-PST-DECL
Intended: 'Mina kept giving me that ring'

b. A covering event is a change of possession from a_X to b_X, but the immediately following event is the identical change of possession from a_X to b_X. The covers are not connected.

As for predicate reduplications in (26), both P-*ko* P 'P and P' and P-*ti*-P 'P-TI-P' are defined under the notion of cumulativity. Unlike P-*ti*-P, the P-*ko* P construction shows a naive restriction to lexical selection; in addition, it reflects the semantic properties of input into output interpretations. For this reason, P-*ko* P shows various types of interpretations based on a variety of base predicates.

All things considered, P-*ko* P expresses extended meanings on time intervals, spaces, events, participants, and degrees, which is based on the cumulativity in each domain. In a durative/continuative reading, the length of events is extended as the whole length of the time intervals is extended. In a repeated reading, the number of events is extended as the whole length of the time intervals is extended. In an incremental reading, the amounts of both events and degrees are extended as the whole length of the time intervals is extended. In an intensive reading, the magnitude of degrees is extended. In an argument-plurality reading, the number or amount of entities is extended. Therefore, as for non-gradable states and single-occurrence events, argument plurality acts as a last resort to rescue this *extendability* of P-*ko* P. This says that although the predicates have nothing special to extend the event/state, but they still have a predicated argument. Then, P-*ko* P makes use of the plurality of participants in order to show that something is extended.

6.2.2 Pluractional Readings from Degree-achievements

Degree-achievement predicates can be related to all the domains of event, time, degree, space, and entity.

They satisfy both of the domain restrictions of *tatali* 'month by month' and

halwuhalwu '(from) day to day'. However, *tatali* requires the predicate to be bounded, which is non-S-cumulative and non-divisive. On the other hand, *halwuhalwu* requires the predicate to be cumulative and divisive. Despite these differences, both of the two adverbs yield incremental readings.

(34) a. *tatali* 'month by month':
<cumulative & non-divisive & non-S-cumulative & dynamic & change-of-degree value, INCREMENTAL>

b. *halwuhalwu* '(from) day to day':
<cumulative & divisive & dynamic & change-of-degree value, INCREMENTAL>

c. *nanali* 'day after day':
<cumulative & dynamic & change on a strict linear order, INCREMENTAL>

As for *nanali*, it even forces a non-scalar predicate to turn into scalar by aspect coercion. Even in combination with a non-gradable predicate *pakkwuyta* 'change', the sentence with *nanali* is true only in the context where members of colors are connected in an order and members that have appeared before do not appear again.

(35) saykkkal-i na-nal-i **pakkwuy**-ess-ta.
color-NOM day-day-ADV change-PST-DECL
'The color changed gradually day after day'

This context corresponds to a strictly linear-ordered set, i.e. scale, in which members are irreflexive, asymmetric, and connected.

As for P-*ko* P, incremental readings are obtained in cases where the predicate of event refers to change-of-degree.

(36) P-*ko* P 'P *and* P':

<cumulative & dynamic & change-of-degree value, INCREMENTAL>

P-*ko* P yields incremental readings in combination not only with degree-achievements (37a), but also with derived change-of-degree events (37b).

(37) a. cwuka-ka olu-**ko (tto)** oll-ass-ta.
stock.prics-NOM increase-and (again) increase-PST-DECL
'The stock price increased and increased'

b. salam-tul-nun teyipul-ul te meli olmki-**ko (tto)** olmki-ess-ta.
person-PL-TOP table-ACC more far move-and (again) move-PST-DECL
'People moved a table farther and farther'

(38) a. *P-*ko* P
with degree-achievements with specific degrees

According to Piñón (2008), whether the predicate is cumulative or non-cumulative can be determined based on the setting of existential closure. When an introduced variable is not existential-closed, it is eliminated or set with the different values given from the context. Here, degree-achievement predicates can be switched as either cumulative or non-cumulative. The sum of '3 degrees increase' and '3 degrees increase' is '6 degrees increase', not '3 degrees increase'; on the other hand, the sum of 'the temperature increases' and 'the temperature increases' results in 'the temperature increases' in cases where 'the temperature' indicates an identical value. The latter is cumulative and divisive in its part-whole structure: for an event, both the sum of the events and a part of the event has the same properties as the event. The changes sometimes occur at a distance of time but sometimes do not. P-*ko* P with degree-achievement in (39) yields only an incremental reading,

not a repeated reading.

(39) a. amwuli mwul-ul ppwuli-ko hay-e po-ato,
however water-ACC sprinkle-and do-CONJ try-CONC
matang-un ttukeweci-**ko** **tto** ttukewecy-ess-ta.
yard-TOP become.hot-and again become.hot-PST-DECL
'In spite of trying by sprinkling water, the yard became hotter and hotter'

P-*ko* P with degree-achievement in (40) yields not an incremental reading, but a repeated reading or an emphasis.

(40) a. cwuka-ka choykochi-ey olu-**ko** oll-ass-ta.
stock.prices-NOM maximum-LOC increase-and increase-PST-DECL
'The stock increased to the maximum value' (repeatedly / obviously)

P-*ko* P with degree-achievement in (41) yields neither an incremental reading nor a repeated reading. Here, event plurality is obtained by means of argument plurality.

(41) a. **onkac** kwamok-eyse olu-**ko** ol-un sengcek-ulo
all.kinds.of subject-LOC increase-and increase-and score-INST
hapkyekha-yss-ta
pass-PST-DECL
'[Someone] passed the exam with the scores increased in all sorts of subjects'

The common meaning of P-*ko* P is invoked as *extendability*. If x is increased by some operation O and x is arranged in a line y, the result of x is extended along the line y. As for time intervals, it could be a sum of time intervals neighboring each other, e.g. an extended time interval. As for entities of participants, it could be a

number of members in a group. Then, as for degrees, it could be a sum of degrees neighboring each other, e.g. an extended degree. For these, by mean of the base predicates, P-*ko* P introduces arguments satisfying a certain common property: cumulativity. The cumulativity is obeyed by an argument which is extended (e.g. participating in pluralization). This argument is possibly provided from all over the domains of entity, event, time, space, degree, etc.

6.2.3 *n*-dimensional Pluractionality

Pluractionality is similar to cumulativity in some areas, and to distributivity in other areas. Cumulativity has no quantificational force, as in (42a). There are two sums; one is a sum of temporal intervals and the other is a sum of events. Every atom of one sum is mapped to at least one atom of the other sum. On the other hand, distributivity in the traditional sense has a quantificational force, as in (42b). Every atom of some given sum of a temporal interval has a certain relation with an event. While both pluractionality and cumulativity require two sums, pluractionality corresponds to cumulativity by specifying the relation between two sums as one-to-one mapping.

(42) Five men lifted two pianos. (Sternefeld 1998 :312)

a. $(\exists X)$ (**five**$(X) \wedge$ ***man**$(X) \wedge (\exists Y)$ (**two**$(Y) \wedge$ ***piano**$(Y) \wedge \langle X, Y\rangle \in$ **λ xy[**lift**(x, y)]))

b. $(\exists X)$ (**five**$(X) \wedge$ ***man**$(X) \wedge (\exists Y)$ (**two**$(Y) \wedge$ ***piano**$(Y) \wedge X \in$ *λx[$Y \in$ *λ y[**lift**(x, y)]]))

Brasoveanu and Henderson (2009) also presents a formula for *one by one* that

resembles cumulativity in large part; however, they focus on the clause specifying the relation between two sums and propose that *one by one* is another kind of distributivity, which is distinguished from the distributivity of *each*. This property seems to be similar to binary quantifiers (van Benthem 1989; Nam 2005), which take a relation as input and then assign a truth-value.[38] They are not reducible to unary quantifiers.

This accounts for the differences between pluractional adverbs (*tatali*, *nanali*, *halwuhalwu*) and quantificational adverbs (*maytal* 'every month' and *mayil* 'every day'). For example, the type of repetition derived from pluractional adverb *tatali* is different from a repeated interpretation of *mayil*. While a repetitive reading from *tatali* refers to the existence of plurality and the subparts of the whole event are all connected, a repeated interpretation which results from *mayil*'s quantification is not acquired by means of defining the existence of plural events and a connection among atomic events by default. Moreover, the incremental reading with *mayil* and the indefinite durative scalar change is selected by a pragmatic inference from a number of situations satisfying the repeated reading. The resultant reading meets an incremental context by chance due to the type of input predicate. These pluractional adverbs have the requirement of the property *indefiniteness* on their semantic domain in common.

We propose the semantic derivation of two-dimensional pluractionality of

[38] Branching quantifiers (Barwise 1979) make a scopeless quantification. For example, the sentence *no boy likes no girl* is interpreted in two ways: (i) a salient reading 'there is no pair where some boy likes some girl', and (ii) a marginal reading 'there is no boy who likes no girl'. The reading (i) corresponds to a branching quantifier.

temporal pluractionality and degree-based pluractionality. In this context, the aforementioned contrast between incrementality and distributivity is possible to be explained through the mathematical structure. The latter type of pluractionality is one-dimensional; the former type is multidimensional. One-dimensional pluractionality is usual; however, some expressions such as *nanali* require multidimensional pluractionality in nature and are irreducible to one-dimensional pluractionality.

Furthermore, pluractional operators are identified with the type of cumulation operators which contain the type of event/situation v in the n-tuple of argument(s) – v, $\langle \alpha, v \rangle$, $\langle \alpha, \beta, v \rangle$, $\langle \alpha, \beta, \ldots, v \rangle$. N-dimensional pluractionality can be reduced to $(N+1)$-dimensional plurality, which contains arguments from more than one domain. Temporal pluractionality is one-dimensional pluractionality, but two-dimensional plurality in that the cumulation operator targets the temporal domain and the event domain for its two arguments. Note that this *n-dimensional* plurality is different from *n-ary* plurality derived from an n-place cumulation operator. The latter is determined by the number of arguments required by the cumulation operator; the former by the number of the types of arguments of the cumulation operator. For example, $\langle e, \langle e, t \rangle \rangle$ pluralization corresponds not only to binary (cumulative) pluralization with a two-place cumulation operator, but also to one-dimensional plurality only with the domain of individuality.

Furthermore, for n-dimensional plurality, a plural operator is applicable across various domains. For example, in cases where temporal cumulativity is not introduced lexically or contextually, plurality of another argument is required. It can be solved by making use of cumulativity of plural entity which is introduced by

a participant argument. In other words, cumulativity across various domains can be utilized. In this regard, intensification is possibly regarded as a result when the same procedure is applied into the domain of degree as well.

6.3 Scalar Pluractionality

We introduce degree-based pluractionality in order to include degree-based readings (e.g. incrementality and intensification). We have already shown the validity of degree-based pluractionality in dealing with an incremental reading of *nanali* in Chapter 3.

Like reduplication in adverbs *tatali* 'month by month', *nanali*, 'day after day', and *halwuhalwu* '(from) day to day', reduplications of predicate work as a cue for introducing a pluralizing operation. But what is important in the reduplication of stative predicates is the fact that there is no event argument and that there should be at least one argument for pluralization. As for scalar predicates, they have a degree argument. Therefore, a pluractional operator targets a degree argument of a scalar predicate. A plural operator which includes a one-place cumulative operator – a so-called distributive operator (Beck and von Stechow 2007) – works on the degree domain.

6.3.1 Introducing Degree as the Definedness Domain

We have shown that there is more than one type of predicate reduplication in Korean. Predicate reduplications, then, can vary across other languages. Let us examine some examples which are observed across other languages.

First, V *and* V in English has a different semantic domain from both P-*ko* P and P-*ti*-P. Beck and von Stechow (2007) identify *and* in 'V *and* V' as a cue of plain pluractional operator and present the semantic domain of V *AND* V as follows. The predicates in V *AND* V are restricted to be cumulative and non-divisive.

(43) a. **Cumulative and Non-divisive**:

Sally ran and ran. [Sally [RED [AND_{cov} ran]]] (a repeating reading)

b. **Cumulative and Divisive**:

*Sally was sick and sick.

c. **Non-cumulative and Non-divisive**:

*The train arrived and arrived.

In addition, Beck (2012:79ff) also deals with reduplicative pluractional comparisons in English, which consists of comparative adjectives and *and* in the form of A-*er and* A-*er*. This construction yields only the incremental reading. Here, the repeated adjective is in the form of comparative; that is to say, the adjectives are gradable and provide the domain of degrees.

(44) (Beck 2012:79ff)

a. Otto ran <u>fast**er** and fast**er**</u>.

The situation can be divided into a sequence of relevant subevents such that in each of them, Otto's speed exceeded his speed in the predecessor event.

b. [RED [particle [AP Adjective -er]]]

Second, it is not difficult to find the phenomenon where a reduplication of a lexically non-gradable verb yields a degree-based reading. For example, the verbal reduplication V *ni* V in Japanese has an augmentative reading 'V to the utmost

extent' (Okamoto 1994).

(45)[39] a. **Activity verbs** (Action verbs in Okamoto's term)

Kyooko wa hasiri **ni** hasitta. (Okamoto 1994:384)

Kyooko TOP running LOC run-PST.

'Kyoko ran to the utmost extent / as much as she could.'

b. **Change-of-state verbs** (Process verbs in Okamoto's term)

nihongo wa tonikaku koko zyuunen hodo de (Okamoto 1994:384)

Japanese TOP anyway these ten.years about in

midare **ni** midarete kita keredo, …

becoming.disorderly LOC become.disorderly ASP.PERF but

'In these ten years or so, the Japanese language has become disorderly to the utmost extent, but …'

c. mazusikatta koro wa sukaato iti-mai kau no ni mo,

poor-PST time TOP skirt one-piece buy COMP LOC even

kangae **ni** kangaeta sue ni yatto mise ni mukatta.

thinking LOC think-PST end LOC finally store LOC head.for-PST

'When I was poor, even to buy one skirt, I thought about it as much I could, and only after that I finally went to the store.'

More precisely, the preceding verb is fixed in the nominalized form and is followed by the locative marker *ni*; then, V *ni* V corresponds to 'V in addition to V-ing' literally.

V *ni* V in Japanese has the semantic condition of NO BOUNDEDNESS.

[39] The exemplified sentences and interpretations are brought intact from Okamoto (1994:384), but the glosses are partly modified to match the form of this thesis. The glosses on *ni* are added as a locative case marker.

(46) a. Kyooko-wa mame-o tabe-**ni** tabeta.
Kyooko-TOP bean-acc eating-LOC eat-PST
'Kyoko ate to the utmost extent / as much as she could'

b. Kyooko-wa mame-o hito-kakae tabe-**ni** tabeta.
Kyooko-TOP bean-ACC one-armful eating-LOC eat-PST
'Kyoko ate (#up) an armful of beans to the utmost extent / as much as she could'

c. Kyooko-wa mame-o hitotu tabe-**ni** tabeta.
Kyooko-TOP bean-ACC one.piece eating-LOC eat-PST
'Kyoko ate (#up) an armful of beans to the utmost extent / as much as she could'

b. Kyooko-wa mame-o hito-kakae {*zenbu} tabe-**ni** tabeta.
Kyooko-TOP bean-ACC one-armful all eating-LOC eat-PST
Intended: 'Kyoko ate up an armful of beans to the utmost extent / as much as she could'

Here is another example. In Sicilian, there are three reduplication rules which form lexical entries (Todaro and Villoing 2012:177f). One of those reduplications forms adjectives with intensive readings by making use of verbs as a reduplicant. This is distinguished from Japanese verbal reduplication V *ni* V in that this predicate refers to states as an adjective.[40]

[40] Some of these adjectives can be in the syntactic position of noun as in (47b-ii) (Todaro and Villoing 2012:177).

(47) Verb reduplication forming adjectives: VV>A (intensification)

a. [[cala]$_V$-[cala]$_V$]$_A$

go.down-go.down

'goes down easily'

Context:

'stu	vinu	è	cala-cala
DET	wine	be.3SG	go.down-go.down

'it's good wine, it goes down easily, it's sweet, easy to drink'

b. [[pala]$_V$-[pala]$_V$]$_A$

talk-talk

'person who talks too much / glib talker'

Context:

(i)

Claudio	è	pala-pala
Claudio	be.3SG	talk.talk

'Claudio speaks too much'

(ii)

Claudio	è	un	pala-pala
Claudio	be.3SG	DET	talk.talk

'Claudio is someone who speaks a lot/too much'

Third, intensive readings are observed in the reduplication of psych predicates as well. The following example is a verb reduplication in Niuean (Haji-Abdolhosseini et al. 2002). Here, it is not the case that the psychological state of being afraid occurs more than once.

(48)[41] (Haji-Abdolhosseini et al. 2002:485)

a. Ne lika a ia ke tule e akau.
PST fear ABS she SBJTV high ABS tree
'She is afraid of being up the tree'

b. Ne **li**lika a ia ke tule e akau.
PST fear.RD ABS she SBJTV high ABS tree
'She is intensely afraid of being up the tree'

Another example of a psych predicate is illustrated in Hausa. According to Součková and Buba (2008:137) and Součková (2011:33f), the reduplications of gradable verbs *ruuɗêe* /*gàji* / *dàamu* 'be confused, tired, worried'[42] require a plural subject; simultaneously, the gradable property of the predicate associated with each member of the plural subject is intensified. What is characteristic of Hausa pluractionals is that intensification is not possible as the sole interpretation even when the repeated verb corresponds to a psych predicate.

(49) a. (Součková 2011:34,114)
Yâraa sun rur-rùɗee
children 3PL.PF RED-be.confused
'The children were very confused' (beyond control, alarmed)

[41] SBJTV: subjunctive, RD: reduplication (Haji-Abdolhosseini et al. 2002:476).

[42] These gradable verbs belong to the verb class of 'grade 7' in the system of morphological classes of verbs in Hausa. Verbs in grade 7 are "all intransitive. In the perfective TAM, they have the semantics like passive and usually mean that some action is thoroughly or well done" (Součková 2011:34,116).

b. (Součková 2011:34)

*Yaaròn yaa rur-rùuɗee

boy.the 3SG.M.PF RED-be.confused

Intended: 'The boy was very confused'

c. (Součková 2011:34,115)

Yâraa sun ruuɗee

children 3PL.PF be.confused

'The children were confused'

In summary, the types of degree-based readings – including intensification or incremental (gradual) readings – are diverse across languages. Phenomena such *nanali*, P-*ko* P and P-*ti*-P in Korean are a part of these various types of reduplications across the nominal and verbal as well as adjectival domains. Especially, the examples mentioned above support our data by identifying the following facts: (i) verb reduplication can target the domain of degree, not time, even though the verb is not considered as lexically gradable, (ii) the intensive reading simultaneously appears with other pluractional readings in the single pluractional form. Therefore, 'degrees' are welcomed into the domains of pluractionality.

6.3.2 The Composition of Plural Operator and Statives

As shown above, the P-*ko* P construction expresses a variety of readings. Based on the fact that there is not any particular restriction to lexical selection other than *extendability*, the P-*ko* P construction fairly reflects the semantic properties given by the predicate as an input. Specifically, when 'P-*ko* P' has an intensive reading,

there is no particular restriction to lexical selection other than gradability.

The *extendabiltiy* of P-*ko* P is invoked as follows. If x is increased by some operation O and x is arranged in a line y, the result of x is extended along the line y. As for time intervals, it could be a sum of time intervals neighboring each other, e.g. an extended time interval. As for entities of participants, it could be a number of members in a group. Then, as for degrees, it could be a sum of degrees neighboring each other, e.g. an extended degree.

Wood (2007:192) treats intensification of gradable stative predicates (*mrmry* 'be pretty' in Hausa) as "truly intensive meanings" and suggests these meanings involve pluralization of an implicit standard or lower boundary of the range of scale, instead of an event argument.

According to Krifka (1998:3-4), non-cumulative, quantized predicates[43] are expressed by *extensive measure functions* (e.g. LITER, KILOGRAM, or HOUR). Extensive measure functions, which are based an operation of *concatenation*, which is related to the arithmetical addition (+),[44] has two properties of *additivity* and *commensurability*. The notion of an extensive measure function **m** is defined for a part structure P, which is a basis for the structures of event, path, time, and scale.

[43] Krifka (1998:3) mentions that while cumulative predicates have as a part a *qualitative* criterion of application, *quantitative* criteria of application leads to non-cumulative, quantized predicates.

[44] According to Krifka (1998:4), Measure functions, in general, are functions that relate an empirical relation for physical bodies to a numerical relation for numbers. Numbers mapped by a measure function are applicable to the comparison > or <, but not to the arithmetical addition +. For example, water at 20°C and water at 20°C do not sum up to water at 40°C.

(50) (Krifka 1998:4)

m is an extensive measure function for a set *U* with respect to concatenation "^" iff:

a. **m** is a function from *U* to the set of positive real numbers.

b. $\forall x,y \in U\ [\mathbf{m}(x \wedge y) = \mathbf{m}(x) + \mathbf{m}(y)]$ (additivity)

c. $\forall x,y \in U\ [\mathbf{m}(x) > 0 \wedge \exists z \in U\ [x = y \wedge z] \rightarrow m(y) > 0]]$ (commensurability)

(51) (Krifka 1998:4)

If $P = \langle U_P, \oplus_P, \leq_P, <_P, \otimes_P \rangle$ is a part structure, and **m** is an extensive measure function for (subsets of) U_P with concatenation ^, then m is an extensive measure function for P iff the following holds:

For all $x, y \in U_P$, $x \wedge y$ is defined only if $\neg\, x \otimes_P y$, and if defined, $x \wedge y = x \oplus_P y$.

In the case of pluractionality, it is a cumulation operator to bring the summation of degrees about. There are pluralized comparison operations in P-*ko* P, by adding degrees to a standard of comparison, as in little arrows which raises the lower bound in Figure 5. The big arrow area with the dashed line on top of $D_{Attribute\text{-}P}$ corresponds to the denotation of P-*ko* P.

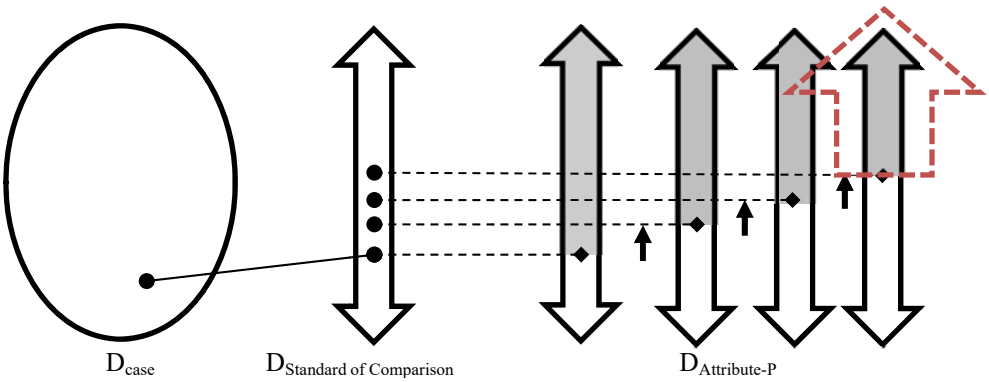

Figure 5. Mapping Relations of P-*ko* P

In the reduplication construction, in cases where P-*ko* P is modified by a degree modifier, the reading depends on the position of the modifier. In addition, only a few modifiers can intervene between the preceding part and the following part: adverbs *tto* 'again', *tewuk* 'much more' and the additive particle -*to* 'too'. Here, both of the former adverbs have the same atemporal meaning as the additive particle -*to* 'too': *additivity*.

(52) a. kohyang-i {tto/tewuk/cokum} kulip-**ko** kulip-ta.
hometown-NOM **{again/more/a.little}** be.sick.for-and be.sick.for-DECL
(i) 'Again, I miss my home very much'
(ii) 'I miss my home much more [than before]'
(iii)'A bit, I miss my home'

b. kohyang-i kulip-**ko** {tto/tewuk/*cokum} kulip-ta.
hometown-NOM be.sick.for-and **{again/more/*a.little}** be.sick.for-DECL
'I miss my home very much (Lit. [I] am sick and sick for home)'

(53) a. (Song J-M 2003:39)
kulip-**ko-to** **tewuk** kulipta
be.sick.for-and.CONC more be.sick.for
'to miss very much'

b. (Song J-K 2011:302)
kulip-**ko** **tto** kuliwu-n kohyang
be.sick.for-and again be.sick.for-ADN hometown
'the hometown missing very much'

On the other hand, an intensive reading indicated by P-*ti*-P is that the degree of the object is obviously in the denotation of the predicate stem P through the cases: 'in any case, it is P'. The domain of P-*ti*-P consists of degrees that are beyond all

the standards in cases. There are two types of mappings: (i) the one is from the domain of cases (D_{case}) to the domain of standard of comparison ($D_{Standard\ of\ Comparison}$), and (ii) the other one is from $D_{Standard\ of\ Comparison}$ to the domain of degree of attribute P ($D_{StandaAttribute\text{-}P}$). The latter is a comparison operation. Unlike P-*ko* P, P-*ti*-P has only a single comparison operation; there is no pluralized comparison. Instead, pluractionality works on the former mapping relation from D_{case} to $D_{Standard\ of\ Comparison}$. The big arrow area with the dashed line on top of $D_{Attribute\text{-}P}$ corresponds to

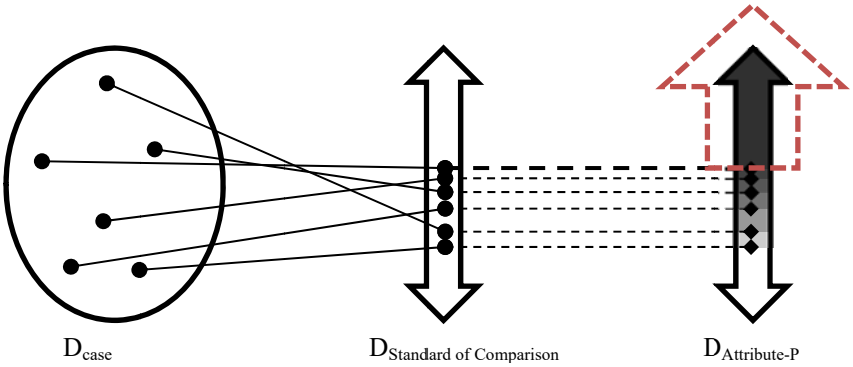

Figure 6. Mapping Relations of P-*ti*-P (II)

the denotation of P-*ti*-P.

This analysis provides an extended view that the relation between P-*ko* P and P-*ti*-P corresponds to the internal/external distinction. P-*ko* P has a sequentially pluralized comparison of degree values with the summation of degrees; on the other hand, P-*ti*-P has a single comparison of degree to a group of standards of comparison which cumulate throughout cases.

7 Concluding Remarks and Future Research

This thesis organized and presented a variety of pluractionality based on a variety of the semantic conditions reflecting characteristics of pluralized events, times, spaces, entities, and degrees. The evaluation of research results is supplemented in addition with answers about the issues which were suggested in Section 1.1.

(i) Which types of pluractional phenomena exist?

The variety comes from the types of arguments which a plural operator requires. From this, the phenomena that a single marker has a variety of interpretations (e.g. duration, repetition, continuation, incrementality, intensification, and argument plurality) can be ascribed to a variety of semantic environments satisfying its semantic condition (e.g. reduplicative adverbs *ta-tal-i* 'month by month' and *halwu-halwu* '(from) day to day'; verbal derivational suffixes *-keli-*, *-tay-* and verbal complex V-*e tayta*; predicate reduplication P-*ko* P 'P and P'). In other words, the semantic condition includes more than one natural semantic class.

(54) A linguistic element indicates event plurality; at the same time, it yields other types of readings that seem to be far from event plurality.

On the other hand, some linguistic element targets one semantic class and yields one type of reading. Although a marker does not yield certain typical types of pluractional readings (e.g. repetition, duration, and continuation), one semantic class (e.g. open and upper open scalar statives for P-*ti*-P) the only reading

(e.g. incrementalities from *na-nal-i* 'day after day') can be identified as pluractionality on the basis of the presence of other pluractional phenomena (e.g. open and upper open scalar statives for attenuative reduplication in Mauritian and incrementalities from *ta-tal-i* 'month by month' and *halwu-halwu* '(from) day to day' in Korean).

(55) a. A linguistic element does not indicate event plurality, but it yields other types of readings which have been reported by other pluractional markers.

b. A linguistic element is irrelevant to the event, but it yields other types of readings which have been reported by other pluractional markers.

(56) a. *na-nal-i* 'day after day':

<indefinite changes on a strict linear order, INCREMENTAL>

b. P-*ti*-P:

<states with scale in which the upper end is open, INTENSIVE>

Furthermore, this thesis applied these perspectives not only to a single marker, but also to characteristic morpho-syntactic structures (e.g. reduplicative adverbs in the form of *N.N.(i)* and predicate reduplication constructions), and pointed out a limit on a single semantic type which is assumed based on identical 'morphological structures.' A variety of semantic conditions and interpretations are shown in the identical morphological structure. Semantic differences between *ta-tal-i* and *na-nal-i* are noteworthy in that they introduce a significant subtype of pluractionality to the semantics, beyond a lexical difference between two single items (e.g. *tuki-duki* 'month by month' and *hi-ni-hi-ni* 'day after day' in Japanese).

(ii) Can these types of phenomena be established as one semantic class?

Pluractional types presented through this thesis have the semantic condition of cumulativity in common. A variety of interpretations are based on other semantic characteristics where each of base predicates has as a semantic condition of cumulativity. Through the thesis, this semantic property was described by different terms: connectedness, unboundedness, repeatability, and extendability. This is a result of cumulativity occuring in different domains (e.g. events, times, spaces, entities, and degrees).

As for reduplicative adverbs, the connectedness between two immediately adjacent covers is realized in the domains of time, event, (and degree). Therefore, along with the time flow, the path of the event is extended. As for verbal derivational suffixes and the auxiliary verb, repeatability of actions or states with a rhythmical pattern is realized in the domain of spaces.

As for predicate reduplications, both P-*ko* P 'P and P' and P-*ti*-P 'P-TI-P' are defined under the notion of cumulativity. A base predicate in P-*ti*-P is cumulative in the domains of times and degrees at the same time; on the other hand, a base predicate in P-*ko* P is cumulative in at least one of the various domains. As a result, while P-*ti*-P yields only an intensive reading, P-*ko* P yields extended meaning on time intervals, spaces, events, participants, and degrees.

(iii) Is the notion of pluractionality still a valid semantic property to provide a unified explanation for a variety of meanings?

This thesis argued that the pluractionality is still valid to explain the significant semantic phenomena. The characteristics in the previous literature can cover the

new data in an extended version. The internal/external distinction is extended from the domain of the event to other domains (e.g. P-*ti*-P 'P-TI-P' vs. P-*ko* P 'P and P' in the domain of degrees; internal/external localization in Sicilian). In addition, while investigating incrementality and intensification which are derived from pluractional markers, we confirms the extensibility of the domain which pluractional theory ranges over: from the event to the degree (e.g. scalar pluractionality).

In this thesis, we introduced properties of mathematical logic to the semantic descriptions on individual lexical items, carried out comparisons between the lexical meanings, and then established a generalized property and several semantic subtypes of pluractional phenomena. For this purpose, we set up various semantic environments and examined the semantic compositionality of pluractional markers. In the process, instances were reported in which modifiers as well as arguments of predicates actively engaged in aspectual composition (e.g. measure phrases, scalar phrases, and manner adverbs).

For future research, the applicability of semantics presented by this study should be examined by applying it to pluractional phenomena across languages with typological perspectives. The status of pluractional types identified in Korean will be decided in comparison to other languages: cross-linguistic or language-specific.

This thesis focused mainly on the internal pluractional phenomena; however, only for P-*ti*-P, external pluractional phenomena P-*ko* P 'P and P' were provided as a counterpart for internal pluractional phenomena.

Likewise, for other internal pluractional phenomena, there are linguistic expressions in Korean expected as external counterparts: the reduplicative adverb *pen-pen-i* 'time after time / time and time again' and the verbal complex with an auxiliary verb *ssahta* 'cumulate'. These can provide other types of pluractionality.

(57) a. **pen-pen-i** sengcek-i tteleci-ess-ta.
time-time-ADV score-NOM fall-PST-DECL
'Time after time, the score degraded' (in a repeated reading)

b. **ta-tal-i** sengcek-i tteleci-ess-ta.
month-month-ADV score-NOM fall-PST-DECL
'The score degraded month by month' (in an incremental reading)

(58) a. Mina-ka chaksang-ey ku chayk-ul olli-**e ssah**-nunta.
M.-NOM desk-loc that book-acc raise-CONJ CUMULATE-DECL
'Repeatedly, Mina places that book on the desk' (in a repeated reading)

b. ??Mina-ka chaksang-ey ku chayk-ul olli-**e tay**-nta.
M.-NOM desk-loc that book-acc raise-CONJ REPETITIVE-DECL
Intended: 'Mina keeps placing that book on the desk'

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Appendix I. The Types of Roots with *-keli-* or *-tay-*

531 types of roots with *-keli-* and 33 types of roots with *-tay-* are searched from *the 21st-Century Sejong Corpus* (2011).

(1) Roots with *-KELI-* (531 types)

kalulang, kamwul, kantayng, kantwung, kancil, kyawuttwung, kyawuskyawus, kyawus, ketulek, ketulmek, kemwus, kentul, kelkun, keykel, keytwutel, *(kotalkuneykey)thwutel, komwul, kosilang, kwusileng, kwunsileng, kwupsin, kwupsil, kwungsileng, kwungsis, kuttek, kuleng, kululeng, kunsil, kuncil, kulsseng, kulkcek, kiwuttwung, kiwus, kkattak, kkancwuk, kkalkkal, kkampak, kkamppak, kkamccak, kkangchwung, kkekkul, kkentul, kkelkkel, kkelleng, kkempek, kkemppek, kkengchwung, kkokko, kkokkotayk, kkopwul, kkomcilak, kkongtang, kkwaykkkwayk, kkoysong, kkwululwuk, kkwumwul, kkwulkkek, kkwulkkwul, kkwumpek, kkwumthul, kkwungel, kkutek, kkutekkkutek, kkuttek, kkumek, kkumwul, kkucek, kkuncek, kkulkkul, kkumpek, kkumppek, kkungkkung, kkilwuk, kkicek, kkilkkil, kkingkking, napwul, napwulnapwul, naphwul, nallum, namsil, nayllum, netel, netul, newul, nethel, nephwul, nellum, nemsil, notak, nwiyes, nukul, nulicek, nulisnulis, numwul, numsilnumsil, nungkul, tatok, tatwuk, talkak, talkutak, talkulak, tallang, talmak, talsak, talssak, taylong, tetum, tephel, telketek, telkek, telkulek, telleng, telkheteng, telkheng, temseng, tepcek, totak, tolan, tolipan, tongkol, tongtong, twukun, twutel, twulen, twulipen, twulleng, twittwung, twiswung, twicek, twichek, tuksikul, tuksil, tulnallak, tullak, tullaknallak, tullang, tulmek, tulpek, tulssek, tulsseng, ttakkun, ttakkum, ttakttak, ttalkulak, ttallang, ttalssak, ttetum, ttecwuk, ttengtteng, ttotak, ttokttak, ttokttok, ttwukttak, mancicak, mancicek, malttong, maysuk, memwucek, memwus, memwusmemwus, mesuk,

melttwung, memchis, meysu, meysuk, mwuchwum, mwulssin, mwungkucek, mwungkul, mwungel, mikkun, mikkunteng, mikkul, milwucek, misik, micek, patong, patwung, patuk, pasulak, paccak, pantul, pancil, panccak, panccakpanccak, pallak, palpal, pangsil, paycil, payngkul, payngpayng, pyapicak, petwung, pelucek, pepel, pesek, pentuk, pentul, penttuk, pencil, penccek, pelttek, pelleng, pellwung, pellum, pelssim, pelcwuk, pelccwuk, pelkhek, pepsek, pengsis, pyelum, pokcak, pwukul, pwutwung, pwusulek, pwusul, pwukcek, pwulthwung, pwungpwung, pikutek, pipicek, pisil, pianyang, piyang, picwuk, piccwuk, pichek, pichil, pithul, pintwung, pinceng, pingkul, pingkus, ppantul, ppanccak, ppaykppayk, ppekkum, ppetulcek, ppenciltullak, ppengkus, ppiketek, ppikek, ppikus, ppicwuk, ppiccwuk, sakulak, santul, sallang, samppak, sayngkul, sayngkulsayngkul, sekeksekek, seseng, selleng, semttuk, sokon, sokun, soktak, soksal, swukek, swukwun, swukwunswukwun, swukun, swulen, swusen, swuktek, swulleng, swiswi, sumel, sumwul, sikkulpekcek, sisitek, sikhun, siksik, silttek, sillwuk, silsil, singkul, singkkus, sswukwun, sswukwuntek, sswusek, sswualla, sswuktek, sswukttek, ssumpek, ssikun, ssikuntek, ssipwuleng, ssiwel, ssiksik, ssikssik, ssillwuk, alun, amwul, awuwung, alccang, angal, angang, ayngayng, yacilang, yangnyang, elwung, elun, elunelun, elum, esulleng, eceng, ecil, ekek, ellun, elssin, elceng, elcceng, engeng, otul, omwul, omulak, omcik, wakul, watul, wangwang, wukwul, wukul, wutwuk, wululung, wumwul, wumwullek, wumwulccek, wuccwul, wuksin, wukcekpwukcek, wulleng, wulmek, wulkhek, wumssil, wumcilek, wumcik, wumccil, wungseng, wungel, wungwung, wicwuk, wingwing, ututuk, uluttakttak, ululeng, ululengululeng, ululung, ussuk, umum, ungcel, ikul, ikicwuk, icwuk, illeng, inging, catulak, capak, callang, caycal, caycay, celis, celkuleng, celttwuk, cellwuk, celpek, comwullak, cocal, colcol, congkus, congal, cwumwullek, cwuppyes, cwuek, cwucel, cwuchwum, cwungel, cwungelcwungel, cikun, cikul, cikkun, cipwun, cintuk, cilkeng, cilkum, cilpek, cilpekcilpek, cilchek, cilphetek,

cilphek, cipcek, cingcing, ccaykkak, ccaykccayk, ccayngccayng, ccekccek, ccellwuk, ccengcceng, ccongkus, ccongtang, ccongal, ccwukul, ccwuppyes, ccwungtel, ccwungelccwungel, ccungccung, ccicci, ccikcep, ccikccik, ccilkkum, ccillwuk, ccilpek, ccingkus, ccingccing, challang, chalpulak, chalssak, chaykun, chelulek, chelpetek, chelssek, cholssak, chwukun, chwulleng, chikun, chikuntek, chingel, khaykkhayk, khekkhek, kheykkheyk, khollok, khongtak, khongtang, khwukkhwuk, khwullek, khwulleng, khwungtakkhwungtak, khwungtekkhwungtek, khwungkhwang, khwungkhwung, khungkhung, khitutuk, khituk, khitul, khikkhik, khilkhil, thangthang, thepek, thewul, thecek, thellek, thotak, thwutel, thwutwutwuk, thwutulu, thwulthwul, thwungthwung, thicek, phatak, phatuk, phatul, phalttak, phallak, phallang, phetek, phetuk, phelttek, phelletek, phellek, phelleng, photwung, phosil, phwutul, phwuksek, phwuksin, phwulssek, phwungseng, phisik, hanucak, hanul, halong, hakhak, hantul, halttak, hetek, hetwung, hepwucek, hepicek, hewucek, hewicek, hekhek, helttek, helleng, helhel, heyhey, heykheyk, hoho, holccak, hwakkun, hwukkun, hwutwul, hwutul, hwucwucwuk, hwulccek, hwumchek, hwicheng, hunucek, hunul, humwul, huhung, huntul, hulkus, hulkkum, hulkkis, hungel, hungcheng, huykkus, huyttuk, huypentek, huyhuytak, huyhuytek, hicwuk, hihi, hihitek, hilkum, hilkus, hilkkum, hinghing

(2) Roots with -*TAY*- (33 types)

kelchitek, kkalkkal, kkicek, kkilkkil, kkingkking, napwul, petwung, pelleng, pepsek, pwululung, pwulttwuk, sokon, swusen, ssikun, elun, usu, cwumwullek, cwucel, cwungel, cipcek, thwutel, thwungthwung, *phyellek, hanul, hetwung, hewucek, hehe, hwutul, hwipentuk, hungel, hungcheng, hunghung, huypenttuk

Appendix II. Examples of Verbal Complex V-*e tayta*

The following sentences are searched from *the 21st-Century Sejong Corpus* (2011).

(1) ai-tul-i kkal-kkal wus-e tay-nta.
child-PL-NOM screaming.with.laughter laugh-CONJ REPT-DECL
'Kids keep laughing cheerfully'

(2) Cwunswu-nun sin-i nas-e
C.-TOP joy-NOM occur-CONJ
'hakkyocong-i ttayng-ttayng-ttayng'-ul pwull-e tay-ss-ta
school.bell-NOM ding-dong-dang-ACC call-CONJ REPT-PST-DECL
'Chunsu was excited, so kept singing the song '*The school bell rings ding dong dang*"

(3) Changho-nun "tayhan-toklip-mansey"-lul oychy-e tay-ss-ta.
C.-TOP "Korean-independence-hooray" shout-CONJ REPT-PST-DECL
'Changho kept crying "Hooray, independence of Korea"'

(4) totwukmac-un ilyongha-l yangsik-ul chac-a
be.stolen-ADN use-ADN foot-ACC search-CONJ
cwuk-ca-ko oychy-e tay-nun salam-un….
die-EXH-CONJ shout-CONJ REPT-ADN person-TOP
<Hwang Sekyeng, Etwum-uy casik-tul>
H. darkness-GEN offspring-PL
'As for a person who keeps crying furiously for searching stolen food, … <Hwang Sekyeng, *Sons of Darkness*>'

(5) nachse-n salam-i taymwun an-ulo tuleo-ca
unfamiliar-ADN person-NOM gate the.inside-DIR enter-CONJ
kay-ka makwu cic-e tay-ss-ta.
dog-NOM severely bark-CONJ REPT-PST-DECL
'As a stranger entered the room, the dog kept barking / barked severely'

(6) hana-ka cis-nun soli-ey maul-uy kay-tul-i
one-NOM bark-ADN sound-INST village-GEN dog-PL-NOM
soli-ey soli-lul i-e cic-e.tay-ki sicakha-yss-ta.
sound-LOC sound-ACC connect-CONJ bark-CONJ.REPT-NML begin-PST-DECL
'From one dog barking, dogs in the village sequentially began to bark severely'

(7) ku-nun tanghwangha-ye cilmwun-kwa-nun sangkwan-eps-nun
he-TOP be.embarrassed-CONJ question-CORN-TOP relation-NEG.COP-ADN
mal-ul cwuw-e.tay-ki sicakha-yss-ta.
speech-ACC pick-CONJ.REPT-NML begin-PST-DECL
'He was embarrassed, so began to talk about words unrelated to the question'

(8) sonyen-un encey kulay-ss-nunya-nun tus thayyenhi
boy-TOP when do.so-PST-INT-ADN (be.)likely.to calmly
hwiphalam-ul pwul-e.tay-mye cayppalli cingkemtali-lul
whistle-ACC blow-CONJ.REPT-CONJ quickly stepping.stone-ACC
ttwi-e kenn-e pely-ess-ta.
jump-CONJ cross-CONJ throw.away-PST-DECL
'The boy has crossed a stream on stepping-stone hopingly with keeping on whistling calmly as if nothing had happened'

(9) wichung salam-tul-i ttetul-e tay-nun palam-ey
upstairs person-PL-NOM make.noise-CONJ REPT-ADN wind-INST

na-nun hanswum-to ca-l swu-ka eps-ess-ta.
I-TOP one.breath-CONC sleep-ADN way-NOM NEG.COP-PST-DECL
'Because the people upstairs made noise, I couldn't get a wink of sleep'

(10) wuli-nun ku-lul mengchengi-lako
we-TOP he-ACC stupid-CONJ
nolly-e tay-ko-nun hay-ess-ta.
make.fun.of-CONJ REPT-and-TOP do-PST-DECL
'We used to keep making fun of him'

(11) aki-ka emma-lul chac-a tay-ss-ta.
baby-NOM mom-ACC search-CONJ REPT-PST-DECL
'{A/The} baby kept crying for its mom'

(12) ku-nun cwungphwung-ey kelly-e
he-TOP stroke-LOC fall.ill-CONJ
son-ul ttel-e tay-ess-ta.
hand-ACC shake-CONJ REPT-PST-DECL
'He kept trembling his hand(s) because of stoke'

(13) eli-n haksayng-ul kulehkey takk-atay-ci-man mal-ko
young-ADN student-ACC so scold-CONJ.REPT-CI-only NEG-and
cal thaill-e po-key.
well give.a.good.talking.to-CONJ try-IMP'
'Don't scold a young student like that; try on giving him/her a good talking-to'

(14) Sekcin-un Wuyengmo-ka malponcen-to mos chac-key
S.-TOP W.-NOM word.principal-CONC NEG find-ADV
tamol-a tay-nun palam-ey unkunhi sok-i
lash.out-CONJ REPT-ADN wind-INST inwardly stomach-NOM

twithully-e cham-ul swu-ka eps-ess-ta.
be.twisted-CONJ endure-ADN method-NOM NEG.COP-PST-DECL
'As Wuyeongmo lashed out at Seokjin irrefutably, Seokjin became angry and couldn't stand him'

(15) salam-ul mwucimakciha-key mol-atay-ta.
person-ACC brutal-ADV lash.out-CONJ.REPT-DECL
'to press hard {a person/people} brutally'

(16) yang ttey-lul mol-a tayta
sheep flock-ACC drive-CONJ REPT
'to keep on driving a flock of sheep'

(17) ku-nun swul-ul mak masy-e.tay-ss-ta.
he-TOP liquor-ACC blindly drink-CONJ.REPT-PST-DECL
'He kept on drinking an alchol blindly'

(18) namphyen-un mayil swul-man masy-e tay-nta.
husband-TOP every.day liquor-only drink-CONJ REPT-DECL
'The husband is on the beer every day'

(19) wischung ai-tul-i makwu ttwi-e.tay-ss-ta.
upstairs child-PL-NOM recklessly jump-CONJ.REPT-PST-DECL
'The children upstairs kept on jumping recklessly'

(20) ai-tul-un chalyeysang-ey olli-l pwuchimkay-lul
child-PL-NOM memorial.service.table-LOC raise-and pancake-ACC
cip-e mek-e tay-ss-ta.
pick-conj eat-conj rept-pst-decl
'Kids kept on picking and eating vegetable pancakes which were prepared for the memorial service table'

국문초록

복수사건성의 의미 구조 연구

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조 유 미

본고는 복수화된 사건, 시간, 공간, 개체, 정도의 특성을 반영하는 여러 의미적 조건을 기반으로 하여 복수사건성(pluractionality)의 다양한 유형을 체계화하여 제시하면서, 복수사건성이 다양성을 보이는 여러 의미 현상을 통합적으로 설명하는 데 유효한 속성임을 주장한다.

본고에서 제시되는 모든 복수사건성의 유형은 공통적으로, 결합 대상이 되는 기본 술어가 누적성(cumulativity)을 충족시킬 것을 그 의미 조건으로 건다. 이러한 누적성의 개념은 본고에서 다루는 복수사건성 현상의 유형에 따라 연결성(connectedness) 및 반복가능성(repeatability), 무계성(unboundedness), 확장성(extendability)이라는 다양한 용어들을 통해 포착된다. 이는 누적성이 사건, 시간, 공간, 개체, 정도 등의 다양한 의미 영역에 적용된 결과이다. 이러한 의미 영역들은 복수 연산자가 요구하는 논항 유형에 대응한다.

더불어, 반복(repetition), 행위 지속(duration), 상태 지속(continuation), 증량성(incrementality), 강화(intensification), 논항 복수성(argument plurality) 등과 같은 의미 해석의 다양성은 복수사건성 표현과 결합하는 기본 술어가

누적성과 더불어 그 밖에 가질 수 있는 여러 의미 특성에 기인한다. 이러한 의미 특성 가운데 일부는 누적성과 더불어 복수사건성의 의미 조건을 구성하는 필수 요소로서 관찰된다. 이때 복수사건성의 의미 조건을 어떠한 의미 특성에 따라 구성하느냐에 따라 도출가능한 의미 해석 유형의 목록이 달라진다. 이에 본고는 한국어의 중첩 부사 '다달이', '나날이', '하루하루' 및 동사파생접미사 '-거리다'와 '-대다', 복합 술어 구문 '-어대다', 술어 반복 구문 'P-고 P'와 술어 중첩 'P-디-P'를 복수사건성 현상으로 진단하고, 이를 바탕으로 복수사건성의 유형별 의미 구조를 살펴본다.

본고는 선행 연구에서 사건 복수성을 기준으로 제시된 세부적 특성을 사건 이외의 영역으로 확장시킴으로써 다채로운 복수사건성 현상에 대한 포괄적 설명을 제시한다. 사건내적복수성(Event-internal Pluractionality)과 사건외적복수성(Event-external Pluractionality)으로 대표되던 내부-외부 구분은 사건 영역에서 다른 영역으로 확장된다. 본고에서는 한국어의 'P-디-P'를 정도 영역에서의 내적복수사건성(Internal-pluractionality) 표지로 분석한다. 이 'P-디-P' 표지는 외적복수사건성(External-pluractionality) 표지로 확인되는 'P-고 P'가 정도 영역에 작용할 때와 다른 유형의 강화 의미 해석을 보이는데, 본고는 이러한 차이를 내부-외부 구분에 대응시켜 분석한다. 더불어, '나날이'나 'P-디-P'와 같이 증량성 또는 강화 등의 척도 해석만이 단독으로 도출되는 복수사건성 표지는 복수사건 연산자가 정도 영역을 도입한 결과이다. 특히, 'P-디-P'의 경우는 상태 술어로서 사건 영

역이 아예 배제되지만, 정도 영역만으로도 복수사건성 으로 설명될 수 있다. 이는 복수사건성 이론이 포괄하는 개별 영역의 대등한 독립적 지위을 확인해 준다.

본고는 개별 어휘 요소의 의미 기술에 있어 수리논리적 속성을 도입하고, 이를 바탕으로 서로 다른 환경의 어휘 의미들을 비교할 수 있게 하여, 복수사건성 현상의 일반 속성 및 여러 하위 의미유형을 확립한다. 이를 위하여 본고는 다양한 의미 환경을 설정하고, 복수사건성 표지의 의미 결합성을 검증한다. 이러한 과정에서, 상적 결합에 술어의 논항뿐만 아니라 계량구, 척도구, 양태 부사 등의 수식어가 적극적으로 개입하는 사례들이 함께 확인된다. 이에 본고는 사건내부복수성의 특성으로 알려진 상적 부류 선택 제약(aspectual selection)이, 실제로는 기존의 특정 상적 부류들을 넘어서는 일반적 의미 자질로 기술되어야 함을 주장한다.

주요어: 복수사건성, 사건내적복수성, 척도성, 의미 영역 선택 제약, 중첩, 접사, 한국어

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