



English Pseudogapping: An Experimental Perspective

Jungsoo Kim (Kyung Hee University) Sang-Hee Park (Duksung Women's University)



This is an open-access article distributed under the terms of the Creative Commons License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium provided the original work is properly cited.

Received: May 25, 2022

Revised: July 10, 2022

Accepted: July 30, 2022

Jungsoo Kim (first author)
Lecturer, Dept. of English
Linguistics and Literature,
Kyung Hee Univ.
jungsookim@khu.ac.kr

Sang-Hee Park (corresponding
author)
Research Assistant Professor,
Cha Mirisa College of Liberal
Arts, Duksung Women's Univ.
sangheepark@duksung.ac.kr

ABSTRACT

Kim, Jungsoo and Sang-Hee Park. 2022. English pseudogapping: An experimental perspective. *Korean Journal of English Language and Linguistics* 22, 675-694.

The relationship between a construction's frequency of use and its acceptability is a complex issue (Featherston 2005, Lau et al. 2017). Researchers proposed that there is a tight connection between the corpus frequency and acceptability of pseudogapping, e.g., *That music pleased Tim, but it didn't me*. Corpus studies found extremely high proportions of comparative conjunctions (as opposed to coordinate conjunctions like *and* and *but*) and pronominal subjects in the pseudogapped (PG)-clauses that are intended to co-refer with the subjects in the antecedent clauses (Hoeksema 2006, Levin 1980, Miller 2014). In this context, this study investigated the effects of (i) connective type (comparative or coordinate) and (ii) the pronominality of subjects in PG-clauses on acceptability ratings by native English speakers. Results showed that comparative pseudogapping received significantly higher ratings than coordinate pseudogapping, but the ratings for the latter were still in the acceptable range, i.e., around the median of a 7-point scale. Ratings on pronominal vs. proper name subjects in PG-clauses were more complicated than what previous studies suggested based on corpus findings and introspective judgments. In particular, a three-way difference was found between comparative, *and*-, and *but*-structures, showing that effects of subject pronominality crucially depend on the nature of the co-occurring connective. Overall, the present study provides experimental data for further research on ellipsis and offers a more fine-grained understanding of how different factors interact in the perception of pseudogapping sentences.

KEYWORDS

pseudogapping, ellipsis, acceptability judgment, frequency, contrast

1. Introduction

Pseudogapping, illustrated in (1a), is a form of ellipsis in which a main verb goes missing, leaving behind an auxiliary verb and the missing verb's dependents (Gengel 2013, Hoeksema 2006, Jayaseelan 1990, Kubota and Levine 2017, Kuno 1981, Lasnik 1999, Levin 1980, Miller 2014). It is often regarded as a subtype of verb phrase ellipsis (VPE), e.g., (1b), while the name indicates its surface resemblance with gapping, e.g., (1c).

- | | |
|--|----------------------|
| (1) a. That music pleased Tim, but it didn't me. | <i>pseudogapping</i> |
| b. That music might have pleased Tim, but it didn't. | <i>VPE</i> |
| c. That music pleased Tim, and this one me. | <i>gapping</i> |

Ellipsis is one of the hallmarks of natural language. It reveals that communication can be successful only with minimal form that excludes what is redundant or recoverable. In (1a), the verb *pleased* in the *antecedent clause* makes the verb understood in the *pseudogapped* (PG)-clause redundant and hence subject to ellipsis. Besides this common feature of ellipsis, there are also construction-specific properties which naturally lead to a distinction among different types of ellipsis. Pseudogapping, our focus in this study, is a particularly intriguing case with its own constructional properties. As illustrated in (1a), the subject in the antecedent and that in the PG-clause (*PG-subject*) need not be contrastive, and this is one of the crucial features of the construction that distinguishes it from gapping. However, just as in gapping, the *remnant* in the PG-clause and its correspondent in the antecedent clause must be contrastive and cannot co-refer, e.g., *me* vs. *Tim* in (1a). Concerning the overall structural property, the connection between the antecedent and the PG-clause is known to be fairly unrestricted (Levin 1980). It can be one of coordination or comparative subordination as in (2a) and (2b), and the two clauses may even occur as separate utterances as in (2c).

- | |
|---|
| (2) a. It doesn't bother you, but it does me. |
| b. It doesn't bother you as much as it does me. |
| c. Does that bother you? It does me. |

Much research on pseudogapping focused on theorizing the correspondence between the construction's incomplete form with its complete meaning. This has led to several different lines of formal analyses: movement and deletion (Gengel 2013, Jayaseelan 1990, Johnson 2004, Kuno 1981, Lasnik 1995, 1999, Merchant 2008, Takahashi 2004, Thoms 2016); sideward movement (Agbayani and Zoerner 2004); base generation and deletion (Lee 2018); purely interpretive (Miller 1990); type-logical (Kubota and Levine 2017), among others. Fewer studies investigated the construction from an empirical perspective (Hoeksema 2006, Levin 1980, Miller 2014). The empirical research aimed at identifying what linguistic factors influence the production and perception of pseudogapping sentences. Specifically, it provided preliminary results that suggest that connective type and the lexical property of PG-subject are key factors that control the construction's frequency of use and acceptance by native speakers. Regarding frequency, researchers found that there is a strong dominance of pronominal PG-subject and comparative conjunctions among naturally-occurring pseudogapping sentences. They furthermore found that connective type also affects how the construction is judged by native speakers, e.g., pseudogapping in comparative structure is rated higher than that in noncomparative structure (Hoeksema 2006, Levin 1980, Miller 2014).

In this context, the present study attempts to present a more comprehensive investigation of pseudogapping in

English. Using acceptability judgment experiments, we aim to test the factors that are known to influence the acceptability of pseudogapping in the past literature, i.e., effects of connective type and the pronominality of PG-subject. Although there have been attempts to investigate these factors from an empirical perspective, the results were not entirely reliable due to limitations in survey designs, especially in the construction of stimuli. In addition, we aim to examine possible influences of verb type, given the previous claim that the semantic classes of verbs may also affect how speakers perceive and judge pseudogapping sentences (Levin 1980). We furthermore discuss the results of our experiments in the context of an ongoing discussion on the relationship between acceptability and frequency (An and Abeillé 2021, Bermel and Knittl 2012, Featherston 2005, Keller 2000, Kempen and Harbusch 2005, Lau et al. 2017), and also in connection with other types of ellipsis, e.g., gapping.

The rest of this paper is organized as follows. In Section 2, we discuss in more detail the key factors known to influence the usage and acceptability of pseudogapping sentences and then motivate a new experimental study that measures the effects of those factors. In Section 3, we present the designs of our experiments, i.e., a norming test and two judgment experiments testing the factors discussed above and report the results of these experiments. General discussion on the findings from the experiments and a summary of the paper are provided in Section 4.

2. Frequency and Acceptability

As noted above, previous research reported that pseudogapping has a strong bias toward comparative structure in terms of frequency of occurrence and speakers' acceptability judgments (Agbayani and Zoerner 2004, Boeckx 2000, Hoeksema 2006, Kubota and Levine 2017, Lasnik 1995, 1999, Levin 1980, Miller 2014, Zoerner and Agbayani 2002). An extensive study on the frequency of pseudogapping is presented in Miller (2014). It is based on the data from COCA (Corpus of Contemporary American English; Davies 2008-).¹ One notable finding of the study is the huge imbalance in proportion between comparative and noncomparative pseudogapping. That is, of the 1,415 examples of pseudogapping in COCA, 1,368 cases were in a comparative structure (96.7%) while only 47 occurred in a noncomparative environment. The noncomparative type included coordinate and subordinate structures and the 'discourse type' such as (2c). In addition, the majority of pseudogapping sentences involved a pronominal PG-subject, i.e., overall, 94% cases had a pronominal subject in the PG-clause (1,243 and 46 in comparative and noncomparative pseudogapping, respectively). The dominance of pronominal PG-subjects was reported to be stronger in the spoken register: 97.8% and 89.8% PG-subjects were pronouns in the spoken and written register, respectively.

Corpus data reveal information that is not accessible through introspection alone, such as frequency, dispersion, and context of usage. In one view, a construction's frequency of use correlates with its cognitive persistence, i.e., entrenchment. That is, the more one is exposed to a given construction, the more easily it is accessed and processed (Bybee 2007, Ellis 2002, Tomasello 2003). However, studies also showed that patterns in corpus data may not truly reflect how a construction is perceived by speakers. A construction that is rarely found in corpora may still be perceived as acceptable and natural (Bermel and Knittl 2012, Featherston 2005, Kempen and Harbusch 2005).

¹ Miller's corpus data consist of pseudogapping sentences with NP remnants. They therefore exclude remnants of other categories that are permitted in pseudogapping (examples due to Zoerner and Agbayani 2002):

- (i) a. I can depend on Merle, but I can't [_{PP} on Sandy].
- b. Kim wouldn't behave nobly, but she would [_{ADV} wisely].
- c. I would say that Dana is misguided more than I would [_{CP} that she's wrong].

In the case of pseudogapping, previous findings suggest that its frequency is closely related to how it is judged by human raters (Hoeksema 2006, Levin 1980, Miller 2014, fn. 7). A pilot study by Levin (1980: 84) revealed that speaker judgments on pseudogapping sentences are critically influenced by connective type, showing that comparative structures are more favored than noncomparative ones. In Hoeksema's (2006) rating study, the grammatical properties of remnants were also tested, using stimuli such as (3a)-(3d) (emphasis in the original). In particular, first, direct objects were predicted to be more acceptable than predicative remnants, and second, comparatives were predicted to be more acceptable than noncomparative structures.² These predictions were reported to be confirmed: the mean ratings were 8.4, 4.4, 4.6, and 2 for the conditions (3a)-(3d) on a scale of ten. However, it should be pointed out that Hoeksema's study was not formally designed to assess the variables intended to be tested. More specifically, the stimuli for judgment were not controlled for lexical choices, and no fillers were added to prevent the subjects from noticing the critical manipulations (see Section 5.3 and Appendix A in Hoeksema (2006) for stimuli and further details). It therefore remains to be seen whether the previous findings would still be confirmed by a psycholinguistic experiment designed to test the same variables.

- (3) a. Comparative + direct object remnant
Mary made as many WOMEN happy as she did MEN.
- b. Comparative + predicate remnant
Let's make as many people HAPPY as we do UNHAPPY.
- c. Noncomparative + direct object remnant
Jackie likes the SALESMAN, but she doesn't the STOCKBROKER.
- d. Noncomparative + predicate remnant
Jackie finds the salesman CLEVER, but she doesn't ATTRACTIVE.

With regards to the pronominality of PG-subject, its influence on acceptability judgment has not yet been subject to a careful experimental investigation. Nevertheless, some introspective judgements were reported in the theoretical literature. For example, Kubota and Levine (2017: 215-216) observe that pseudogapping sentences sound better with a pronominal PG-subject than with a nonpronominal one, which predicts a general preference for the examples in (4) to those in (5) by native speakers. Kubota and Levine's judgments on those sentences are more subtle, as shown in (4) and (5). This is explained by assuming a degree of compatibility between pseudogapping and the conjunction; namely, pseudogapping is most compatible with a comparative conjunction, less with a contrastive *but*, and least compatible with *and*.

- (4) a. John will write essays much more successfully than he will novels.
b. %John won't write essays but he will novels.
c. %%John will write essays and he will novels.
- (5) a. %%John will write essays but Mary will novels.
b. %%%John will write essays and Mary will novels.

Linguists' judgments are valuable data that can provide a basis for theoretical research. Indeed, Kubota and

² The first predictor, i.e., direct object vs. predicative complement, is grounded on a theoretical assumption that a complex predicate consisting of a verb and its predicative complement (e.g., *find (someone) attractive*) forms a discontinuous constituent, which is amenable to a deletion-based account. We thank an anonymous reviewer for directing us to this point.

Levine argue that the preference for comparative conjunctions and *but* is due to a discourse condition, i.e., the *Contrast* relation in the sense of Kehler (2002). They argue, for example, that (4b) is more acceptable than (4c) because the contrastive conjunction *but* helps support the Contrast relation needed for the licensing of pseudogapping sentences. However, no empirical data have yet been made available that would confirm the judgments of Kubota and Levine.

To summarize, previous corpus findings presented testable predictions with regards to what factors might influence the acceptability of pseudogapping sentences, i.e., connective type and the pronominality of PG-subject. Initial results from previous studies showed a fairly strong bias in acceptability ratings toward comparative structure, a finding that supports the view that frequency and acceptability are highly related. But this result is not entirely reliable due to the limitations in survey designs noted above. Moreover, no experimental data have been made available that would clarify whether the pronominality of PG-subject can also condition the acceptability of pseudogapping sentences. Also, some argued that effects of connective type and the pronominality of PG-subject are cumulative (Kubota and Levine 2017), but the claim is without sufficient empirical support. The semantic classes of verbs are another factor known to influence speakers' acceptance of pseudogapping sentences (Levine 1980), but their effect alone or their potential interaction with other factors were yet to be tested empirically. Our experiments, presented in the next section, are aimed at exploring all these possible factors.

3. Experiments

Three acceptability judgment experiments (one norming experiment and two main experiments) were conducted to examine effects of the three factors discussed above: connective type, pronominality of the PG-subject, and verb type. The goal of the norming experiment was to make unbiased pseudogapping sentences for the two main experiments, using full sentences with a 2 x 3 factorial design: CONNECTIVE TYPE (*And*-Coordination vs. Comparative) x VERB TYPE (Action vs. Psych vs. State). The first main experiment was carried out to investigate how and to what extent connective types and PG-subject types affect the acceptability of pseudogapping sentences, using a 2 x 2 factorial design: CONNECTIVE TYPE (*And*-Coordination vs. Comparative) x PG-SUBJECT TYPE (Name vs. Pronoun). On the other hand, the second main experiment was performed to test how and to what extent polarity difference between the antecedent and PG-clauses and PG-subject types affect the acceptability of pseudogapping sentences, using a 2 x 2 factorial design: CONNECTIVE TYPE (*And*-Coordination vs. *But*-Coordination) x PG-SUBJECT TYPE (Name vs. Pronoun). In both main experiments, the effect of verb types was also tested.

3.1 Norming Experiment

As noted in previous literature, judgments on pseudogapping examples are rather unstable, since this ellipsis phenomenon is often viewed as marginal and informal and thus they vary among speakers of English (Hoeksema 2006, Kubota and Levine 2017). A norming experiment was conducted to select unbiased "source sentences" from which main experiment items were to be constructed, i.e., pairs of full and elided sentences that vary in connective type (*and* vs. comparative).

3.1.1 Participants

Eighty participants, all self-reported native speakers of English, were recruited on Amazon Mechanical Turk (AMT). They were geolocated as US-based and have completed over 100 HITs ('Human Intelligent Tasks', i.e., AMT tasks) with 95% approval rating or higher. One participant, who failed to provide a unique survey code needed to retrieve his or her results, was removed from the dataset. The remaining participants were then screened for attentiveness. Fifty-four were removed from the dataset, who failed to pass comprehension questions and/or provided random answers (e.g., selecting 7 'fully acceptable' for all items).³ This data filter-out process left data from 25 participants. We checked each participant's AMT Worker ID and IP address and made sure that none of these participants completed the norming experiment more than once. Upon successful completion of the experiment, each participant was compensated \$1.5 for their time and participation.

3.1.2 Task

In a 7-point Likert scale acceptability judgment task, participants were presented with sentences on a computer screen. They were then asked to rate the acceptability of each sentence by clicking on a number between 1 and 7 (1: fully unacceptable, 7: fully acceptable).

3.1.3 Design and materials

To construct the stimuli, we chose three sets of verbs based on Levin (1980), i.e., action, psych, and state verbs ($n = 10$ each). Then, we constructed two types of sentences for each verb: one with the coordinating conjunction *and* and the other with a comparative conjunction that is semantically plausible in the context of the given verb, e.g., *more effectively* for a sentence with the verb *help*. This resulted in 60 sentences in total. As an illustration, consider the sample sets of test items below:

- (6) a. Scarlet helped the intern and James helped the boss. (*And*-Coordination, Action)
- b. Scarlet helped the intern more effectively than James helped the boss. (Comparative, Action)
- (7) a. Joan amazed the audience and Nora amazed the judges. (*And*-Coordination, Psych)
- b. Joan amazed the audience more than Nora amazed the judges. (Comparative, Psych)
- (8) a. Noah hated the terrorists and Sofia hated the communists. (*And*-Coordination, State)
- b. Noah hated the terrorists more than Sofia hated the communists. (Comparative, State)

Here, the (a) and (b) examples in each pair differ in terms of connective types in that the former is an *and*-coordination sentence while the latter is a comparative sentence. Meanwhile, the examples in (6) contain an action verb, those in (7) a psych verb, and those in (8) a state verb.

³ Ten comprehension questions were created and included in the experiment as a measure of participants' attentiveness. Each of them was presented immediately after a filler item. For example, once the participant read the filler sentence *Susan studied math hard although not biology* and clicked on a number on the screen to rate it, the comprehension sentence *Susan studied English hard* appeared. Participants then had to click *Yes* or *No* to move onto the next sentence. The minimum level of accuracy required was 80%, i.e., answering eight out of ten questions correctly.

In addition to these test items, 60 filler items were constructed, all of which are irrelevant to the current experiment.

3.1.4 Procedure

The norming experiment was implemented on a web-based platform, PCIBex Farm (Zehr and Schwarz 2018). Participants went through a training session with three practice trials with guiding information (one fully acceptable sentence, one fully unacceptable sentence, and one in-between sentence) and seven more practice trials without guiding information, two of which were followed by a sentence comprehension question (a simple *yes/no* question like the one exemplified in footnote 3). After this training session with the 10 practice trials, they were then presented with 60 test items and 60 filler items in a uniquely generated random order. Ten filler items were followed by a sentence comprehension question in the middle of the main experiment (e.g., after judging the acceptability of *Bill ate rice and so did Harry*, deciding whether the sentence *Harry ate rice* is true or false).

3.1.5 Results

We checked the mean acceptability rating of each test item and calculated the mean acceptability rating difference between the *and*-coordination item and its comparative counterpart. For each verb type, we then selected eight pairs with the smallest mean acceptability rating differences. Overall, the mean acceptability ratings of these six conditions were similar, ranging from 5.55 to 5.71, although the mean acceptability rating of the *and*-coordination condition was slightly higher than that of its comparative counterpart in each pair.

We performed a linear mixed-effects analysis of the participants' acceptability ratings with CONNECTIVE TYPE and VERB TYPE as fixed effects and PARTICIPANT and ITEM as random effects in R (R Development Core Team 2018), via the *lmer* function in the *lme4* package (Bates et al. 2015). In order to obtain *p*-values, we conducted likelihood ratio tests of the full model with the effect in question against the reduced model without it, following regular recommendations for linguistic analysis (Winter 2013).

From the analysis, we first found no main effect of CONNECTIVE TYPE ($\chi^2(1) = 0.9285, p = 0.3353$; Estimate = -0.05000, *SE* = 0.05192, *t* = -0.963) such that overall *and*-coordination sentences were not rated significantly differently from comparative sentences regardless of the verb types involved. We also found no main effect of VERB TYPE ($\chi^2(2) = 2.5266, p = 0.2827$) such that sentences with action, psych, and state verbs were not rated significantly differently regardless of whether they involved an *and*-coordination structure or a comparative structure. Furthermore, we found no main effect of the interaction of the two factors ($\chi^2(2) = 0.13, p = 0.937$).

We then performed post-hoc comparisons, using the R package *emmeans* (Lenth et al. 2018) with the Kenward-Roger approximation for degrees of freedom and the Tukey *p*-value correction. The analysis revealed that no pairs reached a statically significant difference in terms of their mean acceptability ratings. In constructing the test pseudogapping items for Experiments 1 and 2, we, therefore, manipulated these full clause sentences.

3.2 Experiment 1

As discussed above, the previous theoretical literature and corpus-based observations have shown that pseudogapping favors particular structural environments such as comparative structures over coordination structures and pronominal PG-subjects over non-pronominal PG-subjects. In this experiment, we tested to what extent connective types and pronominality of the PG-subject affect the acceptability of pseudogapping sentences,

using a 2 x 2 factorial design: CONNECTIVE TYPE (*And*-Coordination vs. Comparative) x PG-SUBJECT TYPE (Name vs. Pronoun).

3.2.1 Participants

Ninety-one self-reported native speakers of English were recruited via Amazon Mechanical Turk (AMT). They were required to be US residents and to have at least 95% approval rating for more than 100 completed tasks. One participant was removed from the dataset, since we could not find his/her results on the basis of the survey code provided whereas fifty-eight were removed from the dataset for the same reasons described in Section 3.1.1, leaving 32 participants in the analysis. We used the built-in Block function in AMT to prevent individuals from participating in our experiments more than once. We checked each participant's Worker ID and IP address and confirmed that none of the 32 participants participated in the norming experiment and completed Experiment 1 more than once. Upon successful completion of the experiment, each participant was paid \$1.5 for participation.

3.2.2 Task

Just like the norming experiment, in a 7-point Likert scale acceptability judgment task, participants were presented with sentences on a computer screen. They were then asked to rate the acceptability of each sentence by clicking on a number between 1 and 7 (1: fully unacceptable, 7: fully acceptable)

3.2.3 Design and materials

Two within-subjects factors were crossed to construct four different conditions for each set: CONNECTIVE TYPE (*And*-Coordination vs. Comparative) x PG-SUBJECT TYPE (Name vs. Pronoun). A sample set of test items is shown in (9) below:

- (9) a. Madeline taught the juniors and Eva did the seniors. (*And*-Coordination, Name)
 b. Madeline taught the juniors and she did the seniors. (*And*-Coordination, Pronoun)
 c. Madeline taught the juniors better than Eva did the seniors. (Comparative, Name)
 d. Madeline taught the juniors better than she did the seniors. (Comparative, Pronoun)

The examples in (9a) and (9b) involve an *and*-coordination structure whereas those in (9c) and (9d) involve a comparative structure. In the meantime, the examples in (9a) and (9c) contain a proper name PG-subject which is in a contrastive relation with the subject of the antecedent clause while those in (9b) and (9d) contain a pronoun PG-subject which is understood to be coreferential with the subject of the antecedent clause.

For Experiment 1, 24 sets of quadruples were created, following the patterns illustrated in (9), with the manipulation of the full clause sentences from the norming experiment. The resulting 96 test items were counterbalanced to four distinct lists, using a Latin Square design. Then, 48 filler items of varying acceptability were added to each list. The filler items included sentences that involve the verb phrase ellipsis (VPE) construction, (e.g., *Bill ate rice and so did Harry*), the gapping construction in a subordinating clause (e.g., *Levi ate a burger because Mila a salad*), the negative stripping construction introduced by *while* (e.g., *Tammi swallowed the pills while not Jason*), and so on, which are not relevant to the experiment.

3.2.4 Procedure

Just like the norming experiment, Experiment 1 was also implemented on PCIBex Farm and participants began the experiment with 10 practice trials. After the training session, they were presented with 24 test items and 48 filler items in a uniquely generated random order. In the middle of the main experiment, they were also asked to provide their answers to sentence comprehension questions about 10 filler items.

3.2.5 Findings

Figure 1 provides the mean acceptability ratings with standard error bars for the four conditions in Experiment 1:

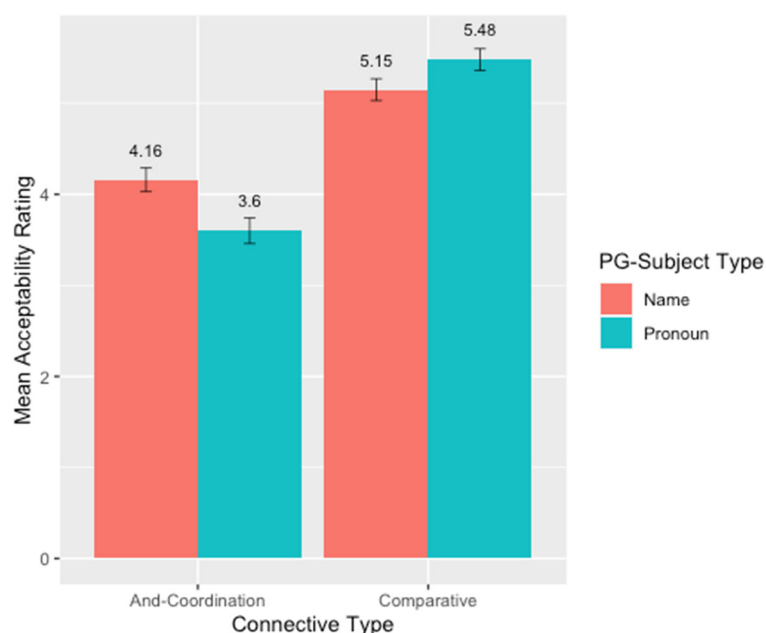


Figure 1. Mean Acceptability Ratings with Standard Error Bars for the Four Conditions in Experiment 1

The results here first showed that overall the mean acceptability ratings of pseudogapping sentences with a comparative structure were higher than those of pseudogapping sentences with an *and*-coordination structure (5.48 ($se = 0.12$) for the CompPro condition as in (9d) > 5.15 ($se = 0.12$) for the CompName condition as in (9c) > 4.16 ($se = 0.13$) for the AndCoordName condition as in (9a) > 3.6 ($se = 0.14$) for the AndCoordPro condition as in (9b)). Another observation we can make here is that the mean acceptability rating of comparative pseudogapping sentences with a pronoun PG-subject was higher than that of comparative pseudogapping sentences with a proper name PG-subject (5.48 ($se = 0.12$) for the CompPro condition as in (9d) > 5.15 ($se = 0.12$) for the CompName condition as in (9c)) but the reverse pattern was found with *and*-coordination pseudogapping sentences (4.16 ($se = 0.13$) for the AndCoordName condition as in (9a) > 3.6 ($se = 0.14$) for the AndCoordPro condition as in (9b)).

We performed a linear mixed-effects analysis of the participants' acceptability ratings, with CONNECTIVE TYPE and PG-SUBJECT TYPE as fixed effects and PARTICIPANT and ITEM as random effects. As in the norming experiment,

we obtained p -values, using the likelihood ratio tests of the full model with the effect in question against the reduced model without the effect in question (Winter 2013).

From the analysis, we found a main effect of CONNECTIVE TYPE ($\chi^2(1) = 77.009, p < 0.0001$; Estimate = 1.4375, $SE = 0.1326, t = 10.84$) such that overall comparative pseudogapping sentences were rated higher than *and*-coordination pseudogapping sentences regardless of whether they contained a proper name or pronoun PG-subject. However, we found no main effect of PG-SUBJECT TYPE ($\chi^2(1) = 0.7589, p = 0.3837$; Estimate = -0.1146, $SE = 0.2000, t = -0.573$) such that overall pseudogapping sentences with a pronoun PG-subject were not rated significantly differently from those with a proper name PG-subject irrespective of whether they involved an *and*-coordination structure or a comparative structure. In addition, we found a main effect of the interaction of the two factors ($\chi^2(1) = 12.137, p < 0.001$).

To find out precisely where the differences stem from, we performed post-hoc pairwise comparisons, using the R package *emmeans* (Lenth et al. 2018) with the Kenward-Roger approximation for degrees of freedom and the Tukey p -value correction. The results of post-hoc comparisons between conditions are presented in Table 1 below:

Table 1. Post-hoc Pairwise Comparisons between Conditions in Experiment 1

Contrast	Estimate	SE	df	t.ratio	p.value
AndCoordName - CompName	-0.995	0.177	95.5	-5.623	< 0.0001
AndCoordName - AndCoordPro	0.557	0.177	95.5	3.150	0.0115
CompName - CompPro	-0.328	0.177	95.5	-1.855	0.2546
AndCoordPro - CompPro	-1.880	0.177	95.5	-10.628	< 0.0001

The analysis revealed, first, that pseudogapping sentences were rated significantly higher when they occurred with a comparative structure than with an *and*-coordination structure, irrespective of the subject type. Second, while the linear mixed-effects analysis showed no main effect of PG-SUBJECT TYPE, the post-hoc analysis found a significant mean acceptability rating difference between pronoun and proper name PG-subject conditions for *and*-coordination pseudogapping sentences. That is, *and*-coordination pseudogapping sentences were rated higher when the PG-subject was a proper name than when it was a pronoun. However, no significant mean acceptability rating difference was found between pronoun and proper name PG-subject conditions for comparative pseudogapping sentences.

Recall, at this point, that Levin (1980) argues that unlike comparative pseudogapping sentences, coordination pseudogapping sentences favor psych verbs. To test this, we also checked the mean acceptability rating and standard error for each condition by verb type and the results are presented in the following table:

Table 2. Mean Acceptability Ratings and Standard Errors for the Conditions by Verb Type in Experiment 1

Condition	Verb	Mean	SE	Condition	Verb	Mean	SE
AndCoordName	Action	4.19	0.24	CompName	Action	4.88	0.22
AndCoordName	Psych	4.03	0.22	CompName	Psych	5.16	0.20
AndCoordName	State	4.25	0.23	CompName	State	5.42	0.19
AndCoordPro	Action	3.53	0.22	CompPro	Action	5.38	0.21
AndCoordPro	Psych	3.72	0.24	CompPro	Psych	5.50	0.19
AndCoordPro	State	3.55	0.25	CompPro	State	5.56	0.21

The results here showed that *and*-coordination pseudogapping sentences were rated slightly lower with a psych verb than with the other two verb types when they contained a proper name PG-subject while they were rated slightly higher with a psych verb than with the other two verb types when they contained a pronoun PG-subject. The results here also showed that comparative pseudogapping sentences with a psych verb were rated slightly higher than those with an action verb but slightly lower than those with a state verb, regardless of whether they contained a proper name or pronoun PG-subject.

We then performed post-hoc pairwise comparisons to find out whether their mean acceptability rating differences were statistically significant and the results are shown below:

Table 3. Post-hoc Pairwise Comparisons between Verb Types in Each Condition in Experiment 1

Contrast	Estimate	SE	df	t.ratio	p.value
AndCoordNameAction - AndCoordNamePsych	0.1562	0.313	105	0.500	0.9961
AndCoordNameAction - AndCoordNameState	-0.0625	0.313	105	-0.200	1.0000
AndCoordNamePsych - AndCoordNameState	-0.2188	0.313	105	-0.699	0.9816
AndCoordProAction - AndCoordProPsych	-0.1875	0.313	105	-0.599	0.9909
AndCoordProAction - AndCoordProState	-0.0156	0.313	105	-0.050	1.0000
AndCoordProPsych - AndCoordProState	0.1719	0.313	105	0.549	0.9939
CompNameAction - CompNamePsych	-0.2812	0.313	105	-0.899	0.9459
CompNameAction - CompNameState	-0.5469	0.313	105	-1.748	0.5034
CompNamePsych - CompNameState	-0.2656	0.313	105	-0.849	0.9574
CompProAction - CompProPsych	-0.1250	0.313	105	-0.400	0.9987
CompProAction - CompProState	-0.1875	0.313	105	-0.599	0.9909
CompProPsych - CompProState	-0.0625	0.313	105	-0.200	1.0000

As can be seen here, no pairs reached a statistically significant difference with respect to their mean acceptability ratings, indicating that different verb types did not affect the acceptability of *and*-coordination and comparative pseudogapping sentences in each condition in this experiment.

The findings of Experiment 1 first showed that overall pseudogapping sentences were rated statistically significantly higher with a comparative structure than with an *and*-coordination structure, which is consistent with the introspection-based judgments and their frequency difference observations in corpus data noted in previous literature (Hoeksema 2006, Kubota and Levine 2017, Levin 1980, Miller 2014). On the other hand, effects of PG-subject did not match what can be predicted from previous studies (Hoeksema 2006, Kubota and Levine 2017, Levin 1980, Miller 2014). As for comparative pseudogapping, no significant difference was obtained between pronoun and proper name PG-subjects. A more striking result was found with *and*-coordination pseudogapping: pronoun PG-subjects lowered rather than increased the acceptability ratings of pseudogapping sentences. Furthermore, the findings of Experiment 1 revealed that pseudogapping sentences were not rated statistically significantly higher with a psych verb than with an action or state verb in each condition, contra Levin (1980).

3.3 Experiment 2

The findings of Experiment 1 about the acceptability of pseudogapping sentences partially support the introspection-based judgments and corpus-based frequency observations made in previous literature. In Experiment 2, we tested how and to what extent polarity difference between the antecedent and PG-clauses and

PG-subject types affect the acceptability of pseudogapping sentences, using a 2 x 2 factorial design: CONNECTIVE TYPE (*And*-Coordination vs. *But*-Coordination) x PG-SUBJECT TYPE (Name vs. Pronoun).

3.3.1 Participants

Participants were 156 self-reported native speakers of English, who were recruited through Amazon Mechanical Turk. They were required to be US residents with at least 95% approval rating and 100 or more approved HITs. Three participants were removed from the dataset for not providing a unique survey code while 121 were removed from the dataset due to the reasons described in Section 3.1.1, leaving 32 participants in the analysis. After using the built-in Block function in AMT and checking each participant Worker ID and IP address, we confirmed that none of these 32 participants participated in the norming experiment and Experiment 1 and none of them completed Experiment 2 more than once. Upon successful completion of the experiment, each participant was paid \$1.5 for participation.

3.3.2 Task

An acceptability judgment task with a 7-point Likert scale was used as in the norming experiment and Experiment 1.

3.3.3 Design and materials

Two within-subjects factors were crossed to create four conditions for each set: CONNECTIVE TYPE (*And*-Coordination vs. *But*-Coordination) x PG-SUBJECT TYPE (Name vs. Pronoun). A sample set of test items is presented in the following:

- (10) a. Madeline taught the juniors and Eva did the seniors. (*And*-Coordination, Name)
 b. Madeline taught the juniors and she did the seniors. (*And*-Coordination, Pronoun)
 c. Madeline taught the juniors but Eva didn't the seniors. (*But*-Coordination, Name)
 d. Madeline taught the juniors but she didn't the seniors. (*But*-Coordination, Pronoun)

Note first here that the examples in (10a) and (10b) are the same ones used in Experiment 1, both of which involve an *and*-coordination structure. These two examples differ in that the example in (10a) contains a proper name PG-subject but the one in (10b) contains a pronoun PG-subject. On the other hand, the examples in (10c) and (10d) both involve a *but*-coordination structure and the PG-clause also has a negative polarity value unlike their antecedents. In addition, these two examples are different in that the example in (10c) has a proper name PG-subject but the one in (10d) has a pronoun PG-subject.

For Experiment 2, 24 sets of quadruples were constructed, following the patterns demonstrated in (10). Half of the 96 test items with an *and*-coordination structure as in (10a) and (10b) were the same in Experiment 1 but the remaining half involved a *but*-coordination structure as in (10c) and (10d). The former had a polarity match but the latter had a polarity difference between the antecedent and the PG-clauses. These 96 test items were distributed to four distinct lists with a Latin Square design and the same 48 filler items used in Experiment 1 were added to each list.

3.3.4 Procedure

As in the norming experiment and Experiment 1, Experiment 2 was also hosted on PCibex Farm and after a training session with 10 practice trials, participants were presented with 24 test items and 48 filler items in a uniquely generated order. During the main experiment, they were asked to answer *yes/no* sentence comprehension questions about 10 filler items.

3.3.5 Findings

Figure 2 summarizes the mean acceptability ratings with standard error bars for the four conditions in Experiment 2:

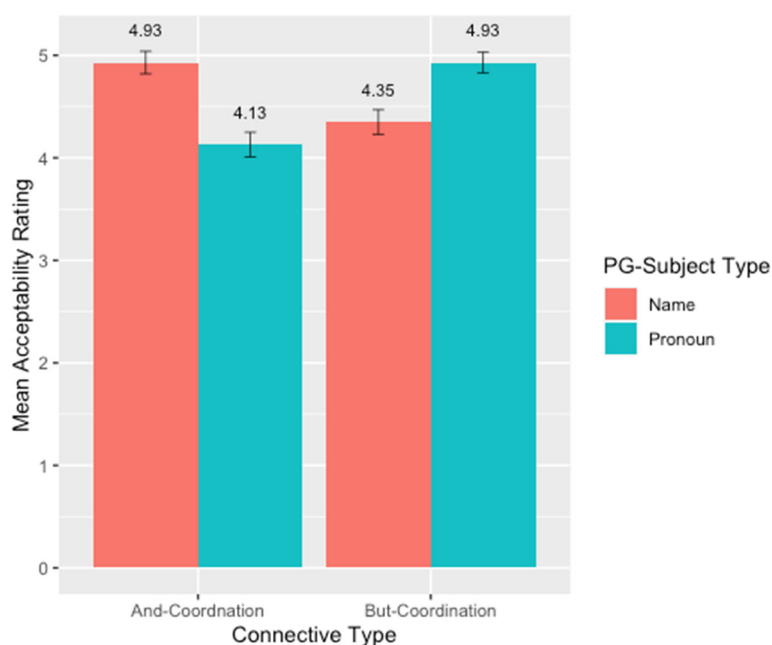


Figure 2. Mean Acceptability Ratings with Standard Error Bars for the Four Conditions in Experiment 2

As demonstrated here, in general, the mean acceptability ratings of *and*-coordination pseudogapping sentences showed the opposite pattern from those of *but*-coordination pseudogapping sentences. To be more specific, first, the mean acceptability rating of *and*-coordination pseudogapping sentences was higher with a proper name PG-subject than with a pronoun PG-subject (4.93 ($se = 0.11$) for the AndCoordName condition as in (10a) > 4.13 ($se = 0.12$) for the AndCoordPro condition as in (10b)), which replicated the results in Experiment 1. On the other hand, the mean acceptability rating of *but*-coordination pseudogapping sentences was higher with a pronoun PG-subject than with a proper name PG-subject (4.93 ($se = 0.10$) for the ButCoordPro condition as in (10d) > 4.35 ($se = 0.12$) for the ButCoordName condition as in (10c)). The results also showed that the mean acceptability rating of *and*-coordination pseudogapping sentences with a proper name PG-subject was higher than that of their *but*-coordination counterparts (4.93 ($se = 0.11$) for the AndCoordName condition as in (10a) > 4.35 ($se = 0.12$) for the ButCoordName condition as in (10c)) while the mean acceptability rating of *but*-coordination pseudogapping sentences with a pronoun PG-subject was higher than that of their *and*-coordination counterparts (4.93 ($se = 0.10$))

for the ButCoordPro condition as in (10d) > 4.13 ($se = 0.12$) for the AndCoordPro condition as in (10b)). Moreover, the mean acceptability rating of *and*-coordination pseudogapping sentences with a proper name PG-subject was the same as that of *but*-coordination pseudogapping sentences with a pronoun PG-subject (4.93 ($se = 0.11$) for the AndCoordName condition as in (10a) = 4.93 ($se = 0.10$) for the ButCoordPro condition as in (10d)), and the mean acceptability rating of *but*-coordination pseudogapping sentences with a proper name PG-subject and that of *and*-coordination pseudogapping sentences with a pronoun PG-subject were not that different although the former was slightly higher (4.35 ($se = 0.12$) for the ButCoordName condition as in (10c) > 4.13 ($se = 0.12$) for the AndCoordPro condition as in (10b)).

Just like Experiment 1, we performed a linear mixed-effects analysis of the participants' acceptability ratings, with CONNECTIVE TYPE and PG-SUBJECT TYPE as fixed effects and PARTICIPANT and ITEM as random effects. We obtained *p*-values, using the likelihood ratio tests of the full model with the effect in question against the reduced model without the effect in question, as in the norming experiment and Experiment 1 (Winter 2013).

From the analysis, we found no main effect of CONNECTIVE TYPE ($\chi^2(1) = 0.8331, p < 0.3614$; Estimate = 0.1120, $SE = 0.1237, t = 0.905$), indicating that overall *and*-coordination pseudogapping sentences were not rated significantly differently from *but*-coordination pseudogapping sentences regardless of whether they had a proper name or pronoun PG-subject. We also found no main effect of PG-SUBJECT TYPE ($\chi^2(1) = 0.8331, p < 0.3614$; Estimate = -0.1120, $SE = 0.1237, t = -0.905$), meaning that overall pseudogapping sentences with a pronoun PG-subject were not rated significantly differently from those with a proper name PG-subject irrespective of whether they involved an *and*- or *but*-coordination structure. However, we found a main effect of the interaction of the two factors ($\chi^2(1) = 38.969, p < 0.0001$).

To figure out the nature of the interaction effect, we then conducted post-hoc pairwise comparisons and the results are shown in Table 4:

Table 4. Post-hoc Pairwise Comparisons between Conditions in Experiment 2

Contrast	Estimate	SE	df	t.ratio	p.value
AndCoordName - ButCoordName	0.578	0.143	95.2	4.056	0.0006
AndCoordName - AndCoordPro	0.802	0.143	95.2	5.627	< 0.0001
AndCoordName - ButCoordPro	0.000	0.143	95.2	0.000	1.0000
ButCoordName - AndCoordPro	0.224	0.143	95.2	1.571	0.3999
ButCoordName - ButCoordPro	-0.578	0.143	95.2	-4.056	0.0006
AndCoordPro - ButCoordPro	-0.802	0.143	95.2	-5.627	< 0.0001

While the linear mixed-effect analysis showed no main effect of CONNECTIVE TYPE, the post-hoc analysis first revealed a significant mean acceptability rating difference between *and*- and *but*-coordination conditions for pseudogapping sentences with a pronoun PG-subject and for those with a proper name PG-subject, respectively. In other words, *and*-coordination pseudogapping sentences were rated higher than *but*-coordination pseudogapping sentences when they occurred with a proper name PG-subject but the opposite pattern was found when they occurred with a pronoun PG-subject. In addition, while the linear mixed-effects analysis showed no main effect of PG-SUBJECT TYPE, the post-hoc analysis also found a significant mean acceptability rating difference between pronoun and proper name PG-subject conditions for *and*- and *but*-coordination pseudogapping sentences, respectively. That is, *and*-coordination pseudogapping sentences were rated higher when the PG-subject was a proper name than when it was a pronoun, which replicated the results of Experiment 1; on the other hand, *but*-coordination pseudogapping sentences were rated higher when the PG-subject was a pronoun than when it was

proper name. Meanwhile, no significant mean acceptability rating difference was found between *and*-coordination pseudogapping sentences with a proper name PG subject and *but*-coordination pseudogapping sentences with a pronoun PG-subject and between *and*-coordination pseudogapping sentences with a pronoun PG subject and *but*-coordination pseudogapping sentences with a proper name PG-subject.

We then examined whether psych verbs improved the acceptability of *and*- and *but*-pseudogapping sentences in each condition employed in the experiment and the table below shows the mean acceptability ratings and standard errors for the conditions by verb type:

Table 5. Mean Acceptability Ratings and Standard Errors for the Conditions by Verb Type in Experiment 2

Condition	Verb	Mean	SE	Condition	Verb	Mean	SE
AndCoordName	Action	4.83	0.18	ButCoordName	Action	4.88	0.22
AndCoordName	Psych	5.02	0.19	ButCoordName	Psych	5.16	0.20
AndCoordName	State	4.95	0.20	ButCoordName	State	5.42	0.19
AndCoordPro	Action	4.11	0.22	ButCoordPro	Action	5.38	0.21
AndCoordPro	Psych	4.11	0.21	ButCoordPro	Psych	5.50	0.19
AndCoordPro	State	4.17	0.22	ButCoordPro	State	5.56	0.21

The results showed that *and*-coordination pseudogapping sentences with a psych verb were rated slightly higher than those with the other two verb types when they involved a proper name PG-subject while *and*-coordination pseudogapping sentences with a psych verb were rated the same as those with an action verb and lower than those with a state verb when they involved a pronoun PG-subject, which were somewhat different from the results about *and*-coordination pseudogapping sentences in Experiment 1. The results also showed that *but*-coordination pseudogapping sentences with a psych verb were rated slightly higher than those with an action verb but slightly lower than those with a state verb when they involved a proper name PG-subject whereas *but*-coordination pseudogapping sentences with a state verb were rated higher than those with the other two verb types when they involved a pronoun PG-subject.

In order to determine whether their mean acceptability rating differences were statistically different, we conducted post-hoc pairwise comparisons, whose results are shown below:

Table 6. Post-hoc Pairwise Comparisons between Verb Types in Each Condition in Experiment 2

Contrast	Estimate	SE	df	t.ratio	p.value
AndCoordNameAction - AndCoordNamePsych	-0.1875	0.248	105	-0.755	0.9742
AndCoordNameAction - AndCoordNameState	-0.1250	0.248	105	-0.504	0.9959
AndCoordNamePsych - AndCoordNameState	0.0625	0.248	105	0.252	0.9999
AndCoordProAction - AndCoordProPsych	0.0000	0.248	105	0.000	1.0000
AndCoordProAction - AndCoordProState	-0.0625	0.248	105	-0.252	0.9999
AndCoordProPsych - AndCoordProState	-0.0625	0.248	105	-0.252	0.9999
ButCoordNameAction - ButCoordNamePsych	-0.1250	0.248	105	-0.504	0.9959
ButCoordNameAction - ButCoordNameState	-0.2344	0.248	105	-0.944	0.9339
ButCoordNamePsych - ButCoordNameState	-0.1094	0.248	105	-0.441	0.9978
ButCoordProAction - ButCoordProPsych	-0.5625	0.248	105	-2.266	0.2174
ButCoordProAction - ButCoordProState	-0.4062	0.248	105	-1.637	0.5764
ButCoordProPsych - ButCoordProState	0.1562	0.248	105	0.629	0.9886

The analysis revealed that no pair reached a statistically significant difference in terms of their mean acceptability ratings, meaning that different verb types did not affect the acceptability of *and*- and *but*-coordination pseudogapping sentences used in Experiment 2, part of which replicated the findings of Experiment 1.

The findings of Experiment 2 showed that *and*- and *but*-coordination pseudogapping sentences were rated in the opposite manner, displaying the mirror image, when they contained a pronoun or proper name PG-subject. This first suggests that *and*- and *but*-coordination pseudogapping sentences cannot be grouped together and a finer distinction is needed, in support of the previous observations by Levin (1980), Agbayani and Zoerner (2004), and Kubota and Levine (2017). Given that the test *and*- and *but*-coordination pseudogapping sentences differed in terms of two types of contrast relations (i.e., one about polarity match/mismatch between the antecedent and PG-clauses and the other about proper name and pronoun PG-subjects), it also indicates that contrast plays an important role in the acceptability of pseudogapping sentences in certain respects. Moreover, the findings of this experiment showed that *and*- and *but*-coordination pseudogapping sentences were not rated statistically significantly higher with a psych verb in any of the conditions, further contradicting the claim in Levin (1980).

4. General Discussion

The first main finding of this study is the relatively high acceptability of comparative pseudogapping in comparison to pseudogapping in coordinate structure. This result confirms the findings from previous judgment surveys (Hoeksema 2006, Levin 1980, Miller 2014). The ratings for coordinate pseudogapping still tend to be in the range of moderate acceptability, i.e., around the median of a 7-point scale. It suggests that the comparative-preference is likely a pragmatic phenomenon and not one resulting from a hard, syntactic constraint. Together with previous corpus findings showing that comparative constructions dominate actual uses of pseudogapping data (Miller 2014), our results suggest that pseudogapping is a comparative-dependent, or driven, phenomenon. However, while Miller's (2014) corpus findings revealed a highly skewed proportion of comparative pseudogapping (96.7%) in comparison to noncomparative data, the rating difference between the two structures was not so drastic in our results. Speakers use pseudogapping at a much lower frequency with coordinate structure than with comparative, but they still tend to accept both structures.

The discrepancy between the tiny proportion of noncomparative pseudogapping in corpus data and its moderate acceptability found in this study adds to the body of data that suggest that usage frequency is not entirely a reliable predictor of acceptability ratings, especially for constructions that reside at the lower end of the frequency scale (Bermel and Knittl 2012, Featherston 2005, Kempen and Harbusch 2005). The strong tie between pseudogapping and comparative structure in corpus data might be understood to reflect how different types of ellipsis overlapping in their distributions divide up a common semantic or functional space. It is well-known that gapping is possible in both coordinate and comparative structures (Corver 1990, Hendriks 1995, Huang 1977) but that it is strongly attracted to the former, especially to the context of the conjunction *and* (Tao and Meyer 2006). A conjunctive gapping sentence such as *Madeline taught the juniors and Eva the seniors* communicates equality and symmetry in addition to the truth-conditional meaning, i.e., two individuals performed a similar activity and can therefore be considered equal in this respect. Pseudogapping can be seen to require some sort of symmetry, too, e.g., *Madeline taught the juniors better than Eva/she did the seniors* describes a complex situation that includes two similar events, i.e., teaching college students. But the symmetry in pseudogapping is a precondition for *comparison* through which differences in some quality or degree are established. To use Kehler's (2002) classification of coherence relations, gapping and pseudogapping seem to fit into discourse contexts leading to Parallel (used to draw attention to

similarities) and Contrast (used to draw attention to differences), respectively (Kehler 2002: 92, Kubota and Levine 2017).⁴ This subtle difference might be why speakers find pseudogapping in coordinate structure, a canonical context for Parallel, to be less natural than pseudogapping in comparative structure.

The present study also showed that, contrary to previous assumptions, effects of the pronominality of PG-subject varied according to connective/construction type. As for comparative pseudogapping, changes in the PG-subject yielded no significant difference in acceptability ratings (5.48 and 5.15 for pronoun and proper name PG-subjects, respectively). On the other hand, coordinate pseudogapping showed sensitivity to the lexical type of PG-subject. With the conjunction *and*, higher ratings were obtained when the PG-subject was a proper name than when it was a pronoun (3.6 and 4.16 in Experiment 1 and 4.13 and 4.93 in Experiment 2 for pronoun and proper name PG-subjects, respectively). However, with the adversative conjunction *but*, ratings were lower when the PG-subject was a proper name than when it was a pronoun (4.93 and 4.35 for pronoun and proper name PG-subjects, respectively). These results show that pronominality of PG-subject is not a main predictor of the acceptability ratings of pseudogapping sentences but that it crucially interacts with connective type to have a complex effect on them. It should be pointed out that these results disconfirm theorists' assumption that pronoun PG-subjects enhance the acceptability of pseudogapping irrespective of the syntactic structures it is realized in (Kubota and Levine 2017). The results are also interesting given the findings from previous corpus studies. In particular, Miller (2014) showed that the majority of PG-subjects he found from COCA were pronouns, in both comparative and noncomparative structures. While pronoun PG-subjects prevail in corpus data in terms of usage frequency, they are not particularly favored by speakers but rather are sensitive to the structure and meaning of the construction they occur in. We suspect that various factors may have been responsible for the complex effects of pronoun PG-subjects on speakers' judgment of pseudogapping sentences.

As is well-known, pronouns are a cohesive device that helps establish a tight connection between clauses and sentences. The use of "same subject" in successive clauses contributes to the continuity and accessibility of the topic. Such a phenomenon, called *topic continuity*, integrates multiple clauses into a cohesive discourse unit (Givón 1983). Given this, one can expect that the use of a pronoun as the PG-subject would aid the comprehension of pseudogapping sentences. We believe that this benefit in comprehension is one possible reason behind the dominance of pronominal PG-subjects in previous corpus data, and also the acceptability increases for those subjects in *but*-pseudogapping observed in the present study. But why did an opposite result obtain with *and*-pseudogapping? With *and* and a pronominal PG-subject, the PG-clause and its antecedent are too similar to effectively support the Contrast relation, e.g., *Madeline taught the juniors and she did the seniors* is most naturally understood as 'Madeline taught two groups of students, the juniors and seniors.' It can be reduced to a simple lexical or phrasal coordination, e.g., *Madeline taught the juniors and seniors*. However, in *but*-pseudogapping,

⁴ Parallel and Contrast belong to one of the three general classes of relations called *Resemblance*. According to Kehler, a Resemblance relation is established if commonalities and contrasts among entities and properties in two clauses are recognized. He further argues that this relation helps resolve ellipsis that requires syntactic reconstruction, i.e., ellipsis in which syntactic mismatches between the elided material and its antecedent are not permitted. While we agree with Kehler that ellipsis resolution may interact with the inference process behind coherence relations, we do not assume a strict division between syntactic/reconstruction-based ellipsis and purely semantic ones, given empirical evidence that mismatches in ellipsis are gradient rather than categorical. See examples of voice mismatches provided below: (i) is constructed and judged by Tanaka (2011: 476); (ii) is from Miller (2014: 83), originally from COCA.

- (i) ?My problem will be looked into by Tom, but he won't into yours.
- (ii) Ask Doll, who spoke as much about his schoolboy career ending as he did of the season in general.

there are at least two points of departure that draw comprehenders' attention, i.e., the polarity contrast between the auxiliaries and the contrast between the remnant and its correspondent, e.g., *Madeline taught the juniors but she didn't the seniors* (cf. **Madeline taught the juniors but seniors*). The way conjunctions interact with the subject or topics seem to require that contrastive topic subjects are needed for pseudogapping with *and* but not for pseudogapping with *but*. Adding contrastive topics to *but*-pseudogapping would require a three-way comparison, e.g., *Madeline taught the juniors but Eva didn't the seniors*. This may have caused extra difficulty to comprehending the *but*-pseudogapping sentences in our experiment.⁵

Finally, results from our experiments showed no effect of verb type on the acceptability of pseudogapping sentences. Levin (1980: 82) reported that some of her consultants found pseudogapping to be acceptable only with psychological or causative verbs, such as *annoy*, *bore*, *bother*, *disturb*, *get*, *remind*, etc. In addition, Levin also observed that comparative pseudogapping is less sensitive to the semantic class of the elided verb than noncomparative pseudogapping is. However, results of our experiments showed no evidence of these observations.

In sum, the present study explored factors that are known to influence the acceptability of pseudogapping sentences. These were connective type (comparative, *and*, and *but*), the lexical type of PG-subject (pronoun or proper name), and verb classes. Among these, connective type and the lexical type of PG-subject were known to control the frequency of the construction. The present study investigated whether and how the same three factors affect the acceptability of pseudogapping sentences. To summarize the results, comparative pseudogapping received significantly higher ratings than coordinate pseudogapping, which might be taken to suggest that the high frequency of comparative pseudogapping found from previous corpus studies directly relates to its acceptability. However, it should be noted that the ratings for coordinate pseudogapping were still in the acceptable range. Ratings on pronominal vs. proper name subjects in PG-clauses were more complicated than what previous studies suggested based on corpus findings and linguists' judgments. In particular, there was a striking difference between *and*- and *but*-pseudogapping: pronoun PG-subjects lowered the acceptability of the former but increased the acceptability of the latter. These results were discussed from the perspective of the varying discourse-pragmatic functions of different ellipsis types. Overall, the present study attempted to provide experimental data for further research on pseudogapping and to aid in expanding our understanding of the complex relationship between frequency and acceptability.

References

- An, A. and A. Abeillé 2021. Closest conjunct agreement with attributive adjectives. *Journal of French Language Studies* 1-28. DOI: 10.1017/S0959269521000193
- Agbayani, B. and E. Zoerner. 2004. Gapping, pseudogapping, and sideward movement. *Studia Linguistica* 58, 185-211. DOI: 10.1111/j.0039-3193.2004.00114.x
- Bates, D., M. Mächler, B. Bolker and S. Walker. 2015. Fitting linear mixed-effects models using lme4. *Journal of Statistical Software* 67(1), 1-48.
- Bermel, N. and L. Knittl. 2012. Corpus frequency and acceptability judgments: A study of morphosyntactic variants in Czech. *Corpus Linguistics and Linguistic Theory* 8(2), 241-275. DOI: 10.1515/cllt-2012-0010

⁵ A three-way contrast in gapping is known to render the construction bad or only marginally acceptable (Jayaseelan 1990, Sag 1976), e.g., **Alan gave Sandy a book, and Peter Betsy a magazine* (Sag's judgment).

- Boeckx, C. 2000. An additional note on pseudogapping. In K. Schwabe and N. Zhang, eds., *Ellipsis in Conjunction*, 117-132. Tübingen: Niemeyer.
- Bowers J. 1998. On pseudogapping. Ms., Cornell University.
- Bybee, J. 2007. *Frequency of Use and the Organization of Language*. New York, NY: Oxford University Press. DOI: 10.1093/acprof:oso/9780195301571.001.0001
- Corver, N. 1990. *The Syntax of Left Branch Extractions*. Doctoral dissertation, Tilburg University, Tilburg, The Netherlands.
- Davis, M. 2008-. The Corpus of Contemporary American English COCA. Available online at <http://corpus.byu.edu/coca/>
- Ellis, N. C. 2002. Frequency effects in language processing: A review with implications for theories of implicit and explicit language acquisition. *Studies in Second Language Acquisition* 24(2), 143-188. DOI: 10.1017/S0272263102002024
- Featherston, S. 2005. The decathlon model of empirical syntax. In S. Kepser and M. Reis, eds., *Linguistic Evidence: Empirical, Theoretical and Computational Perspectives*, 187-208. Berlin: Mouton de Gruyter.
- Gengel, K. 2013. *Pseudogapping and Ellipsis*. Oxford: Oxford University Press. DOI: 10.1093/acprof:oso/9780199665303.001.0001
- Givón, T. 1983. *Topic Continuity in Discourse: A Quantitative Cross-Language Study*. Typological Studies in Language 3. Amsterdam: John Benjamins.
- Hendriks, P. 1995. *Comparatives and Categorical Grammar*. Doctoral dissertation, University of Groningen, Groningen, The Netherlands.
- Hoeksema, J. 2006. Pseudogapping: Its syntactic analysis and cumulative effects on acceptability. *Research on Language and Computation* 4, 335-352.
- Huang, P. K. 1977. *Wh-Fronting and Related Processes*. Doctoral dissertation, University of Connecticut, Storrs, CT.
- Jayaseelan, K. 1990. Incomplete VP deletion and gapping. *Linguistic Analysis* 20(1-2), 64-81.
- Johnson, K. 2004. In search of the English middle field. Ms., University of Massachusetts Amherst.
- Kehler, A. 2002. *Coherence, Reference, and the Theory of Grammar*. Stanford, CA: CSLI Publications.
- Keller, F. 2000. *Gradience in Grammar: Experimental and Computational Aspects of Degrees of Grammaticality*. Doctoral dissertation, University of Edinburgh, Edinburgh, Scotland.
- Kempen, G. and K. Harbusch. 2005. The relationship between grammaticality ratings and corpus frequencies: A case study into word order variability in the midfield of German clauses. In S. Kepser and M. Reis, eds., *Linguistic Evidence: Empirical, Theoretical and Computational Perspectives*, 329-349. Berlin: Mouton de Gruyter.
- Kubota, Y. and R. Levin. 2017. Pseudogapping as pseudo-VP-ellipsis. *Linguistic Inquiry* 48(2), 213-257. DOI: 10.1162/LING_a_00242
- Kuno, S. 1981. The syntax of comparative clauses. In *Papers from the 17th Regional Meeting of the Chicago Linguistic Society*, 136-155. Chicago, IL.
- Lasnik, H. 1995. A note on pseudogapping. In R. Pensalfini and H. Ura, eds., *MIT Working Papers in Linguistics* 27, 143-163. Cambridge, MA: MITWPL.
- Lasnik, H. 1999. Pseudogapping puzzles. In S. Lappin and E. Benmamoun, eds., *Fragments: Studies in Ellipsis and Gapping*, 141-175. New York: Oxford University Press.
- Lau, J., A. Clark and S. Lappin. 2017. Grammaticality, acceptability, and probability: A probabilistic view of linguistic knowledge. *Cognitive Science* 5(41), 1-40. DOI: 10.1111/cogs.12414

- Lee, Jeong-Shik. 2018. Phonetic resurrection from ellipsis site: A case from pseudo-gapping. *The Linguistic Association of Korean Journal* 26(4), 55-81. DOI: 10.24303/lakdoi.2018.26.4.55
- Lenth, R., H. Singmann, J. Love, P. Buerkner and M. Herve. 2018. Emmeans: Estimated marginal means, aka least-squares means. *R Package* 1.5.2-1.
- Levin, N. S. 1980. *Main-Verb Ellipsis in Spoken English*. Doctoral dissertation, The Ohio State University, Columbus, OH.
- Merchant, J. 2008. An asymmetry in voice mismatches in VP-ellipsis and pseudogapping. *Linguistic Inquiry* 39(1), 169-179. DOI: 10.1162/ling.2008.39.1.169
- Miller, F. 1990. Pseudogapping and *do so* substitution. In *Papers from the 26th Regional Meeting of the Chicago Linguistic Society*, 293-305. Chicago, IL.
- Miller, F. 2014. A corpus study of pseudogapping and its theoretical consequences. In C. Piñón, ed., *Empirical Issues in Syntax and Semantics* 10, 73-90. Available at <http://www.cssp.cnrs.fr/eiss10/>
- R Development Core Team 2018. R: A language and environment for statistical computing [Computer software]. R Foundation for Statistical Computing, Vienna, Austria. Retrieved from <http://www.R-project.org/>
- Sag, I. A. 1976. *Deletion and Logical Form*. Doctoral dissertation, The Massachusetts Institute of Technology, Cambridge, MA.
- Tanaka, H. 2011. Voice mismatch and syntactic identity. *Linguistic Inquiry* 42(3), 470-490. DOI: 10.1162/LING_a_00054
- Takahashi, S. 2004. Pseudogapping and cyclic linearization. In K. Moulton and M. Wolf, eds., *NELS 34*, 571-585. Amherst: University of Massachusetts, Graduate Linguistic Student Association.
- Tao, H. and C. Meyer. 2006. Gapped coordinations in English: Form, usage, and implications for linguistic theory. *Corpus Linguistics and Linguistic Theory* 2(2), 129-163. DOI: 10.1515/CLLT.2006.008
- Thoms, G. 2016. Pseudogapping, parallelism, and the scope of focus. *Syntax* 19(3), 286-307. DOI: 10.1111/synt.12122
- Tomasello. 2003. *Constructing a Language: A Usage-Based Theory of Language Acquisition*. Cambridge, MA: Harvard University Press.
- Winter, B. 2013. Linear models and linear mixed effects models in R with linguistic applications. ArXiv:1308.5499.
- Zehr J. and F. Schwarz 2018. PennController for internet based experiments (IBEX). DOI: 10.17605/OSF.IO/MD832
- Zoerner E. and B. Agbayani. 2002. A pseudogapping asymmetry. *Snippets* 5, 18-19.

Examples in: English

Applicable Languages: English

Applicable Level: Tertiary