An Experimental Study of Resultative Constructions with X-key*

Juwon Lee · Eunjeong Oh · Sanghoun Song
(Kyung Hee University · Sangmyung University · Incheon National University)

Juwon Lee · Eunjeong Oh · Sanghoun Song (2018), An Experimental Study of Resultative Constructions with X-key. Studies in Linguistics 49, 249-274. In this article we present experimental evidence supporting the two syntactic hypotheses regarding Korean resultative constructions with X-key proposed in Lee (2016): (i) the resultative predicate, X-key, is syntactically an adverb (not an adjective), and (ii) X-key or the result phrase headed by X-key is a complement of the main verb in a resultative sentence. First, we provide a set of experimental results about resultative constructions with Adj(ective)-key with respect to the two syntactic properties, and then those about resultative constructions with V(erb)-key. In the current study, we conducted the acceptability judgment testing on a comprehensive scale using the 5-point Likert scale task and the binary Yes/No task. 264 university-level students participated in the current experiment (132 for each experimental task). We analyzed the experimental results using the statistical techniques in a quantitative way, including the T-test, ANOVA, and Fisher Yates Exact test. We argue that the experimental results empirically support the adverbial complement analysis of Korean resultative constructions with

* We would like to thank the three anonymous reviewers for their comments. This work was supported by the Ministry of Education of the Republic of Korea and the National Research Foundation of Korea (NRF-2015S1A5A2A03048485).
X-key. (Kyung Hee University·Sangmyung University·Incheon National University)

Key Words: resultative construction, secondary predicate, experimental syntax, adverb, complement

1. Introduction

This paper discusses the syntax of what has been referred to as predicative resultative construction in Korean, exemplified in (1), and presents some experimental evidence suggesting that X-key is syntactically an adverb and it (or the result phrase headed by X-key) is a complement of the main verb in a resultative sentence (see the different types of resultative constructions in Wechsler & Noh, 2001 and discussions on Korean resultatives in Kim, 1993; Kim & Maling, 1997; Wechsler & Noh, 2001; Lee & Lee, 2003; Shim & den Dikken, 2007; Son, 2008; Lee, 2016; Oh & Song, 2016; among others).

(1) a. ku-ka mwun-ul ppalkah-key chilhay-ss-ta.
    he-Nom door-Acc red-Key paint-Pst-Dec
    ‘He painted the door red.’

    he-Nom shoes-Nom threadbare-Key run-Pst-Dec
    ‘He ran so that (his) shoes became threadbare.’

It is normally understood that in (1a) the resultative predicate ppalkah-key ‘red-Key’ is predicated of the matrix object mwun-ul ‘door-Acc’ in a controlled structure (Wechsler & Noh, 2001). This means that the implicit subject of the secondary predicate is co-indexed with the matrix object. In (1b), however, the nominative NP sinpal-i ‘shoes-Nom’ and the resultative predicate talh-key ‘threadbare-Key’ constitute a fully saturated result clause
(Wechsler & Noh, 2001: 404). In other words, the explicit nominative subject "sinpal-i ‘shoes-Nom’ appears in the result clause, and no co-indexation is involved in (1b). Although the two sentences in (1) involve some syntactic differences, they share the key notion of resultative as defined in (2).

(2) As a result of the event denoted by the main verb, an entity undergoes a change of state denoted by the result predicate.

For instance, in (1a) the door became red due to the painting event, and in (1b) the shoes became threadbare because of the running event.

There have been various clausal analyses of Korean resultative constructions of sentences like (1a) in the literature (see Shim & den Dikken, 2007; Shibagaki, 2011 for TP adjunct analysis or Son, 2008 for small clause complement analysis). In particular, Lee (2016) proposed an adverbial clause complement analysis of Korean resultative constructions. The present experimental study presents a set of distributional data to support the following two syntactic hypotheses about Korean resultative sentences proposed in Lee (2016).1

(3) a. The resultative predicate, X-key, is syntactically adverb.

b. X-key or the result phrase headed by X-key is a complement of the main verb in a resultative sentence.

This article is organized as follows. Section 2 briefly goes over the three basic types of English resultative constructions and the corresponding constructions in Korean. The experimental design is presented in Section 3. Section 4 discloses experimental evidence that Adj(ective)-key is syntactically

1 In addition to the two hypotheses, Lee (2016) proposed that X-key heads a fully saturated result clause (or a pro-dropped clause), but in this paper we focus on the two hypotheses given in (3). Some experimental results of the pro-drop clausal analysis of Korean resultative constructions with X-key will be presented and discussed in future work.
an adverb and a complement of the main verb in a resultative sentence. In a similar way, Section 5 presents experimental evidence suggesting that V(verb)-key is adverbal complement of the main verb in a resultative sentence. Section 6 concludes this article.

2. Background: Three types of resultative constructions

A resultative meaning (two events takes place, one of which is the result of the other) can be expressed in three different syntactic forms in English: predicative resultative, ECM (Exceptional Case Marking) resultative, and clausal resultative (Wechsler & Noh, 2001). In this section, these three types of English resultative constructions are summarized, and they are compared to the corresponding Korean resultative constructions.

2.1. Predicative resultative construction

The first type is predicative resultative construction. This is what is normally called resultative construction in the literature. Some examples are given in the following (Wechsler & Noh, 2001). Note that the sentences in (4) have a secondary predicate italicized, and its predication subject underlined is an argument of the matrix verb.

(4) a. John hammered the metal\_j [ \_\_j flat].
   b. Robert\_j ran [ \_\_j clear of the fire].

In (4a) the metal is the object of the transitive verb hammered, and at the same time it is the predication subject of the secondary predicate flat. The hammering event caused the metal to become flat. In (4b), Robert, which is the subject of the verb ran, serves as the predication subject of the secondary predicate clear of the fire. The running event caused Robert to become clear of the fire.

An important property of predicative resultative construction is that an
argument is shared by the predicates. For instance, *the metal in (4a) is the object of the verb, and it also serves as the subject of the secondary predicate, and similarly for (4b). In other words, a kind of control structure is involved in the predicative resultative constructions: object control for (4a) and subject control for (4b) (see more about control structures in Bresnan, 1982; Horstein, 1999; Polinsky & Potsdam, 2006; Potsdam & Polinsky, 2012; among others). This is a fundamental property of predicative resultative constructions distinguishing them from the other types of resultative constructions, which we turn to below.

2.2. Exceptional Case Marking (ECM) resultative construction

The second type is called Exceptional Case Marking (ECM) resultative in Wechsler and Noh (2001). Consider the following examples of ECM resultative construction (from Wechsler & Noh, 2001: 394):

(5) a. The joggers ran themselves exhausted.
    b. We yelled ourselves hoarse.
    c. The joggers ran their Nikes threadbare.
    d. We laughed the speaker off the stage.

The verbs of the ECM resultative constructions in (5) are all intransitive *per se*, and the predication subjects of the secondary predicates are not semantic argument of the main verbs; No argument-sharing is involved in the constructions. For instance, in (5a) the predication subject themselves of the resultative predicate exhausted is not semantically required by the verb ran (e.g., *The joggers ran vs. The joggers ran themselves*), though the use of ran in the resultative sentence may syntactically require an accusative NP as one of its complements. The same argument holds for the other sentences in (5) (e.g., *We yelled vs. We yelled ourselves*). The ECM resultative constructions are similar to subject-to-object raising constructions exemplified in (6) to the extent that an accusative NP follows the main verb, and some
kind of predicate follows the accusative NP, and they do not have an argument-sharing (see more about raising structures in Postal, 1974; Davies & Dubinsky, 2004; Potsdam & Polinsky, 2012; among others).

(6) a. They believed her to read the book.
    b. They expected her to read the book.

In short, the ECM resultative constructions have the syntactic form (roughly, \([ V + NP + \text{secondary predicate}]\)) similar to that of the predicative resultative constructions; but, an important difference between them is that the former does not involve an argument-sharing, but the latter does (Wechsler & Noh, 2001).

2.3. Clausal resultative construction

The third type refers to clausal resultative construction. For example, in the following two clauses are linked in a sentence (Wechsler & Noh, 2001: 393).

(7) a. John hammered the metal; consequently, the metal became flat.
    b. John hammered the metal until it was flat.
    c. John hammered the metal, resulting in the metal becoming flat.
    d. John hammered the metal, causing it to flatten.

In (7a) the two distinct sentences are linked by the adverb \textit{consequently}; in (7b-d) a subordinate clause follows the main clause. In all the sentences in (7) the argument of the following clause is co-indexed with an argument of the preceding clause. But this co-indexation is not necessary in clausal resultative construction, as illustrated in (8) (Wechsler & Noh, 2001: 392).

(8) John hammered the metal; consequently, the neighbors woke up.
The two clauses in (8) are linked by pragmatic inference. It is plausible that an event of John’s hammering the metal causes the neighbors to wake up since the hammering event can make much noise. Therefore, any clauses can be associated with each other in a clausal resultative construction unless the cause-effect relation between them is implausible (*#John hammered the metal; consequently, it snowed in the morning*).

Intransitive verbs also allow a clausal resultative construction. The ECM resultative construction in (5c), repeated in (9a), corresponds to the clausal resultative construction in (9b).

(9) a. The joggers ran their Nikes threadbare.
   b. The joggers ran until their Nikes were/became threadbare.

The clausal resultative constructions are similar to the ECM resultative construction in that they do not involve an argument-sharing (note that we have co-indexations in (7), but they are not argument-sharing), but the former has a syntactic form (the resultative predicate appears in a subordinate clause or a distinct sentence) different from that of the latter. The two main properties of each of the three types of English resultative constructions are summarized in the following:

(10) a. Predicative resultative construction:
        \[ V + NP + \text{secondary predicate}, \]
        an argument-sharing (control)
   b. ECM resultative construction:
        \[ V + NP + \text{secondary predicate}, \]
        no argument-sharing (not control)
   c. Clausal resultative construction:
        \[ \text{clause} + \text{clause}, \]
        no argument-sharing (not control)

One thing to note here is that the predicative or ECM resultative
constructions can always be paraphrased as a clausal resultative construction (e.g., *John painted the door red* vs. *John painted the door so that it became red* or *John ran his shoes threadbare* vs. *John ran until his shoes are threadbare*), but not vice versa. Clausal resultative construction has less semantic restriction and more expressive power than the other types of resultatives. Now based on the classification of English resultatives in (10), the corresponding resultative constructions in Korean are examined in the following subsection.

### 2.4. Korean resultative constructions

The following examples are considered to be clausal resultative construction in Korean (Wechsler & Noh, 2001: 404):

    he-Nom shoes-Nom threadbare-Key run-Pst-Dec
    ‘He ran so that (his) shoes became threadbare.’

    he-Nom stomach-Nom hurt-Key eat-Pst-Dec
    ‘He ate until his stomach hurt.’

    Tom-Top Mary-Nom sleep-Key sing-Pst-Dec
    ‘Tom sang Mary to sleep.’

No argument-sharing is involved in (11), but this does not necessarily mean that they are clausal resultative construction since the ECM resultative constructions also do not involve an argument-sharing. It seems, however, that ECM (subject-to-object raising) resultative construction is not possible in Korean. Unlike the English ECM resultative constructions discussed above, the subjects of the secondary predicates in (11) cannot be accusative, as shown in (12) (see Wechsler & Noh, 2001).
Given the assumption that Korean does not have ECM resultative construction, the resultative sentences in (11) should be categorized as clausal resultative construction; furthermore, the nominative NPs and the resultative predicates form a fully saturated clause. Unlike the sentences in (11), the main verb can be transitive as in the following, and this sentence is also assumed to be a clausal resultative in Wechsler and Noh (2001) (the example is taken from Kim and Maling, 1997: 193):

(13) Sandy-ka koki-lul [ppye-ka humwuleci-key]  
Sandy-Nom meat-Acc bone-Nom gelatinous-Key  
salm-ass-ta.  
boil-Pst-Dec  
‘Sandy boiled the meat (until) the bone became gelatinous.’

The two NPs, koki-lul ‘meat-Acc’ and ppye-ka ‘bone-Nom’, are in a part-whole relation, but they basically refer to different entities (no argument-sharing). Then, due to the no-ECM-resultative assumption in Korean, (13) should be a clausal resultative sentence. In addition, we can see that a nominative subject can appear in the result clause, which is a crucial property of clausal resultative. In summary, the Korean clausal resultative sentences above have an explicit nominative subject of the resultative predicate; but, according to the transitivity of the main verb, a matrix object
can appear in the matrix clause.

In addition to the clausal resultative constructions, Korean has been considered to have predicative resultative construction. Consider the following examples (Wechsler & Noh, 2001: 404):

(14) a. ku-ka chelphan-ul [pyengpyengha-key]
    he-Nom metal-Acc flat-Key
    twutulki-ess-ta.
    hammer-Pst-Dec
    ‘He hammered the metal flat.’

b. Mary-nun thakca-lul [kkaykkusha-key]
    Mary-Top table-Acc clean-Key
    takk-ass-ta.
    wipe-Pst-Dec
    ‘Mary wiped the table clean.’

At first glance, the sentences in (14) look like predicative resultative construction in English, since the objects of the matrix verbs serve as the predication subjects of the resultative predicates. Simply put, it appears that they involve an argument-sharing (an object control). However, Lee (2016) argued that what has been considered as predicative resultative in Korean is actually a kind of clausal resultative; that is, all the Korean resultative sentences with X-key are clausal resultative construction. This clausal analysis is assumed in this paper. In the sections that follow, we focus on presenting some experimental evidence for the claim that X-key (or the result phrase headed by X-key) is the adverbial complement of the main verb in a resultative sentence.

3. Experimental Design

We created a set of test items for the current experiment, which consists of 94 sentences. The sentences involve the Adj-key or V-key forms that
potentially pertain to the notion of resultative constructions. In addition to the test items, we created six pretest items, ten control items, and 132 filler items for the current experiment.²

The toolkit software we deployed for the current experiment is OpenSesame (Mathôt, Schreij, & Theeuwes, 2012), which means we administrated a lab-based language test (neither an online test nor a pen-and-paper test). Building upon the experimental environment, we implemented two experimental tasks, the five-point Likert Scale task and the binary Yes/No task (henceforth, LS and YN respectively).³

The participants in the current experiment were recruited from three different universities. The number of participants is 264 in total (132 participants for each task).⁴ The participants were requested to judge the acceptability of the sentences presented on the computer screen one by one (1 for ‘least acceptable’ to 5 for ‘best acceptable’ with the LS task, 1 for ‘acceptable’ or 0 for ‘unacceptable’ with the YN task). Each participant responded to 202 stimulus sentences consisting of 40 sentences randomly chosen from the 94 test items plus the other types of sentences. Thus, the ratio of test items to control/filler items is about one fifth. Note that the sampling and ordering in the current experiment were carried out in a way

² As is widely known, many acceptability judgment tests employ the technique of Latin Square so as to attenuate the ordering effect during the test. Nonetheless, it has been also reported that the technique does not necessarily bring benefits. Song & Oh (To appear) experimentally probe into the role of the Latin Square design, and they argue that the Latin Square-based data sometimes have spurious variance. Because the verbs that can convey resultative meanings are few in Korean (and probably in many other languages), we decided not to expand the list of our test items by using the Latin Square method.

³ Regarding the benefit of conducting these two tasks on a single experimental study, see Song & Oh (2017). For the question of why we chose the five-point in the LS task, see Song & Oh (2016).

⁴ The backgrounds of the participants, such as gender, major, hometown, age, etc, were not taken into consideration in the current analysis deferring to the experimental evidence that they do not significantly affect the acceptability judgments (Choe, Oh, & Song, 2017).
of full randomization, and thereby different participants responded to different sets of test items.

After collecting all log files from the series of experiment, we filtered out the slacker participants who did not pay much attention to the stimulus sentences. This filtering task was carried out with reference to how the participants judge the ten control items (Song, Lee, Choe, & Oh, 2017). If a participant answered the items incorrectly three or more times, the participant’s responses were all eliminated from the data table.

The log files that the OpenSesame system provided automatically were converted into a single data table for the statistical analysis. Note that the five-point scale in the LS task was Z-transformed as a way of standardization. On the other hand, the answers in the YN task were counted and calculated as a proportion. In order to visualize the data distribution, the Z-transformed responses in the LS task were represented into a box plot and a density plot sentence by sentence (or pair by pair). Likewise, the proportion of ‘Yes’ and ‘No’ in the YN task was represented into a pie plot and/or a stacked bar plot. As inferential statistics for hypothesis testing, the present analysis employs one-way ANOVA, paired T-test, and Fisher Yate’s Exact (FYE) test. Finally, all analyses made thus far were cumulatively reported into a single PDF file. This workflow operated using a Linux shell script in a fully automatic fashion, which called a series of scripts in Python, R (R core team, 2017), and LaTex.

4. Experimental Results: Adj(ective)-key

In this section we investigate the two hypotheses regarding the syntax of resultative constructions with Adj-key, using the acceptability judgment testing.

4.1. Adj-key: Adjective vs. adverb

We present experimental evidence in support of the hypothesis that
Adj-key is syntactically adverb in Korean resultative constructions. Wechsler & Noh (2001) argues that some Adj-key is adverbial, but others are secondary predicates (i.e., adjectives) using the following coordinations as evidence.

(15) a. kang-i tantanha-key kuliko ppalli el-ess-ta.
    river-Nom solid-Adv and quickly freeze-Pst-Dec
    (lit.) ‘The river froze solidly and quickly.’

    b. ??Kim-un cip-ul ppalkah-key kuliko
        Kim-Top house-Acc red-Key and
        wanchenhi chilha-yess-ta.
        completely paint-Pst-Dec
    (lit.) ‘Kim painted the house red and completely.’

They argue that tantanha-key ‘solid-key’ in (15a) is coordinated with a typical adverb ppalli ‘fast’, and tantanha-key is not predicated of the subject NP; what is solid is the ice, not the river. Thus, tantanha-key ‘solid-key’ should be adverbial. But in (15b) ppalkah-key ‘red-key’ is not coordinated with the degree adverb wanchenhi ‘completely’, and the former is predicated of the matrix object, cip-ul ‘house-Acc’. Thus, they argue that it is a secondary predicate, not an adverb (Wechsler & Noh, 2001: 420). Similarly, Kim & Maling (1997: 192) argue that Adj-key is not adverbial, but predicative. Furthermore, most research on Korean resultative constructions do not explicitly discuss the syntactic category of resultative predicates, and it seems that Korean resultative predicates are generally assumed to be adjective like the resultative predicates (e.g., flat in John hammered the metal flat) in English.

However, we present experimental data suggesting that they are all adverbs syntactically. In particular, the generalization that adverb can be coordinated with only adverb will be used to determine if Adj-key is really adverb or not. First, consider the following examples in which different kinds of adverbs can be coordinated with each other.\textsuperscript{5}
The sentences in (16) seem to be relatively acceptable, and this is supported by the experimental results. In Figure 1, the left two diagrams are the density plot and the box plot that represent the acceptability judgments on the sentences provided in (16). These plots were created on the basis of the judgments with the LS task. The acceptability judgments form a spectrum from −2 (least acceptable) to 2 (best acceptable). On the other hand, the right pie plot represents the judgments with the YN task. The darker the pie plot is, the less acceptable the sentence sounds to participants. Although there

---

5 Note that the numbers in parenthesis in (16) and the subsequent examples refer to the indices of stimulus sentences in the current experiment.
exists some individual variation in the judgments as presented in the plots, it appears that more than a half participants judged the sentences were acceptable.

![Figure 1] Experimental results of #2301 to #2304

Not surprisingly, this experimental result shows that normally an adverb can be coordinated with an adverb, while the two adverbs in the conjuncts can have different kinds of specific meanings (e.g., manner or location).

However, an adverb cannot be coordinated with a phrase with a different syntactic category (e.g., NP), as shown in the following:

   Chelswu-Nom lunch-Acc and fast eat-Pst-Dec
   (lit.) ‘Chelswu ate lunch and fast.’ (2401)

   Chelswu-Nom fast and lunch-Acc eat-Pst-Dec
   (lit.) ‘Chelswu ate lunch and fast.’ (2402)

c. *Chelswu-ka [cemsim-ul kuliko kyonaysiktang-eyse]
   Chelswu-Nom lunch-Acc and cafeteria-at
   mek-ess-ta.
   eat-Pst-Dec
(lit.) ‘Chelswu ate lunch and at the cafeteria.’ (2403)

d. *Chelswu-ka [kyonaysiktang-eyse kuliko cemsim-ul]  
Chelswu-Nom cafeteria-at and lunch-Acc  
mek-ess-ta.  
(lit.) ‘Chelswu ate at the cafeteria and lunch.’ (2404)

The unacceptabilities of the sentences in (17) are supported by the experimental results. Note that the acceptability judgments on the sentences provided in (17) are evaluated as being worse than those provided in (16). Thus, the coordination between different categories has an adverse effect on acceptability.

Based on the contrast between (16) and (17), we assume that an adverb can be coordinated only with an adverb.

With this generalization, we test whether Adj-key is adverb. As illustrated in (18), Adj-key can be coordinated with a manner adverb or a degree adverb. Note that the English translations are all ungrammatical.
An Experimental Study of Resultative Constructions with X-key

(18) a. Minwu-ka changmwun-ul [ppalkah-key kuliko
Minwu-Nom window-Acc red-Key and
chenchen-hi] chilhay-ss-ta.
slow-Adv paint-Pst-Dec
(lit.) ‘Minswu painted the window red and slowly.’ (2101)

b. Minwu-ka changmwun-ul [chenchen-hi kuliko
Minwu-Nom window-Acc slow-Adv and
ppalkah-key] chilhay-ss-ta.
red-Key paint-Pst-Dec
(lit.) ‘Minswu painted the window slowly and red.’ (2102)

c. Minwu-ka changmwun-ul [ppalkah-key kuliko
Minwu-Nom window-Acc red-Key and
wancen-hi] chilhay-ss-ta.
complete-Adv paint-Pst-Dec
(lit.) ‘Minswu painted the window red and completely.’ (2103)

d. Minwu-ka changmwun-ul [wancen-hi kuliko
Minwu-Nom window-Acc complete-Adv and
ppalkah-key] chilhay-ss-ta.
red-Key paint-Pst-Dec
(lit.) ‘Minswu painted the window completely and red.’ (2104)

The acceptabilities of the coordinations in (18) are also supported by the experimental results as shown in Figure 3. The centers of the density line and the box indicate that the sentences sounded fairly good to most participants. As for the YN task, near 90% of participants agreed that the sentences were acceptable.
The experimental results of (18) are even better than those of (16) (协调of adverbia conjuncts). This suggests that Adj-key should be syntactically an adverb, though semantically it is predicated of an NP in resultative constructions.

An adverb specifies an event (e.g., the adverb quickly in He ran quickly modifies the running event). In contrast, an adjective is generally a predicate of an individual (e.g., the adjective ugly in Jane is ugly is predicted of the individual, Jane). Given such a difference, one question arises; if Adj-key is an adverb, how can it be predicated of an individual in resultative sentences. For example, ppalkah-key in Minswu-ka changmwun-ul ppalkah-key chihay-ss-ta ‘Minswu painted the window red’ describes a result state of the entity, the window. Note, however, that English also has a similar expression (see participant-oriented adverbs in Geuder, 2000; Himmelmann & Schultze-Brendt, 2005; Shibagaki, 2011):

(19) a. He loaded the cart heavily.
   b. He decorated the room beautifully.

The words heavily and beautifully in (19) are syntactically adverbs, but they are predicated of the individuals, rather than the events denoted by the verbs.
In (19a) the loading event caused the cart to become heavy, and in (19b) the decorating event caused the room to become beautiful. The adverbs are semantically used as an adjective. A similar syntax-semantics mismatch can be found in (20). In this case, the adjective *tender* seems to semantically behave as an adverb; it describes a manner of loving.

(20) Love me tender.

The data in (19) and (20) indicate that the syntax-semantics mismatch of the kind is not very rare. So it is not very counterintuitive that Adj-*key* is syntactically adverb, but it semantically functions as an adjective. More importantly, the experimental results of the coordination data above empirically support the hypothesis that Adj-*key* is syntactically adverb in the resultative constructions.

4.2. Adj-*key*: Complement vs. adjunct

We present here experimental evidence supporting the hypothesis that Adj-*key* (or the result phrase headed by Adj-*key*) is a complement of the matrix verb in resultative constructions. For instance if the Adj-*key* explicitly appears in the second sentence as shown in (21), the sentence is unacceptable. This unacceptability is supported by the following experimental results. It turns out that the two sentences provided in (21) are judged significantly differently by the participants (T-test: \( p = 1.771008 \times 10^{-12} \), FYE: \( p = 8.933771 \times 10^{-06} \)).

(21) *John-i* phalah-key changmwun-ul chilhay-ss-ta.  
John-Nom blue-Key window-Acc paint-Pst-Dec
*kuliko* Mary-to (*phalah-key) kulay-sst-a.  
and Mary-also blue-Key do so-Pst-Dec
‘John painted a window blue, and Mary did so (*blue).’ (1102)
This suggests that Adj-key should be included in kulay-ss-ta ‘did so’, and so phalah-key ‘blue-Key’ is a complement of the matrix verb chilhay-ss-ta ‘painted’ in the first sentence in (21). In summary, the experimental data in this section support an adverbial complement analysis of Korean resultative constructions with Adj-key.

5. Experimental Results: V(erb)-key

In the previous section, we have discussed the resultative constructions with Adj-key, and empirically supported the two hypotheses about the syntax of the construction. In this section we examine the syntax of resultative constructions with V-key in relation to the two hypotheses.

5.1. V-key: Adjective vs. adverb

As shown previously, adverbs can be coordinated only with adverbs. This generalization of coordination is used here again to examine whether V-key in a resultative construction is an adverb or not. In the following, we can see that V-key can be coordinated with a typical adverb:
(22) a. ku-ka Jane-ul [nemeci-key kuliko kapcaki]  
he-Nom Jane-Acc fall-Key and suddenly  
mil-ess-ta.  
push-Pst-Dec  
‘He pushed Jane suddenly so that she fell.’ (1701)

b. ku-ka Jane-ul [kapcaki kuliko nemeci-key]  
he-Nom Jane-Acc suddenly and fall-Key  
mil-ess-ta.  
push-Pst-Dec  
‘He pushed Jane suddenly so that she fell.’ (1702)

c. ku-ka Jane-ul [nemeci-key kuliko ppalli]  
he-Nom Jane-Acc fall-Key and fast  
mil-ess-ta.  
push-Pst-Dec  
‘He pushed Jane fast so that she fell.’ (1703)

d. ku-ka Jane-ul [ppalli kuliko nemeci-key]  
he-Nom Jane-Acc fast and fall-Key  
mil-ess-ta.  
push-Pst-Dec  
‘He pushed Jane fast so that she fell.’ (1704)

The pie plot in Figure 5 indicates that the sentences in (22) sound acceptable to about a half of participants.
Although slightly more than a half (52%) of the participants negatively answered, many participants (48%) also positively answered. Hence, the experimental results cannot be conclusive to determine whether the sentences in (22) are generally acceptable or not. However, at least we can say that about a half of participants judged that V-key can be coordinated with typical adverbs such as capcaki ‘suddenly’ or ppalli ‘fast’, and this suggests that V-key is syntactically an adverb in their grammars. While V-key and Adj-key belong to the same syntactic category, the semantic difference between them is that the former denotes a result action, but the latter denotes a result state in Korean resultative constructions.

5.2. V-key: Complement vs. adjunct

If the V-key in a resultative construction is a complement of the matrix verb (like Adj-key), we expect that the V-key should not explicitly appear in a do-so sentence. For instance, Figure 6 indicates that there are more participants who accept each of the two sentences in (23) than those who do not accept it.
An Experimental Study of Resultative Constructions with X-key

(23) ku-ka Jane-ul ilese-key tangki-ess-ta.  
   he-Nom Jane-Acc stand-Key pull-Pst-Dec.  

kuliko Sophia-to (*ilese-key) kulay-ss-ta.  
and Sophia-also stand-Key do so-Pst-Dec  

‘He pulled Jane so that she stood up, and Sophia did so (so that she stood up).’ (1105)

However, the results of the experiments using the Likert Scale as shown in Figure 6 show that the sentence without ilese-key ‘stand-Key’ tends to go to the right, but the sentence with ilese-key ‘stand-Key’ tends to go to the left. Thus, overall the do-so test in (23) may suggest that V-key is a complement of the matrix verb. In sum, the experimental results can support an adverbial complement analysis of Korean resultative constructions with V-key.

6. Conclusion

In this paper we have presented experimental data, which support the two syntactic hypotheses about Korean resultative constructions with X-key proposed in Lee (2016): X-key is syntactically an adverb, and X-key or the
result phrase headed by X-key is a complement of the matrix verb of a resultative sentence. In other words, the experimental results suggest an adverbial complement analysis of Korean resultative constructions with X-key. If this analysis is correct, we expect that the result phrase headed by X-key in a clausal resultative construction should be adverbial complement of the main verb. This awaits further research. We also expect that X-key can be replaced by X-tolok in resultative sentences, and we leave for future research the question of whether the resultative constructions with X-tolok are parallel to those with X-key in terms of the syntactic properties discussed in the paper.

References

An Experimental Study of Resultative Constructions with X-key


Juwon Lee (Frist author)
Lecturer
Department of English Language and Literature
Kyung Hee University
26, Kyungheeda-ro, Dongdaemun-gu,
Seoul, 02447, Republic of Korea
02-961-0211
juwonlee@khu.ac.kr

Eunjeong Oh (Co-author)
Associate Professor
Department of English Education
Sangmyung University
20 Hongimun 2-gil, Jongno-gu,
Seoul, Republic of Korea
02-2287-5095
eoh@smu.ac.kr

Sanghoun Song (Corresponding author)
Assistant Professor
Department of English Language and Literature
Incheon National University
119 Academy-ro, Yeonsu-gu,
Incheon, Republic of Korea
sanghoun@inu.ac.kr

Received: August 30, 2018
Revised: October 2, 2018
Accepted: October 15, 2018