Influence of Coerced Input on English Learners' Grammar*

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This study examines if speakers' existing grammar can change after the speakers experience the input that does not match their linguistic knowledge, i.e., the coerced input, on the assumption of the usage-based model. Specifically, sentences that are composed of a ditransitive construction and main verbs requiring various degrees of coercion were created. Korean speakers judged the acceptability of these coerced sentences (Pretest), read the sentences appearing in the passages eight times over four weeks (input sessions), and judged the acceptability of the coerced sentences once again (Posttest). The results are as follows: In the Posttest they judged the coerced sentence that they read in the input sessions more acceptable. Moreover, in the Posttest they generalized the pattern that they received from the input: When they read the sentences that are composed of verbs and NPs different from the input sentences, they judged the sentences more acceptable. The results suggest that recurrent experience of coerced input can change existing grammar of the English learners.

Keywords: coercion, acceptability judgment, usage-based model, grammar change

1. Introduction

In Construction Grammar, coercion is defined as the resolution of semantic incompatibility between a lexical item and a construction in which the lexical item occurs (Croft 1991; Michaelis 2005; Piñango et al. 2006; Ziegeler 2007). For example, the verb *give* is semantically compatible with

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the ditransitive construction (DC) [SUBJ$_i$ [V NP1$_j$ NP2$_k$]] because the meaning of *give* is almost identical to the meaning of the construction in that both indicate 'transfer of possession of *k* from *i* to *j*. On the other hand, *cut* is not compatible with the DC because *cut* typically involves only two arguments (Agent and Patient) and does not involve the meaning of transfer. However, when it is used in the sentence *I cut him a belt* (Yoon 2012; 2013), *cut* is coerced to mean 'to make something by cutting and transfer it to someone,' and the incompatibility is resolved.

The degree of semantic compatibility between a verb and a construction and their coercion are closely related with frequency of usage (Yoon 2012; 2013). Specifically, if a verb is semantically more compatible with a particular construction, their co-occurrence involves less coercion, and they are used more frequently used together. However, this correlation only shows that the grammatical knowledge and language use are correlated. Thus, bi-directional interpretation is possible: A particular verb and a construction are recognized compatible because speakers experience the pattern frequently; the verb and the construction are used together frequently because they are compatible. In other words, the correlation does not indicate whether the frequent usage affects the linguistic knowledge of semantic compatibility.

Regarding the influence of the usage on the grammar, the usage-based model, proposed by Langacker (1988), assumes that linguistic knowledge or grammar is grounded in language use. The model predicts that if expressions of a similar pattern are used together frequently, the pattern is cognitively entrenched as parts of grammar. Following this prediction, we can test the hypothesis that language use affects grammar. Specifically, if speakers continuously experience instances where a verb and a construction are not very compatible, this experience affects the acceptability judgments on the instance where the incompatible verb and construction co-occur. If empirical evidence supports this hypothesis, it strongly suggests that frequency of language use does affect grammar. The current study attempts to show that language use can extend and change grammar. To this end, it investigates to what extent English learners can accept coerced expressions and whether the inputs that are slightly different from

the existing grammar, i.e. coercion, can be generalized as a part of grammar after they recurrently experience coerced expressions.

2. Research Background

2.1. Usage-based Model

In Cognitive Grammar (Langacker 1987; 1988), on which the usage-based model is built, a "schema" is a generalized pattern that speakers extract from similar repeated instances. It is not a mechanism that produces "outputs" as the "rules" do in Generative Grammar. Rather, it serves as symbolic resources which speakers exploit to construct new expressions (Langacker 1988: 132). Schemas function as a device for categorization and specify the properties that the instances have to have in order for them to be valid members of the category. For example, the DC specifies a verb which has the meaning of transfer of possession. In turn, the verb *give* specifies a construction which means transfer of possession, i. e., the DC. We can determine whether or not to combine two linguistic components based on how well the instance where the components occur together is categorized by the schemas of those components. For example, the instance where *give* is used in the DC, such as *I gave John a book*, is categorized as a member of the schema of the DC and the schema of *give* because the instance fits both the constructional schema and the lexical schema. Therefore, we can conclude that *give* and the DC can co-occur with no problem.

There are two kinds of categorizing relationships. One is "elaboration" or "instantiation" of a schema. A schema is elaborated by an instance that conforms to or is compatible with the specifications of the schema. The example of elaboration is *I gave John a book*: It is an instantiation of the *give* schema and the DC schema.

The other kind of categorizing relationship is "extension." In this case, an instance is not perfectly compatible with the schemas but they can be roughly viewed as a member of the same category if we extend the schema. For example, the DC typically specifies a verb of transfer of pos-

session, but *cut* is not an instantiation of these verbs. However, it can be viewed as one of the verbs that can occur in the DC when its meaning is "accommodated." Accommodation is Langacker (1988)'s terminology, which means the adjustment of a component's details when integrated with another incompatible linguistic component. The concept of coercion used in Construction Grammar can be seen as one type of accommodation process. When the meaning of *cut* is accommodated or coerced to mean 'to make something by cutting and transfer it to someone,' it can be used as an extension of the verb schema that occur with the DC.

The elaboration and extension of the schema are related with frequency of language use: If speakers experience similar instances repeatedly, the pattern is entrenched as a schema. The verb *give* or the verbs in the similar class (e.g., *hand* and *lend*) and the DC are used very frequently, and thus their co-occurrence is entrenched and recognized as compatible. On the other hand, *cut* and the DC are not used frequently, and these two are recognized as much less compatible. In short, in the usage-based model, the frequency of language use is important in forming grammar.

Following the assumption of the usage-based model we can make a prediction as follows: If speakers experience the expression where the DC and a less compatible verb such as the cutting verb (e.g., *cut*) are used together, they have to extend the schemas of the DC and the verb or coerce their co-occurrence; they repeatedly coerce the similar instances by accommodating the schemas of this less compatible verb and the DC, the extended schemas can be entrenched. Therefore, the cutting verbs and the DC are recognized more compatible. In other words, the grammar may change in accordance with the frequent input which is modified from the existing grammar.

2.2. Usage-based Model and Language Acquisition

In usage-based approaches to language acquisition (Kidd, Lieven, and Tomasello 2010; Boyd and Goldberg 2009; Year and Gordon 2009; Ellis, O'Donnell, and Römer 2014), grammar is acquired through general-cognitive learning principle, such as categorization and generalization

of the instances, and salience and prototypicality of the input. Thus, the importance of input has been emphasized, and the frequency and the types of the input have been extensively discussed. For example, Goldberg, Casenhiser, and Sethurman (2004) investigated three constructions -- the intransitive motion construction (e.g., *The fly buzzed into the room*), the caused-motion construction (e.g., *Pat sneezed the foam off the cappuccino*), and the DC, and showed that most of the input that children received from their caregivers was skewed towards several general verbs that are used in each construction (e.g. *go, put*, and *give*, respectively). Kidd, Lieven, and Tomasello (2010) also supported exemplar-based learning, showing that children's experimental performance was better when the sentence contained high frequency verbs. These studies show that the verb that is the most frequently used in the construction is representative of other verbs in the similar verb categories, and children acquire the construction based on the most frequent verb. As opposed to these studies, by using a novel construction [V N1 N2] whose novel meaning is "N2 approaches N1," Wonnacott, Boyd, Thomson, and Goldberg (2012) showed that children could generalize the pattern to unfamiliar verbs if the input contains various verbs used in the construction.

Regarding the acquisition of the verb-construction in the second language acquisition, Ellis and Ferreira-Junior (2009) claimed that more typical verb exemplars will contribute to defining the verb categories that the verb belongs to, and this exemplar will be recognized as a prototype of the verb category (Ellis and Collins 2009). Ellis, O'Donnell, and Römer (2014) addressed that prototypical inputs are more advantageous in the verb-argument structure because the prototype occurs the most frequently in usage, and it gets the network centrality, which makes the associated verbs linked with the construction. These studies show that skewed input plays important roles in the verb-construction acquisition. Year and Gordon (2009), however, presented that a more balanced set of verbs facilitated the verb-construction acquisition, which is in line with the findings of Wonnacott, Boyd, Thomson, and Goldberg (2012). In their experiments on Korean children learning English, the children could use the DC with a variety of verbs for a longer time when the inputs were a

balanced set of verbs, compared to when the inputs were skewed towards prototype (e.g. *give* in the DC).

These aforementioned studies on the verb-construction acquisition mainly examine the roles of the inputs in the situation where the speakers initially establish the grammar of the verb-construction. They mostly deal with grammatical inputs (i.e., semantically compatible verbs and constructions), and showed how the grammatical inputs are used (e.g., skewed inputs or balanced inputs) and what roles they play in the first and second language acquisition. However, they do not address how existing grammar can change depending on the inputs. If speakers frequently encounter relatively incompatible verbs-construction co-occurrences, and if these inputs affect speakers' judgments about compatibility, this suggests that the frequent experience of linguistic expressions that do not match speakers' existing grammar does affect their linguistic knowledge and eventually changes grammar. Showing that recurrent experience of the coerced input changes grammar will give some light not only to the studies on language change but also to the studies on the influence of input on L2 learners.

3. Experiment Design

In the experiment, Korean speakers were asked to judge the acceptability of English sentences where a verb was used in the DC ([V NP1 NP2]) as a main verb. The selected verbs varied with regard to the semantic compatibility with the DC. The experiment tested if the sentences of various degrees of compatibility are judged more acceptable when speakers experience these sentences repeatedly, and this increased acceptability in the judgments can be generalized to the cases where the DC is used with other NPs or other verbs in the syntactically / semantically similar verb classes. The prediction is as follows: The input sentences will be judged more acceptable after several times of exposure to the input, and also, the sentences where different NPs or other verbs were used will be judged more acceptable.

The experiment was divided into three parts — preliminary test with native speakers of English (NS), Pretest of acceptability judgments with

non-native speakers (NNS), input sessions where the sentences with different degrees of compatibility were exposed to the NNS, and Posttest of the acceptability judgments with NNS.

3.1. Participants

Fifty eight university students participated in the experiment. They were native speakers of Korean, and have learned English for more than ten years. It is anticipated that NNS can show the influence of the coerced inputs on linguistic knowledge. They have not experienced coercion as much as NS do because their English learning has been focused on acquiring prescriptive grammar while we can find the cases of coercion not infrequently in the NS corpora (Yoon 2012; 2013). Therefore, it is expected that the NNS would hesitate to accept the co-occurrences of less compatible elements and judge the coerced sentences less acceptable than the NS do. If the NNS judge the coerced sentences more acceptable after they are repeatedly exposed to the coerced input despite their linguistic knowledge, the results will strongly suggest that the frequent input does change grammar.

The participants were divided into two Groups, each of which had twenty nine people: Target group which was exposed to the sentences where the DC was used with the main verb of various degrees of compatibility, and Control group which was exposed to the sentences irrelevant to the DC. The students were randomly assigned to one of the two groups.[1)]

Additionally, in order to see if the Korean speakers' coercion is different from the native speakers of English, seven NS participated in the preliminary test. Since the number of NS was not enough for any inferential

1) In the current experiment, the participants' English proficiency was not considered. Prior to this experiment, the same experiment had been conducted considering the students' English proficiency. There were 19 people in each level (i.e. high vs. low) and group (Target and Control). The participating students were different from the current participants. In this previous experiment, the participants received the input four times, which is different from the current experiment in which the participants received input eight times. The result was that there was no significant difference between the groups and between the levels. Thus, in the current experiment, I did not divide the level of proficiency, but instead, I increased the number of participants in each group and the number of input.

statistics, I simply compared the means resulting from the preliminary test of the NS with the means resulting from the Pretest of the NNS.

3.2. Stimuli

The verbs that were to be used in the main verb slot in the DC were selected from the five categories that are divided depending on the degree of semantic compatibility with the DC (Yoon 2012; 2013). Among the verb categories, the verbs of inherent transfer (e.g., *give, send, lend*) were the most compatible with the DC, and the verbs of events internal to the Agent (e.g., *remember, imagine, stay*) were the least compatible. The verbs of possible transfer (e.g., *make, cook, find*), verbs of prevented transfer (e.g., *refuse, deny, decline*), and verbs of impossible transfer (e.g., *cut, slice, break*) were in the middle, respectively. Five verbs were selected, and each of them represented each of the five categories: *give, make, refuse, cut*, and *remember*, respectively.

This verb selection is supported by the frequency of their usage in the DC. According to Yoon (2013), the degree of semantic compatibility was correlated with the frequent usage in the corpus. For example, when the 49 verbs used in the DC in the part of British National Corpus were ranked in the order of frequent usage in the DC, *give* was the first, *make* was the fourteenth, and *refuse* was the thirtieth, while *cut* and *remember* were not used in the DC.

In the experiment, these five verbs were selected and five sentences were created as in (1).

(1) a. Jenny gave me a rose at the restaurant.
    b. Bill *made* her a toy for her birthday.
    c. Sam *refused* her a ring last night.
    d. Jane *cut* him a belt on his birthday.
    e. Beth *remembered* me a watch on their anniversary.

I asked some of the NS participants to paraphrase the sentences in (1). In general, the coerced interpretation was that the subject gave NP2 to

NP1 in the manner of the action designated by the verb. Specific interpretations are given in (2).

(2) a. ----
b. Bill made a toy and gave it to her.
c. Sam refused to give her a ring.
d. Jane cut a belt out of a piece of leather and gave it to him.
e. ----

Note that (1a) does not require a coerced interpretation, and (1e) cannot be coerced at all (i.e., the NS could not comprehend (1e) at all, and judged it 'not acceptable at all' in the preliminary test, which will be discussed in 4.1).

Of the five sentences, (1b) - (1e) were continuously given to the Target group participants in different sixteen passages eight times (following Year and Gordon 2009) during the input sessions. It is controversial whether skewed input or balanced input plays more important roles in generalizing the acquired pattern as was discussed in 2.2. Nevertheless, as the first step to investigate the influence of the coerced input, the input that is used in the current study is skewed to one verb in each category.[2] Note that the sentence with *give* was excluded from the input sessions because it is assumed to be very compatible with the DC, and thus, frequent input of *give* was expected not to affect the acceptability judgments. The subject and the NP1 (Recipient) varied depending on the content of the passage, but the verb and the corresponding NP2 used in (1b) - (1e) were the same throughout the sessions.

To examine if participants can generalize the pattern that they received through the input sessions, in the Pretest and the Posttest, I tested two more sentences for each verb in (1) in which the NP2 varied; one takes the NP2 of edible entity (e.g., *an onion, a cup of tea*) and the other any non-edible entity (e.g., *a table, a knife*). In addition, I selected two more verbs for the verb in each degree of semantic compatibility. When selecting

2) Further study should be followed regarding the influence of coercion when the input is balanced.

these verbs, I referred to the verb classes which were categorized by Levin (1993) according to their similar semantic and syntactic properties. To see the generalization of the input pattern is further extended, two more verbs were added to each of the five verbs in (1); one from the same verb class, and the other from the similar verb class. In Table 1, the verbs used in the stimuli sentences are summarized. The labels in the parentheses follow those of Levin's (1993).

Table 1. The Verbs Used in the Stimuli Sentences

Compatibility Categories	**input verb x 3 (NP2 used in the input / edible / non-edible)**	**Class1 (verbs in the same class)**	**Class2 (verbs in the similar class)**
Verbs of inherent transfer	*give* (*give* verb)	*lend* (*give* verb)	*send* (*send* verb)
Verbs of possible transfer	*make* (*build* verb)	*cook* (*build* verb)	*find* (*get* verb)
Verbs of prevented transfer	*refuse*[3]	*deny*	*decline*[4]
Verbs of impossible transfer	*cut* (verbs of cutting)	*slice* (verbs of cutting)	*break* (verbs of separating)
Verbs of events internal to the Agent	*remember* (*characterize* verb)	*imagine* (*characterize* verb)	*stay* (*exist* verb)

Using the verbs in Table 1, I constructed 25 sentences. A part of the stimuli sentences are given in (1), and the entire stimuli are presented in Appendix 1.

I also added 50 fillers which are not the DC (i.e., caused-motion construction and intransitive construction). The verbs in the filler were also different from Table 1.

3) The verb *refuse* and *deny* were not labeled in Levin (1993, p. 47), but both were categorized as "non-alternating double object only" under "Dative alternation" section.

4) In this study, I included *decline* assuming that it denotes 'prevented transfer.' However, this verb is polysemous, so in Levin (1993) it was labeled as "verbs of caliberatable changes of state." Since the latter meaning is far from the meaning intended by this study, I do not use the label.

3.3. Procedure

First, the 25 stimuli sentences and 50 filler sentences were given to seven native speakers of English. The sentences were randomly ordered. They rated the acceptability of the sentences on seven-point Likert scale — 1 as the most acceptable and 7 as the least acceptable.

Second, fifty eight NNS rated the acceptability the 25 stimuli sentences and 50 filler sentences (Pretest).

Third was the input session. The NNS were divided into two groups: Twenty nine participants were in the Target group and the other twenty nine in the Control group. Four input sessions were conducted for four weeks. In each session, the participants read two sets of passages once a week at the same time of the week at the same place. The passages were selected from Corpus of Contemporary American English, forums, blogs, and book excerpts that were publicized on the website, or newly created.[5] Each passage contained 203 words in average (ranging from 116 words to 252 words). The passages were modified for the purpose of the experiment. One set of the passages was composed of two passages. Each set that the target group read contained the input sentences in (1b-e) where the subjects and NP1s were modified depending on the context but NP2 was equivalent to those of (1b-e). Since there were two sets of passages in each session, the input sentences appeared twice for the Target group. In total, each input sentence was exposed to the participants eight times (1 input per set * 2 sets per session * 4 sessions). Additionally, in each session, there were four filler sentences which were selected from the Pretest, and they were continuously used throughout the sessions so that the participants do not particularly pay attention to the input sentences. On the other hand, the passages that Control group read did not contain the input sentences in (1b-e). Instead, the sentences were deleted or replaced by other sentences.

Fourth, a week after the input sessions, both the Target group and the Control group judged acceptability of the sentences used in the Pretest. The scores from this Posttest were compared with those from the Pretest.

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5) See Appendix 2 for the sources.

3.4. Prediction

The prediction of the comparison of the preliminary test results obtained from the NS and the Pretest results obtained from the NNS is that NNS will not judge the coerced sentences as acceptable as NS do because they have not experienced the sentences with incompatible elements and have learned only prescriptive grammar. Therefore, their judgments would be rather binary: More compatible verbs, such as *give, lend, send, make, cook*, and *find*, would be judged quite acceptable while less compatible verbs, such as *cut, slice, break, remember, imagine*, and *stay*, would be not acceptable at all.

The prediction in the difference in Target group and Control group in Pretest and Posttest is that only the Target group will judge the sentences used in the input sessions (input sentences) more acceptable in the Posttest compared to the Pretest. If the sentences are composed of the input verb and the NP2 of edible (edible NP2 sentences) or non-edible entity (non-edible NP2 sentences), only the Target group will judge them more acceptable in the Posttest because I expect that the participants can generalize the pattern of the input sentences. However, this increased acceptability will not be as great as the case of input sentences because these are slightly different from what they experienced in the input session. For the sentences of Class1 and Class2, only the Target group will judge the sentences more acceptable in the Posttest, but again, the difference will not be as great as the case of input sentences. The Control group will not show difference in the judgments in Pretest and Posttest.

4. Results

4.1. Acceptability of Coerced Sentences: NS vs. NNS

I compared the preliminary test result of the NS with the Pretest result of the NNS (both Target and Control). Since the number of NS was not enough for an inferential statistics, I simply compared mean scores of the sentences obtained from NS and NNS. For descriptive statistics, see Appendix 3. Figure 1 to Figure 5 summarizes the mean of the accept-

ability judgment scores with 1 as the most acceptable and 7 as the least acceptable. The solid line and the dotted line represent the scores of the NS and NNS, respectively.

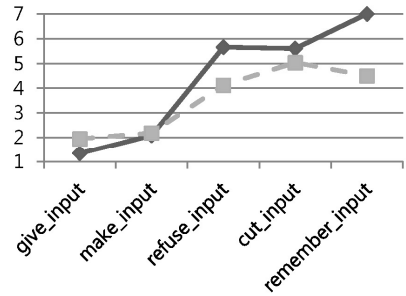

Figure 1. the Mean of input sentences (NS preliminary vs. NNS Pretest).

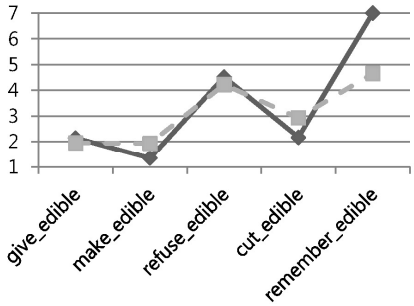

Figure 2. the Mean of the edible NP2 sentences (NS preliminary vs. NNS Pretest).

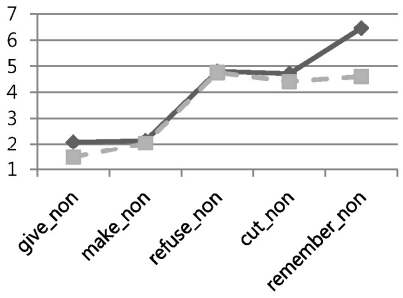

Figure 3. the Mean of the non-edible NP2 sentences (NS preliminary vs. NNS Pretest).

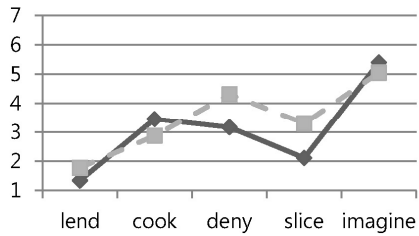

Figure 4. the Mean of Class1 sentences (NS preliminary vs. NNS Pretest).

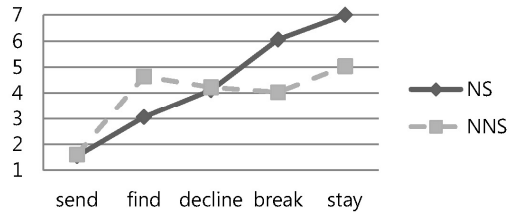

Figure 5. the Mean of Class2 sentences (NS preliminary vs. NNS Pretest).

In Figure 1, Figure 3, and Figure 5, the acceptability scores of the NS gradually increased as the verbs become less incompatible with the DC, which means that the verbs selected in this experiment represent NS's linguistic knowledge about the degree of semantic compatibility: If a verb is less compatible with the construction which the verb occurs in, the sentence where the verb and the construction co-occur is judged less acceptable.

However, if the NP2 was an edible entity, the acceptability was judged better than the sentences with non-edible NP2s, as *make* (*make NP1 a cup of tea*) and *cut* (*cut NP1 a slice of bread*) in Figure 2 show. Also, *slice* in Class1 in this experiment was used with the NP2 of an edible entity (*slice NP1 an onion*), which was judged quite acceptable as in Figure 4. The prediction was that the action of cutting or slicing would damage an entity, and this entity could not be transferred to someone else. However, when it is used with an edible entity, it is easily interpreted as an action of creating something for the purpose of serving. For example, we "create" a slice of bread or slice an onion by cutting it so we can serve it to somebody. As a result of the preliminary test of the NS and the pretest of the NNS,

we can see that the semantic compatibility between a verb and the DC can be different depending on the semantics of the NP2.

Unlike the prediction that the NNS would judge the coerced sentences less acceptable than the NS, the results show that the scores of both groups were relatively similar as can be seen in Figure 1 to Figure 5. Specifically, the scores and the line trend of NS and NNS shown in Figure 1, Figure 2, Figure 3, and Figure 4 are quite similar, unlike the prediction that their judgments will be rather binary. This result implies that NNS might have a similar intuition about the compatibility between the verbs used in the experiment and the DC, which will be discussed in 5.

Interestingly, however, the least compatible sentences were judged more acceptable than the NS did. Except for the least compatible verb in Class1 (i.e., *imagine*) in Figure 4, the scores of the verbs that were expected to be the least compatible with the DC (i.e., *remember* and *stay*) diverged. In other words, the NNS did not entirely reject the incompatible sentences. The prediction was that the NNS would judge incompatible sentences unacceptable. However, the result was that the NNS were careful to judge incompatible verbs entirely unacceptable. It seems that the NNS were not very confident in their linguistic knowledge about the compatibility, and they might have thought that the NS could allow relatively incompatible items to co-occur.

4.2. Comparison of the Pretest and Posttest (Target vs. Control)

The results generally confirmed the prediction that the Target group would judge the input sentences more acceptable in the Postest, and this increased acceptability would be applicable to the edible NP2, non-edible NP2, Class1, and Class2 sentences.

For each sentence group (input, edible NP2, non-edible NP2, Class1, and Class2), Repeated measure of ANOVA was used, in which Trial (Pretest and Posttest) and Verb (five verbs from each compatibility category) were within subject variables and the Group (Target and Control) was a between-subject variable. The result is presented in Table 2.

Table 2. Mean Differences between the Pretest and Posttest for the input Sentences (* for the *p*-value smaller than the significance level adjusted for Bonferroni correction)

input	Target			Control		
	Pre	Post	*t*-test	Pre	Post	*t*-test
give	2.03	1.41	$t(56) = 2.45$, $p = .01$*	1.34	1.86	$t(56) = -1.76$, $p = .04$
make	2.96	2.27	$t(56) = 1.45$, $p = .08$	1.72	2.10	$t(56) = -1.05$, $p = .15$
refuse	4.79	4.00	$t(56) = 2.01$, $p = .02$*	4.14	4.24	$t(56) = -0.23$, $p = .41$
cut	5.00	4.90	$t(56) = 0.30$, $p = .38$	4.86	5.17	$t(56) = -0.71$, $p = .24$
remember	5.41	4.31	$t(56) = 3.27$, $p = .00$*	5.17	4.69	$t(56) = 1.18$, $p = .12$

First, since the statistics in question was whether the Trial (Pretest and Posttest) was different depending on the Group (Target or Control), only the interaction of Trial and Group was examined. The result was that only the input sentences showed significant interaction ($F(1,56) = 6.03$, $p < .05$), whereas the other sentence groups did not. This means that at least for the input sentences, the difference in Pretest scores and Posttest scores was not equal across Target group and Control group. If we look at the difference more closely regarding the input sentences, Pretest scores and Posttest scores were different in Target group (M in Pre = 4.03, M in Post = 3.38, $F(1,28) = 8.36$, $p < .01$) whereas those were not different in Control group (M in Pre = 3.45, M in Post = 3.61, $F(1,28) = .78$, $p = .385$). More specifically, the means of each verb in Pretest and Posttest were compared through the pairwise *t*-test (one-tailed, because the assumption was that the scores would be smaller (i.e., more acceptable) in the Posttest). As a result, Target group showed increased acceptability. In Table 2, the means of the sentences are presented. The significance level was adjusted for sequential Bonferroni correction.[6)]

6) For each group (Target and Control), I conducted five *t*-tests. In order to decrease Type-I error, I adjusted the significance level following sequential Bonferroni correction. For the smallest *p*-value, I applied the significance level of .0100, and for

As we can see in Table 2, for the sentences where the main verbs were *give, refuse*, and *remember*, only the Target group judged the Posttest sentences more acceptable. Although not statistically significant, *make* was judged more acceptable. The Control group did not show significant difference. There were even cases where the score increased (*give, make, refuse*, and *cut*), meaning that the participants judged the sentences in the Posttest less acceptable.

This result suggests that when speakers experience the same expression recurrently, this expression is cognitively entrenched, and judged quite acceptable even though this expression does not perfectly agree with their existing linguistic knowledge.

If this recurrent experience is generalized as a pattern, we should be able to see that the sentences with different NP2s or Class1 verbs and Class2 verbs are judged more acceptable in the Posttest in Target group. Even though there was no effect of interaction of Trial and between-subject variable (Target / Control), when the Repeated Measure of ANOVA was conducted for Target and Control separately, the prediction was supported. Here, Trial (Pretest and Posttest) and Verbs (five verbs from each compatibility category) were within subject variables. I examined if there was a main effect of Trial for Target and Control because the hypothesis was that there was significant difference between Pretest and Posttest. When there was a main effect of Trial, I further conducted one-tailed *t*-tests to compare the difference in Trial for each of the Verbs.

First, for the edible NP2 sentences, the Target group judged the Posttest sentences more acceptable (M in Pre = 3.41, M in Post = 3.03, $F(1, 28) = 4.55$, $p < .05$). Specifically, the sentences with *remember* was significantly different (M in Pre = 5.07, M in Post = 4.28, $t(56) = 2.41$, $p < .01$, significant even with Bonferroni correction). However, the Control group did not show difference (M in Pre = 3.60, M in Post = 3.46, the main effect of Trial, $F(1,28) = .12$, $p = .73$).

Second, for the non-edible NP2 sentences, both Target group (M in Pre = 4.12, M in Post = 3.43, the main effect of Trial, $F(1,28) = 13.81$, $p < .01$) and Control group (M in Pre = 3.39, M in Post = 2.92, the main effect of Trial, $F(1,28) = 12.67$, $p < .01$) showed main effect of

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the next smallest one, .0125, .0167, .0250, and .0500, sequentially.

Trial. However, when examined closely with the *t*-test, the Target group's judgment became more acceptable in the Posttest.

Table 3. Mean Differences between the Pretest and Posttest for the Sentences with non-edible NP2 (* for the *p*-value smaller than the significance level adjusted for Bonferroni correction)

non-edible NP2	Target			Control		
	Pre	Post	*t*-test	Pre	Post	*t*-test
give	2.07	1.55	$t(56) = 1.68$, $p = .01$	1.72	1.41	$t(56) = 1.05$, $p = .15$
make	2.79	2.21	$t(56) = 1.19$ $p = .12$	3.14	1.86	$t(56) = 2.65$, $p = .005$*
refuse	5.55	4.93	$t(56) = 2.26$, $p = .01$*	5.31	4.57	$t(56) = 2.09$, $p = .02$
cut	5.24	4.21	$t(56) = 2.78$, $p = .003$*	5.52	4.62	$t(56) = 2.46$, $p = .01$*
remember	4.97	4.24	$t(56) = 1.85$, $p = .03$	5.00	4.97	$t(56) = .08$, $p = .47$

In Table 3, when the significance level was .05, four verbs (*give, refuse, cut*, and *remember*) were significantly different in Target and three (*make, refuse*, and *cut*) in Control, even though two were significant in both groups after Bonferroni correction.

Third, when the sentences were used with Class1 verbs, the Target group judged the sentences in the Posttest more acceptable (M in Pre = 3.73, M in Post = 3.40, the main effect of Trial, $F(1,28) = 5.44$, $p < .05$) whereas there was no significant difference in Control group (M in Pre = 3.43, M in Post = 3.55, the main effect of Trial, $F(1,28) = .45$, $p = .51$). Specifically, when a verb *slice* was used in the DC, the Target group's score became smaller (M in Pre = 3.76, M in Post = 2.79, $t(56) = 2.00$, $p < .05$), meaning that the Target group's judgment became more acceptable in the Posttest.

Finally, the sentences with Class2 verbs did not show any difference either in the Target (M in Pre = 4.04, M in Post = 4.03, the main effect of Trial, $F(1,28) = .01$, $p = .92$) or in the Control (M in Pre = 3.66, M in Post = 3.79, the main effect of Trial, $F(1,28) = .33$, $p = .57$).

5. Discussion

Though we cannot statistically test the difference between the NS and NNS due to the lack of the number of NS participants, the comparison of the mean in the judgment scores in the preliminary test shows that the NNS accept the coerced sentences similarly with the NS: Both NS and NNS judged more compatible sentences more acceptable. I predicted that the NNS in the experiment would show rather dichotomous judgments (acceptable or not acceptable) because I assumed that most NNS had been exposed to the coerced inputs less frequently than NS. Despite the lack of exposure to the coerced inputs, the result of the NNS was similar to that of the NS. One possible reason for this may be that NNS were not confident in their grammatical knowledge in English, and thus they tended to give more acceptable scores to each sentence than they actually thought. For example they gave the score of 3 to one of the coerced sentence when they actually thought it was 6. Interestingly, for the least compatible sentences, the NNS seemed not very confident enough with their linguistic knowledge about the compatibility to reject the sentences. It means the possibility that the NNS may have more flexible or less firmly established schemas of the verbs and the DC. If they experience coerced expressions more, they may readily accept them.[7)]

Another possible reason for the similar judgment pattern in NS and NNS despite the different frequency of coerced input is that frequency may not be the only crucial factor that affects English learners' grammar. As Yoon (2012, 2013) showed, acceptability judgment scores on the sentences of different degrees of coercion are closely correlated not only with the frequency of the verb-construction co-occurrence but also with the semantic compatibility between the verb and the construction. As for the similar judgment patterns, it is possible that the general knowledge regarding the semantics was an important factor. As Wierzbicka (1996) claimed universality in semantics, the semantic compatibility between English verbs and constructions can be recognized by NNS as well. This may

7) This speculation could have been supported if there had been a follow-up interview with the NNS participants. Unfortunately, the experiment was not followed by an interview.

lead to the NNS's similar judgment patterns with the NS despite the lack of the coerced input. Note, however, that it does not indicate that input is not important in language learning. As the results in the Posttest shows, the input does affect grammar.

The results from the judgments of the NNS confirmed the prediction that the speakers who recurrently experienced a particular coerced expression will accept the expression, and they can generalize a pattern so that they can apply the generalization to similar expressions. On the assumption of the usage-based model, the increased acceptability of the coerced expression implies that speakers manage to extend the existing schema in order to use incompatible items together.

As for the input sentences, the Target group judged relatively incompatible sentences more acceptable after they are exposed to the input sentences several times. This implies that the participants managed to extend their existing schema of the verbs and the DC to use the incompatible elements together, and they became familiar with these coerced expressions.

The acceptability judgments regarding the sentences other than input also suggest the possibility that the speakers manage to make generalization of the coercion. Even though the acceptability difference after the input sessions was not as great as the case of the input sentences, when the NPs varied, the participants seemed to judge the coerced sentences more acceptable. It means that the speakers can extend the schema of the DC and the input verbs relatively comfortably after they became more familiar with the pattern. This generalization extends to the sentences where the main verb is distinct from the input verbs. We could see that the participants judged the Class1 sentences slightly more acceptable in the Posttest although the difference was not as great as the case of the input sentences.

Unfortunately, we could not see any difference in Class2 verbs. Since the Class2 verbs are semantically more distinct from the input verbs than Class1 verbs, the Class2 sentences may require greater extension of the existing schema. This may have led to no difference in acceptability judgments. I expect that even Class2 verbs may be judged more acceptable in the DC if speakers experience more instances of similar pattern of the extension of the verb / construction schema.

It has been claimed that there is a correlation between language use and linguistic knowledge that the verbs that are semantically more compatible with a particular construction are used more frequently, processed more rapidly, and judged more acceptable when they are used in the construction (Yoon 2012; 2013). Expanding from this correlation, the current study further claims that frequent usage of particular linguistic elements (even if they are not perfectly compatible with one another) affects the judgments about their co-occurrence, and ultimately implies that language use changes linguistic knowledge about compatibility.

Coercion has been considered to represent one of the creative and dynamic aspects of language because it creates non-prototypical expressions by combining incompatible linguistic items. If non-prototypical expressions are used frequently, grammar may change slowly over time. For example, *a beer* has been discussed as a case of coercion because *a* specifies an entity of [+bounded] while *beer* is [-bounded] (Michaelis, 2005). In other words, *a* and *beer* are incompatible. When they are used together, however, we can coerce it to mean 'beer in a particular container.' When asked to NS, *a beer* is comfortably used in everyday life and does not require extra processing (Ziegeler, 2007, Author, 2012). Similar examples are used pervasively as in *a coke, a water, a wine*, etc. It seems that *a* can be used with an unbounded entity, especially when it is liquid, and this pattern seems to become entrenched. This leads to the hypothesis that recurrent use of coercion may change grammar eventually. I hope that the increased acceptance of the coerced expressions in this experiment supported this hypothesis.

From the perspective of the second langue acquisition, the result of the current study calls for further study regarding the input quality and frequency. Since English learners have not established their grammatical knowledge and they may not be confident in their knowledge, the input quality is very important (see Ellis et al. (2014) for the prototypicality and salience of the input). Since coerced expressions are not perfectly natural even for the NS, if NNS receive the coerced input excessively, their grammar may gradually deviate from the grammar of NS. Note that the current study aims to show that existing grammar can change

if speakers frequently experience the instances of the extended schemas (i.e. coercion). For this reason, the experiment was designed in the way that the participants experienced the coerced input unusually frequently. This frequent coerced input did affect the grammar, as this study showed. Then, in the second language acquisition, we need to consider the input quality and frequency: Should the learners be given only "grammatical" input or be given the input same as the NS (including coerced expressions with similar frequency)? To study further about input quality and frequency regarding coercion, I suggest considering the following aspects. First, the ratio of coerced input to "grammatical" input must be considered: when coerced input is more frequent than grammatical input (like the current study where "grammatical" input was not given while coerced input was given four times for each passage in the input session); when coerced input is given with the same frequency pattern as found in the corpus (e.g. *give* used in the DC is given 710 times while *earn* used in the DC is given only once (see Yoon 2013)). In addition, the influence of coerced input on NS should be examined because the flexibility towards the extend schema may be different from the NNS.

6. Conclusion

The previous studies on the usage-based approaches to language acquisition have shown that frequent experience of particular linguistic pattern is important in forming grammar. Mostly, both in the first and second language acquisition, the grammar in question was assumed to be the one that the speakers newly acquire. In the current study, however, I examined whether the existing grammar can change after the speakers experience the input that does not match their linguistic knowledge. Specifically, this study created sentences requiring various degrees of coercion: In the sentences, the DC is used with the verbs of various degrees of semantic compatibility. When the speakers read these sentences frequently, they judged the sentences more acceptable. In other words, the speakers extend the schemas of the verbs and the DC so that they can

use them together. Also, the speakers seemed to apply the extended schemas to the sentences where the DC was used with other verbs which were not used as input. The generalization that the speakers showed in the experiment implies that the extended schema may be entrenched as grammar if this pattern is repeated, and presents the possibility that speakers change their existing linguistic knowledge on the basis of the input that they experience.

The current experiment was conducted with the Korean participants, but if it can be conducted with greater number of native speakers over longer period of time, the results will further have a strong implication in how language and grammar change through time.

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Appendix 1

Stimuli
(The sentences in Type "input" were used in the input sessions.)

Type	Verb	Sentence
Input	*give*	Jenny gave me a rose at the restaurant.
	make	Bill made her a toy for her birthday.
	refuse	Sam refused her a ring last night.
	cut	Jane cut him a belt on his birthday.
	remember	Beth remembered me a watch on their anniversary.
edible NP2	*give*	John gave her a piece of cake this evening.
	make	Susan made him a cup of tea last weekend.
	refuse	Sam refused her a beer last night.
	cut	Ron cut her a slice of bread this morning.
	remember	Ron remembered her a meal this morning.
non-edible NP2	*give*	John gave her a pencil this evening.
	make	Susan made him a bag last weekend.
	refuse	Beth refused him a knife last week.
	cut	Ron cut her a mirror on Friday.
	remember	Ron remembered her a shirt this morning.
Class1	*lend*	Matt lent me a pencil yesterday.
(same class)	*cook*	Sam cooked them a meal last evening.
	deny	Julie denied me a drink last night.
	slice	Tom sliced me an onion in the evening.
	imagine	Sam imagined me a house three weeks ago.
Class2	*send*	Julie sent him a letter last year.
(similar class)	*find*	Ben found her a table last night.
	decline	Beth declined him a seat this morning.
	break	John broke me a cracker after lunch.
	stay	Mark stayed her a chair on her birthday.

Appendix 2

The Sources of the Passages Used in the Input Sessions
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<from Corpus of Contemporary American English>

COCA_FIC_ Legerdemain

COCA_MAG_The Untold Jackie

Appendix 3

Descriptive Statistics of the Preliminary Test on Native Speakers (N = 7) and Pretest on Non-native Speakers (N = 58)

Type	Verb	Speakers	Mean	Standard deviation
Input	*give*	NS	1.34	0.15
		NNS	1.95	0.79
	make	NS	2.09	1.57
		NNS	2.19	1.73
	refuse	NS	5.66	1.07
		NNS	4.12	1.84
	cut	NS	5.60	1.57
		NNS	5.03	1.50
	remember	NS	7.00	0.15
		NNS	4.50	1.56
edible NP2	*give*	NS	2.09	2.15
		NNS	1.48	1.23
	make	NS	2.14	0.15
		NNS	2.03	1.45
	refuse	NS	4.80	2.21
		NNS	4.76	1.65
	cut	NS	4.71	1.04
		NNS	4.41	2.10
	remember	NS	6.46	0.00
		NNS	4.60	1.46
non-edible NP2	*give*	NS	2.09	1.07
		NNS	1.48	1.33
	make	NS	2.14	1.63
		NNS	2.03	2.06
	refuse	NS	4.80	1.78
		NNS	4.76	1.26
	cut	NS	4.71	1.75
		NNS	4.41	1.30
	remember	NS	6.46	0.69
		NNS	4.60	1.67

Type	Verb	Speakers	Mean	Standard deviation
Class1 (same class)	*lend*	NS	1.54	0.15
		NNS	1.60	1.22
	cook	NS	3.06	2.19
		NNS	4.64	1.82
	deny	NS	4.11	1.92
		NNS	4.22	1.61
	slice	NS	6.06	1.38
		NNS	4.03	1.92
	imagine	NS	7.00	2.35
		NNS	5.03	1.52
Class2 (similar class)	*send*	NS	1.34	0.57
		NNS	1.78	1.01
	find	NS	3.46	2.42
		NNS	2.88	1.71
	decline	NS	3.17	1.92
		NNS	4.31	1.67
	break	NS	2.11	1.04
		NNS	3.31	1.74
	stay	NS	5.40	0.00
		NNS	5.05	1.50