

VAVIRANCE IN ERROR CORRECTION AMONG LANGUAGE TEACHERS

日本語教師間での訂正パターンの揺れとその考察

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1. INTRODUCTION

This paper examines a wide range of variance in teachers' correction of students' grammatical errors and provides an analysis of that variance. Using a small data corpus that consists of 200 error sentences, we asked 10 Japanese language teachers (both from high school and higher education) to correct the error sentences in the same way they would usually correct their students' homework. The error corpus data involve errors that beginners (1st ~ 2nd year students) of Japanese prototypically would make, such as those in (1) - (2) below.

- (1) ドアがあけています。
 (2) れいぞうこには、どんな飲み物がおきますか。

Japanese language teachers are all familiar with errors such as those in (1) - (2). As such, one would assume that these errors should be corrected in the same fashion among language teachers. However, our data show that this is not the case, as shown in (3) - (4) below.

- (3) ドアがあけています。 (= (1))
 [Teacher A correction] ドアがあけてあります。
 [Teacher B correction] ドアがあいています。
 (4) れいぞうこには、どんな飲み物がおきますか。 (= (2))
 [Teacher A correction] れいぞうこには、どんな飲み物がおいてありますか。
 [Teacher B correction] れいぞうこには、どんな飲み物がありますか。

The finding that language teachers correct prototypical beginners' grammatical errors in different ways is rather surprising, and this paper explores reasons why such a variance exists. The paper also provides a high-level overview of a project called "AI (artificial intelligence) Teacher" because all the data provided in the paper were collected for this project.

The organization of the paper is as follows: Section 2 provides a brief introduction of the AI Teacher project. In Section 3, I explain the methodology of our data collection, which is called "teacher-sourcing." Section 4 discusses the linguistic rules that we have learned from the acquired data through the teacher-sourcing process. In Section 5, I will discuss what types of variance were found in our teachers' corrected data. I will first present some linguistic patterns that exhibit high variance in teachers' corrections and then provide my analyses on these patterns while providing some concrete examples from our data. Section 6 presents concluding remarks.

2. BACKGROUND: AI TEACHER PROJECT

We start with a high-level overview of the AI Teacher project. The goal of the AI Teacher project is to develop an AI-based language learning system that can help students to learn Japanese, with the special focus on writing. We designed the system in such a way that it can simulate the behavior of a Japanese language teacher in the following respects: First, the system can identify and correct mistakes that students made automatically when writing a Japanese sentence; second, it can provide instructive feedback for their mistakes in real-time. AI Teacher thus behaves like a human language teacher, which makes it unique and innovative.

One of the biggest challenges that we faced in developing the AI Teacher's system was the question of how to acquire the knowledge of teaching Japanese as a foreign language (hereafter, JFL); in order to make the system behave like a language teacher, the AI Teacher has to have the knowledge of JFL. How can we acquire JFL knowledge?

To tackle this question, we decided to crowd source JFL knowledge from Japanese language teachers; we call this process "teacher-sourcing." All the data presented in this paper were gathered through this teacher-sourcing process, and we expect the AI Teacher's system to acquire a substantial amount of JFL knowledge from these data.

3. METHOD OF DATA COLLECTION: TEACHER-SOURCING

The teacher-sourcing process involves two tasks: (i) to create error corpus data and (ii) to annotate (or correct) them. With the funding support from the Japan Foundation, Los Angeles, we conducted our initial teacher-sourcing during the fall of 2015. We recruited 10 Japanese language teachers in the US (4 from high school and 6 from higher education). We first asked them to create 200 error sentences that involve errors that beginners of their students would prototypically make. Through this task, we gathered a total of 2,000 error sentences from the participants. We randomized all these error sentences and distributed them to the participants. To make sure that 1 error sentence can be reviewed by 2 participants, each participant was assigned 400 error sentences for the annotation task (i.e., correcting these error sentences).

The annotation task was done individually online; we created 10 different URL's, each of which included 400 error sentences. We assigned these URL's to the participants (one URL per person), so that the participants could annotate the data online at their own pace.

We then compared the original error sentences and their corresponding corrected sentences, and learned linguistic rules based on the differences between the two data sets. Figure 1 describes how we conducted this experiment.

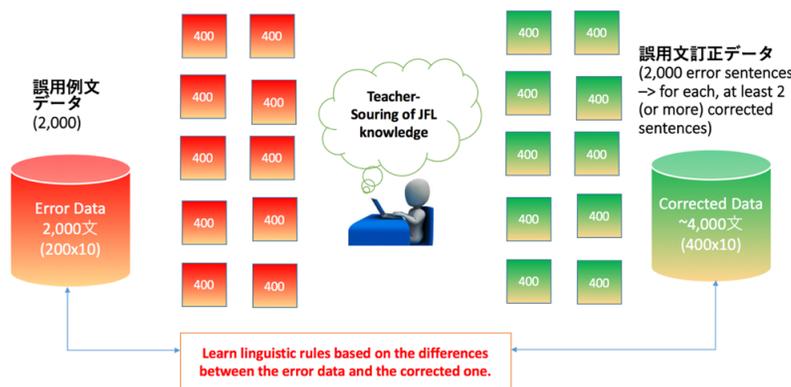


Figure 1: Teacher-Sourcing Method

4. ACQUISITION OF JFL KNOWLEDGE

We attempted to learn linguistic rules by comparing the error sentences and their corresponding corrected ones (see Figure 1 above). In so doing, we extracted two different types of rules: (i) (surface) string-based rules and (ii) generalized rules. String-based rules are simple transformational rules from one (bad) string to one (correct) one. For instance, the string rule of [会えない → 会わない] enables the system to correct sentences like (5) automatically.

(5) 今晚、友達に会あないつもりです。→今晚、友達に会わないつもりです。

We have acquired many such string-based rules, but they have a severe limitation; that is, they can apply only to the strings with exact matches. For instance, the string rule of [会あない → 会わない] cannot fix sentences like (6), even though both 会う (“to meet”) and 買う (“to buy”) belong to the same type of verb (i.e., U-verb/五段活用動詞).

(6) 買あないつもりです。

To accommodate this limitation of string-based rules, we attempted to extract more generalized rules based on the comparison between the error data set and the annotated one. To this end, we used natural language processing technology to tag certain lexical information about the words in the data (see <http://taku910.github.io/mecab/>). We have extracted many linguistic rules automatically, some of which are listed in Table 1 (Takahashi and Aikawa, 2016).

Rules	Error-Corrected Pair Samples
[形容詞-自立:基本形]でした→[形容詞-自立:連用タ接続]たです	おいしかったです→おいしかったです
[名詞-形容動詞語幹:*]なです→[名詞-形容動詞語幹:*]です	きれいなです→きれいです
[動詞-自立:基本形]じゃない→[動詞-自立:未然形]ない	戻るじゃない→戻らない
[動詞-自立:基本形]ください→[動詞-自立:連用形]てください	おきるください→おきてください

Table 1: Samples of Automatically Extracted Rules

Such generalized rules are more robust in that they can apply to other lexical items that belong to the same category. For instance, the first rule in Table 1 can apply to other adjectives (e.g., 高い でした→高かったです) and hence, it is more effective.

However, these automatically extracted generalized rules have some pitfalls. For instance, let us examine the data in (7) below.

(7) Rule: [動詞-自立:連用形]ます→[動詞-自立:連用形]ました

(7a) [error] 去年日本に行きますか。→[corrected] 去年日本に行きましたか。

(7b) [error] 昨日郵便局へ行きます。→[corrected] 昨日郵便局へ行きました。

Based on data such as those in (7a-b), we learned the rule in (7), but this rule would change all the sentences with the present tense (V-masu ending) to those with the past tense (V-mashita ending), which is not good at all. The rule should be triggered only when the sentence in question contains some lexical item(s) that signal the past tense (e.g., 去年 (“last year”) and 昨日 (“yesterday”) in (7a) - (7b), respectively). The problem is that our system currently cannot check any semantic information of the lexical items in a given sentence, and admittedly, we still need to inspect these automatically extracted rules manually. Having said that, we are confident that the AI Teacher’s system has gained a decent amount of JFL knowledge through this initial teacher-sourcing experiment.

5. VARIANCE

In verifying the data from the teacher-sourcing experiment, we have discovered a wide range of variance in teachers’ corrections. This section provides some concrete data to show what types of variance were found in teachers’ corrections. In so doing, first I investigated

what types of linguistic patterns are involved in the sentences that exhibit a high variance in teachers' corrections. Table 2 below lists some of these patterns. In the following sub-sections, I discuss each of these patterns while providing actual data.

Linguistics patterns/characteristics
Existential Verbs “ある/いる”
WH-words
Transitive/Intransitive Verb+ある/いる
Interpretations of TE-form (Verb-TE or Adjective-TE)
Tense/Aspect

Table 2: Linguistics patterns of the sentences with a high variance in teachers' corrections

5.1. EXISTENTIAL VERBS

Japanese has two types of existential verbs: (i) あります (“to exist”) and (ii) います (“to exist”). The choice between the two depends on whether its subject is animate or not; if it is animate, います is used, and if not, あります is used. Although the grammatical distinction is clear, beginners of Japanese often make mistakes, such as the one in (8) below.

[Error] (8) 私は、五人家族が <u>あります</u> 。	“I have a family of 5 (people).”
(8a) (?) 私は、五人家族が <u>います</u> 。	“I have a family of 5 (people).”
(8b) 私は、五人家族です。	(lit.) “I am a family of 5 (people).”
(8c) 私の家族は、五人です。	(lit.) “My family is 5 (people).”

Table 3: Error-Corrected Pair Sample Data Involving Existential Verbs

The subject of the predicate (i.e., 家族 “family”) is animate and hence, います, not あります, should be used. Thus, (8a) seems to be the most straightforward way to correct the error in (8). However, we see data like those in (8b) and (8c): (8b) uses the copula です (“to be”) and the sentence literally means, “I am a family of 5 (people)”, and (8c) means “My family is 5 (people)”. The question is, why did such alternative corrections arise?

I argue that the answer lies in the nature of the noun 家族: 家族 is a so-called “collective noun” and it may conflict with the co-occurrence of the numeral quantifier 五人 (“five people”) in (8b), and some native speakers of Japanese find (8a) unacceptable (Abe, 2016). By contrast, (8b) and (8c), where the copula です is used, are perfectly grammatical. I believe that in order to avoid the conflict mentioned above, some teachers came up with (8b) and/or (8c).

It is important to note that when the subject in question is not a collective noun such as in (9), the usage of the copula です becomes unavailable, as shown by the ungrammaticality of (9b) or (9c), and the only way to fix (9) is by replacing あります with います, as shown in (9a).

[Error] (9) 私は、5匹ねこ <u>があります</u> 。	“I have 5 cats.”
(9a) 私は、5匹ねこが <u>います</u> 。	“I have 5 cats.”
(9b) *私は、5匹ねこです。	(lit.) “I am five cats.”
(9c) ?*私のねこは、5匹です。	(lit.) “My cats are 5.”

Table 4: Case with a Non-Collective Noun Subject

5.2. WH-WORDS

Errors such as the one in (10) below are also common mistakes that beginners of Japanese would make: in (10), the usage of the WH-word どの (“which”) is wrong because どの is a demonstrative and it needs to be followed by a noun.

[Error] (10) 田中さんは、 <u>どの</u> ですか。	“Which person is Mr. Tanaka?”
(10a) 田中さんは、 <u>どの人</u> ですか。	“Which person is Mr. Tanaka?”
(10b) 田中さんは、 <u>どんな人</u> ですか。	“What kind of person is Mr. Tanaka?”
(10c) 田中さんは、 <u>だれ</u> ですか。	“Who is Mr. Tanaka?”

Table 5: Error-Corrected Pair Sample Data Involving WH-Words

(10) can be corrected by replacing どの (“which”) with どの人 (“which person”), as in (10a). We also see corrections such as those in (10b) and (10c). Although both (10b) and (10c) are grammatical, I argue that they deviate from the original sentence of (10) in terms of intention: the intention of (10) is to ask, “Which person is Mr. Tanaka?” By contrast, (10b) means, “What type of person is Mr. Tanaka?” and (10c), “Who is Mr. Tanaka?” and, their meanings are different from that of (10). Thus, I consider corrections such as those in (10b) or (10c) instances of “overcorrection.” I contend that in correcting student’s error sentences, it is imperative to pay close attention to the intention of their original sentence(s).

5.3. TRANSITIVE VS. INTRANSITIVE VERBS

Japanese has a list of transitive vs. intransitive verb pairs that are morphologically similar to each other, and learning how to use them is one of the most challenging things for many learners of Japanese. All language teachers must be familiar with errors, such as the one in (11), in which the transitive verb あける (“to open”) is wrongly used.

[Error] (11) ドアが <u>あけて</u> います。	“The door is open.”
(11a) ドアが <u>あいて</u> います	“The door is open.”
(11b) ドアを <u>あけて</u> います。	“(I/someone) is opening the door.”
(11c) ドアが <u>あけて</u> あります。	“The door has been opened.”

Table 6: Error-Corrected Sample Data Involving Transitive vs. Intransitive Verb Pairs

(11) is most likely to express the present state of the door being open, and the replacement of the transitive verb あける (“to open”) with its intransitive counterpart あく (“to open”) can correct (11) without deviating from its original intention, as shown in (11a).

Interestingly, we see a couple of alternative corrections, which are listed in (11b) and (11c): (11b) involves the replacement of the nominative case marker が with the accusative marker を, and (11c) involves the replacement of います (“to exist”) with あります (“to exist”). I argue that although both (11b) and (11c) are perfectly grammatical, they are instances of overcorrection because they deviate in meaning from the original sentence: (11b) means “(I am or someone is) opening the door”, which is different from the intention of expressing the present state, “the door is open”. (11c), on the other hand, can refer to the state of the door being open, but it has the extra implication that someone has opened the door beforehand (for some purpose(s)), and as a result, the door is open.

5.4. INTERPRETATIONS OF TE-FORM (V-TE AND ADJECTIVE-TE)

The Japanese so-called TE form carries various types of meanings, and its interpretation is dependent on the given context. Table 7 lists some prototypical usages of the TE-form for the beginner’s level.

Interpretations	Example
Giving Reason(s)	おそくなって、すみません。 (“Sorry for being late.”)
Sequence of Action(s)	朝起きて、新聞を読んで、学校に来ました。 (“(I) got up in the morning, read the newspaper, and came to school.”)
Manner	今日は、歩いて来ました。 (“(I) came here on foot today.”)

Table 7: Various Types of Interpretations Associated with TE-Form

Because of the nature of the TE-form mentioned above, sentences that involve a TE-form (whether it is a Verb-TE or an Adjective-TE) are expected to have a high variance in teachers’ corrections. This prediction indeed was borne out to be true. For instance, let us look at (12), where the TE-form of the adjective かわいい (“cute”) is wrongly conjugated and its intention is “giving a reason” (for why I like cats).

[Error] (12) ねこはかわいいで好きです。	“Cats being cute, I like them.”
(12a) ねこはかわいくて、好きです。	“Cats being cute, I like them.”
(12b) ねこはかわいいので/から、好きです。	“I like cats because they are cute.”
(12c) ねこはかわいいし、好きです。	“I like cats because they are cute; etc.”

Table 8: Error-Corrected Pair Sample Data Involving TE-Form (1)

The simplest correction would be to change かわいいで to かわいくて, as in (12a). We also see the type of correction provided in (12b): the use of the subordinate conjunction, such as ので (“because”) or から (“because”), in place of the TE-form here is perfectly grammatical and it does not deviate from the original intention of (12).

We also see the use of the subordinate conjunction -し (“...and”), which is provided in (12c). However, (12c) has a slightly different connotation from (12); that is, (12c) can imply that besides cats being cute, there may be other reasons why I like them. In this respect, (12c) might be considered to be an instance of overcorrection.

[Error] (13) お金が <u>ない</u> で困っています。	(lit.) “Having no money, I am in trouble.”
(13a) お金が <u>なくて</u> 困っています。	(lit.) “Having no money, I am in trouble.”
(13b) お金が <u>ないので/から</u> 、困っています。	“Since I don’t have money, I am in trouble.”
(13c) お金が <u>ないし</u> 、困っています。	“I don’t have money, and I am in trouble.”
(13d) お金が <u>ないと</u> 、困ります。	“If (I/we) don’t have money, (I/we) are in trouble.”

Table 9: Error-Corrected Pair Sample Data Involving TE-Form (2)

The examples in Table 9 exhibit a similar pattern to those in Table 8; the error sentence in (13) involves the wrong TE-form of the negative predicate ない (“not”), and it can be fixed by using the correct TE-form of ない (i.e., なくて), as in (13a). The use of ので/から (“because”) in (13b) is also fine because the TE-form functions to express the reason why the speaker is in trouble. Just like the case in (12c), the use of し (“...and”) in (13c) is fine, but it can be considered to be an instance of overcorrection because (13c) implies that besides “not having money”, there may be other reason(s) why I am in trouble. Also, we see the use of the conditional と (“if”), as in (13d). However, I consider (13d) to be an instance of overcorrection because it deviates from the original intention of (13).

Here, I would like to note that the use of と in (13d) is interesting because it can be used for the context of (13) but not for that of (12). Examine the contrast in grammaticality between (14a) and (14b).

- (14) a. ????ねこはかわいいと、好きです。
 b. お金がないと、困ります。(=13d)

The contrast above can be ascribed to the nature of the conditional と; that is, the conditional と implies an “automatic cause-and-result” relationship between the subordinate clause and the main clause: it makes sense to say, “if we don’t have money, we will be in trouble (automatically)” but, it does not make much sense to say, “if a cat is cute, we will like it (automatically).” The lack of the direct/automatic cause-and-result relationship between the two clauses in (14a) thus makes the sentence awkward.

5.5. TENSE/ASPECT

Japanese is claimed to be an aspectual language, and the distinction between the so-called present vs. past forms of a predicate (e.g., masu-form vs. mashita-form; desu-form vs. deshita-form) is different in nature from the one between English present vs. past tenses. Further, unlike English, Japanese does not have a tense agreement between the main clause and subordinate clause(s). For instance, compare (15a-b) with (16a-b).

- (15) a. I thought that the class was interesting.
 b. *I thought that the class is interesting.
- (16) a. ???/?*そのクラスは、面白かったと思いました。
 b. そのクラスは、面白いと思いました。

The English examples in (15a-b) are parallel in structure to the Japanese ones in (16a-b): (15a), in which the tense agreement between the main clause and the subordinate clause is observed,

results in grammaticality, whereas (15b), in which the tense agreement between the two clauses is not observed, results in ungrammaticality. By contrast, (16a), in which the tense agreement is observed, is ungrammatical, whereas (16b), in which the tense agreement is not observed, is grammatical. The contrasts in grammaticality between (15a-b) vs. (16a-b) show that the present vs. past form distinction in Japanese is different in nature from that in English, and this difference presents a big challenge for many students.

Now let us examine our data in Table 10. The error sentence in (17) can be penalized on three accounts: first, the co-occurrence of the adjective (面白い) and the past copula form でした is wrong. Second, the polite form of a predicate should not be used before と (“that”) here. Third, as just mentioned above, Japanese does not have a tense agreement between the main clause and the subordinate clause, and the (intended) use of the past tense in the subordinate clause makes the sentence awkward.

Now, in our data, we see three different types of corrections, which are presented in (17a) - (17c) below.

[Error] (17) 映画は面白いでしたと <u>思</u> いました。	(lit.) “I thought that the film was interesting.”
(17a) 映画は面白いと <u>思</u> いました。	(lit.) “I thought that the film is interesting.”
(17b) ???/?*映画は面白 <u>か</u> ったと <u>思</u> いました。	(lit.) “I thought that the film was interesting.”
(17c) 映画は面白 <u>か</u> ったと <u>思</u> います。	(lit.) “I think that the film was interesting.”

Table 10: Error-Corrected Pair Sample Data Involving Tense/Aspect

I argue that (17a) is the most straightforward way to correct (17). (17b), in which the subordinate clause is marked as the past tense, is unacceptable on a par with (16a) above. (17c) is grammatical, but it deviates from (17) in meaning: (17) means that the utterance point of time when the writer thought that the film was interesting is in the past. (17c), on the other hand, indicates the utterance point of time when the writer had the thought is in the present. In this respect, (17c) is different in meaning from (17).

6. CONCLUDING REMARKS

Correcting students’ errors is one of the basic tasks that we language teachers do on a daily basis, and one would assume that we would do it in the same or (at least) a similar fashion. Yet, this is not always the case, as we saw in this paper.

I argued that when correcting students’ errors, it is imperative for us to pay close attention to the intention of the original error sentence. Without doing so, we would end up overcorrecting our students’ errors. Also, we need to investigate the source of their errors. For instance, we have seen the case (i.e., 17b) where students’ errors are due to the language transfer (i.e., superimposing English grammar onto Japanese). It would be helpful for us to think about the cause of such errors, so that we can provide instructive feedback for our students.

Here, I want to emphasize the importance of providing our students with meaningful feedback when correcting their errors. Certain types of errors are extremely difficult to explain. Yet, without our feedback, our students would keep making the same mistake(s) over and over again and eventually, their mistakes would get fossilized. We should do our best to avoid such error fossilization.

The paper unveiled a wide range of variance in teachers' correction of students' errors. The data presented here are only the tip of the iceberg of the whole data that we gathered through our initial teacher-sourcing process, and further discussion of this range of variance is beyond the scope of this paper. However, I hope that the paper has shed new light on how to correct our students' errors.

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