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## **THE VARIETY OF PROBLEMS IN JAPANESE STUDENTS' HYPOTHETICAL PREMISE CONSTRUCTIONS**

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### **Abstract**

*Among the foundations of critical thinking in EFL is the ability of language learners to be able to express their views in terms of predictions and outcomes. It is all the more important in science universities such as the institution where the author teaches. Nine Japanese first-year university students in Japan, participated in a study involving an extended experiential learning project, using physical objects and observable phenomena. While students' general use of premise and conclusion markers markedly improved, problems in their construction of hypothetical premises persisted. I will discuss the types of problems and offer explanations for why these problems continue to occur, and I will suggest ways in which instruction on hypothetical premise construction may be improved.*

### **Keywords**

Language, Critical Thinking, Conditional Statement, Discourse Marker, Argument, Coherence, EFL

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## **1. Introduction**

In this paper, I discuss the use of discourse markers related to written argument in academic and professional settings. I start with discourse markers used to direct logical movement. I then focus specifically on premise and conclusion indicators, and from there, argument indicators related specifically to conditional statements. Within that category, I narrow the topic further, to focus on future-predictive conditional statements, i.e., hypothetical premises.

Following this, I identify the need for research, noting studies showing that the use of argument-related discourse markers is associated with more successful essay and report writing; and that, furthermore, linguistic knowledge and skills required for the use of such discourse markers are specifically a problem for Japanese students. After this, I discuss the function and the prescribed form of hypothetical premises. I distinguish between several types of flaws in students' construction of hypothetical premises. I note some likely reasons for these flawed constructions. Lastly, I point to ways in which improved instructional techniques may lead to more favorable future outcomes.

## **2. Literature Review**

During the mid-2000s, it became clear to Japanese educators and policymakers that the skills germane to argumentative writing would become increasingly important. MEXT's 2011 *Five Proposals* made an appeal for the teaching of communicative skills necessary for reasoned self-expression (MEXT, n.d.).

Although Japanese students' writing is typically grammatical, signposting of argumentative elements is often insufficient. The literature in this field bears out the need for a closer inspection of the pedagogy of written English argument instruction. The writing of first-year non-native university students often lacks coherence owing to low use of metadiscourse markers (Eggins, 2014). In other cases, non-native speakers of English employ metadiscourse markers more frequently than warranted (Williams, 1992). In the former case, writing was deemed to be of low comprehensibility. In the latter case, overuse of markers was distracting (Basturkmen and Randow, 2014). In either case, the result is writing in which metadiscourse markers are used in contradiction with the usage found within the discourse community that students, as novice writers, aspire to join.

Metadiscourse, used with well-measured frequency and appropriacy leads

knowledgeable readers to comprehension of a text's structure (Basturkmen and Randow, 2014). In argumentative writing, two of the most common of these are *because* and *so*. When employed in propositional statements, metadiscourse markers can indicate causality between items, actions, or events. In argumentation, propositional statements are often called premises (Moore and Parker, 2012).

Taxonomically, hypothetical premises are *future predictive* conditional statements (Ishikawa and Suzuki, 2016). They argue for a causal and temporal relationship between a condition described in the first clause of a sentence and the second clause of that same sentence. Those two clauses are called the antecedent and the consequent (Moore and Parker, 2012). The order of these clauses can be reversed and the metadiscourse marker can be selected according to the direction of logic or causality. Within arguments, conditional statements constitute a premise, taking the form of an embedded sub-argument where the subsequent propositional statement, i.e., premise, hinges on the prior conditional statement's consequent.

Difficulty for Japanese students in constructing conditional statements was studied as early as the mid-1980s (Bryant, 1984). In the last ten years, Ishikawa and Suzuki (2016) detected a tendency among Japanese students to use present counterfactual statements where future predictive statements would have been more appropriate.

Appropriacy in metadiscourse marker use is another metric used to judge writing quality. Appropriate use of metadiscourse markers to direct logical flow was associated with higher scores (Intaraprawat and Steffensen, 1995; Cheng and Steffensen, 1996; Sanford, 2012). During my analysis of participants' attempts at writing hypothetical premises, some stylistic contradictions on the part of the students who attempted these constructions were evident. Closer inspection led to categorization based on types of differences. Participants had been taught, during group work, to distinguish hypothetical premises from conditional statements, based on the following prescriptive rule: hypothetical premises are single-sentence, two-clause *If x, then y* structures where the *If* clause is present tense and the *then* clause is future tense. Future tense may be constructed via a *will+verb* or *until* discourse marker. For example, *Whenever I ride my bicycle on road-x, I get a flat tire* is a conditional statement. *If I ride my bicycle on road-x, I will get a flat tire nine out of ten times* is a hypothetical premise. Using that construction as a tool for measuring predictive power and the reliability of the claim being made, a bicycle could be test-ridden on road-x several times sufficient to produce statistically robust data, and the number of times a flat tire occurred

could be noted. In this way, a simple formulaic linguistic construction becomes a tool that can be used to determine how reliable the predictive statement is.

### **3. Writing Assignment Topic: The Three-Door Problem**

In presenting these examples, it is necessary to briefly explain the topic, to the extent that it clarifies the common theme which runs throughout the examples of student writing presented in later sections.

This topic involves a question in probability called *The Three-Door Problem*. Three overturned cups are presented to a *player*, who is told that one of the cups contains an object possessing some intrinsic value. The player is asked to choose one cup. If the player chooses Cup 1, then the *gamemaster* removes one of the two other cups, specifically an empty one. The player is then asked whether he or she would like to alter his or her choice to the other remaining cup. Counter-intuitively, that player should always take advantage of the opportunity. Doing so will raise the probability of ending on the cup containing the valued object to 66.7% (Aaron and Spivey, 1999).

### **4. Methodology**

Being able to employ these skills in order to satisfy the expectations and standards of a given discourse community enables one to enter and engage as an equal. To this end, I tasked students to use hypothetical premises in a class project.

The students in this study had no previous knowledge about the topic. Because the outcome of repeated trials aimed at producing robust data could be expected to run against the grain of common sense, the topic was considered to be appropriate for generating interest and motivated engagement with the writing assignment.

Students were tasked to write short text passages predicting the outcome of thirty trials of an experiment in which the choice of cups was *not* changed and to employ hypothetical premises for that purpose. This experiment was then carried out and data was collected. Analysis of the data was performed by students to assess the reliability of their hypothetical premises. Following this, students received explicit instruction on writing hypothetical premises. They were tasked to notice the difference, comparing exemplars with their writing. The process was then repeated with the cup selection switch implemented. The first and second sets of hypothetical premises were compared by the instructor to determine what changes or improvements had been achieved.

Applying open, axial, and selective coding (Strauss & Corbin, 1990), several themes emerged, so that it became possible to categorize students' written output in terms of the kinds of divergence from the *If x (present tense), then y (future tense)* model which I had instructed students to use. The first category was created to account for written submissions from students who did not in any way respond to the assignment. The second category was created to account for constructions where the first clause was written, correctly, in the present tense, but the remainder of the sentence was written in the present tense. Third, I categorized constructions that only implied a future tense rather than generating one explicitly. This was done by using words that implied potential for something to happen at a time in the future. Fourth, I categorized constructions that were closer to future tense than those found in the preceding categories, but which were nevertheless detracted from by the use of modal verbs such as *would* to form a flawed future tense construction. The last category described attempts that were nearly perfect, but which demonstrated an incomplete understanding of the function of hypotheses that resulted in atypical vocabulary usage.

These were the criteria by which I categorized students' written output. In the following section, I will present some examples of students' writing which represent the types of problems that I noted.

## 5. Results: Student Written Output

Before carrying out the second set of experiments in class and collecting quantitative data from the outcomes, students were tasked to write an argument about what they believed would be the outcome of a 30-trial experiment involving this issue. The arguments were required to include one hypothetical premise. Below is an example of what would have received an evaluation of *exemplary*:

*If players change their first choice every time, then they will win about twenty of the thirty times.*

This example has three important qualities. First, it follows the *If x (present tense), then y [future tense]* prescription, which was taught during the instruction. Second, it refers to the outcome of the experiment, and not self-referentially to details of the procedure itself. Third, it merely predicts the number of times out of the aforementioned 30-trial experiment the player will end on the correct cup. This is in contrast to many cases that jump a step and announce the probability value, which, in the assigned report, is usually discussed in a later section.

Below are some representative examples of constructions that deviated from the form that students had been instructed to use.

There were several cases of the first category, where submitted work did not respond to the task, but I omit these here as they are outside the scope of this paper. As for the second category, the following are two excerpts that illustrate the points made earlier.

- *I think the probability is one third.*
- *It is one third, because I choose one cup out of three.*

In both cases, this is a single clause construction, the second case having an explanation affixed. Also, both skip the step and jump to the conclusion regarding the probability rather than predicting the outcome of this particular experiment, with its specific number of trials. Both cases fall short, being composed in the present tense by way of the verb, *is*.

Another similar frequently appearing construction that involved the use of the word *becomes* was:

*. . . the probability becomes 2/3.*

This is discussed below from the perspective of L1 interference, but here it can be noted that a suggestion of a future tense is expressed through the present tense.

The Category 3 example that follows is typical of what I have termed *conditional potentiality*. While the second clause remains in the present tense, a future time in which there is potential for actions to be carried out or for events to happen is implied. In the first case:

*If I change to Cup3, I can double the probability of getting the correct cup,* potentiality is created by the use of the word *can*. Alternately, *could* was sometimes used to the same effect:

*If you do this trail [sic] 30 times, you could choose the correct cup about 20 times.*

In both cases, not only is the tasked future tense not used; but the structure is also compromised by the inclusion of the words *can* or *could*, which detracts from the force of the predictive statement.

In this fourth category, a few students, in addition to not addressing the outcome of the 30-trial experiment, and instead focusing on the issue as an abstract question, also used the modal verb *would*, rather than *will*.

In the case, below:

*If we infinitely repeated the trial, the number we choose the correct cup divided by the number of the trial would approach 2/3.*

The fifth category accounts for attempts that indicate the student did not fully understand the function of hypotheses as a tool that tests predictions, rather than a description of what they believed. Two such examples were:

- *If the dealer let a player do an experiment 30 times, the probability will go to 2/3.*
- *If you repeat this trial, this probability will settle two thirds.*

What is missing is a mention of the evidence that would support arriving at those probability values.

From these categorized examples we can understand that, for EFL students, learning to compose hypothetical premises, is indeed more difficult than one might expect. In the next section, I briefly discuss possible reasons for this difficulty.

## 6. Discussion: Reasons for the Use of Present Tense for Future Events

In the previous section, I presented several categories of students' errant constructions. The reasons for these are likely to be three-fold:

- L1 interference
- Social norms
- A misunderstanding of the function of the hypothesis

Regarding the first reason, in Japanese, the same form that is used for general behavior or casually what one is doing now is also used for future actions. For example, *I study* is *benkyo-shimasu*, the *shimasu* being the present tense to-be verb suffix. However, *I study every day* / *Mainichi benkyo-shimasu* and *I will study tomorrow* / *Ashita benkyo-shimasu* both use the *shimasu* ending. The expression that was most commonly used by students constructing hypotheses was *the probability becomes*, with the same *-masu* ending used for *narimasu*, *to become*.

The second reason for the lack of use of the future tense is that first-year Japanese university students are often reticent about making strong claims. Reticence, in general, is part of Japanese society (Bao, 2014). It may be that certain L2 constructions are seen as possessing a strong propositional stance. Using the expression *will do* in a predictive sense may carry a notion of commitment which may make some Japanese uncomfortable. Japanese students who wish to communicate effectively in English must be familiar enough with the general stylistic practices expected by their target audience (Maynard, 1998), i.e., what Hyland (2017) refers to as a *recipient filter*, to be able to write competently in that genre.

As for the third issue, the use of the term *probability* in their hypotheses seems to have played a role in leading students to maintain the present tense. Correctly, they want to say what the probability is, rather than what it will be. However, these students had a belief about the probability value and skipped over informing the reader what outcome of the experiment would substantiate arriving at that value. Doing so neglects factors such as the low number of trials, in this case 30, where 3000 trials might produce more reliable data. For this reason, the language involved in the discussion of probability is not commonly used in hypotheses, but is used in later sections discussing data analysis.

## 7. Conclusion

How much these factors apply to Japanese language learners and at what ages they factor in the most and least is a subject that will require a larger study, perhaps coordinated between multiple universities. At this time, it can be said that instructors may improve their teaching of conditional statements and hypothetical premises, first by becoming aware of these factors and adjusting their teaching styles according to their specific contexts and best judgment. Taking the culture into consideration is also important. Language teachers may also find it useful to ask how hypothesis formation and the construction of hypothetical premises are taught to students in other classes in their native language. Lastly, it is important to frame these differing constructions, not as mistakes, but as steps along students' interlanguage journey (Hosseini and Sangani, 2015).

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