

# The Feature Reconstruction Hypothesis

## --Examining SLA studies on the English Preposition ‘with’--

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### 1. Introduction

Prepositions have traditionally been categorized as ‘lexical’ (content words) along with Verbs, Nouns, and Adjectives. However, they have recently been reexamined and studied in various fields such as not only theoretical linguistic studies but also empirical studies such as child language acquisition studies or brain-localization studies, or brain damage or impairment studies: for example, Broca’s agrammatic aphasia which entails a syntactic deficit both in sentence production and sentence comprehension.<sup>1</sup> Agrammatic aphasia particularly affects the person’s ability to use function words, categorized as ‘functional’<sup>2</sup> or even to organize words in their correct order.

According to Froud (2001), since prepositions supposedly fall into the category of functional words, their use should be affected by agrammatic aphasia. However, this prediction has not been supported by her study. Instead, Froud (2001) describes four characteristics of functional categories, and shows that prepositions are neither in conformity with all four of these characteristics (criteria), nor in line with those of content words (lexical categories). Froud (2001), then, concludes that the distinction between function and content words should be reassessed. Grodzinsky (1988) came to a similar conclusion in his research on agrammatic aphasia. This line of debate is necessarily important, since it highlights that prepositions are a tricky subject and illuminates the apparent elusiveness of their categorical status between lexical and functional. To put it another way, it emphasizes the clear bi-categorical status of prepositions, rendering or having both syntactic properties and semantic properties, the so-called ‘lemmatic properties (cf. Bong 2011).

The preposition ‘*of*’, for example, has been studied in the fields of language acquisition or brain-language relations with respect to their syntactic properties (namely their categorical status) along with the preposition ‘*for*’ as either a head of a clause (CP, Complimentizer Phrases) (i.e. as a Complimentizer, [CP [Specifier C-head]]) or a head of a prepositional phrases (PP). On the other hand, other prepositions including the preposition ‘*with*’ in question are not thoroughly investigated with respect to their categorical status (as of their syntactic

properties), although it is known that ‘*with*’ renders bi-categorical properties, especially in ‘attendant circumstance’ as in ‘*with V-ing*’ vs. ‘*with a NP*’. Nonetheless, its lexical characteristics (in other words, semantic properties) have been explored relatively well in the literature while its differential difficulties in L2 acquisition have recently been paid some attention owing to Bong’s series of studies on L2 acquisition of English prepositions (Bong 2011, 2012, 2013).

There are several studies on the semantics of the preposition ‘*with*’ (e.g. Moryyama et. al. 2010), but not many empirical L2 studies. Recently, Bong (2011, 2012, 2013) has brought forward the issues on the topic of the L2 acquisition of the preposition ‘*with*’ also with other prepositions, and its syntactic and semantic properties as well as the linguistic differences between L1 which has post-positions (that is, head-final languages such as Korean and Japanese in) and L2 English which has pre-positions (that is, head-first languages such as English). Bong (ibid) has drawn attention to their syntactic properties, such as bi-categorical status between C (C head of CP-Complement Phrase) and P (P head of PP-Prepositional Phrase), and their feature/lexico-syntactic operations in/between Lexicon and Computation, so called ‘Selection’ and ‘Construction’<sup>3</sup> of semantic and syntactic features in the lexicon to be inserted into Computations such as ‘Merge’, ‘Move’, ‘Agree’, and so on before ‘Spell Out’. Bong (ibid) has attempted to answer such questions as ‘Which prepositions would be easier to acquire than other?’, or ‘Which senses of a preposition would be easier or more difficult than other?’, or ‘What roles do the ambiguous categorical status of the prepositions or specific ‘lemmatic properties’ play in L2 Acquisition?’

Attempting to contribute to the discussion of the two competing L2 acquisition theories, namely the Cognitive Model of Language Acquisition with the Prototypicality Hypothesis (e.g. Yamaoka (1995, 1996) and Hayashi (2001) vs. the Minimalist Model of Language Acquisition, so called ‘Economical Parameter Setting’ with the Feature-Construction Hypothesis in L1 and the Feature-Reconstruction (Problem) Hypothesis in L2 (by adults) (Bong 2005 onwards) by testing their predictions on the development order and L1 transfer as well as other factors, this study has set out to investigate ‘L2 learning strategy’ or ‘L2 acquisition process’ so as to determine the development order (i.e. the differential difficulty) of the senses/uses of the preposition ‘*with*’ in L2 acquisition.<sup>4</sup> This investigation is carried out by examining roles of the lemmatic (syntactic-semantic) properties of the preposition ‘*with*’ of the L2 (English), and of the post-positions of the L1 (Japanese) in L2 acquisition, identifying what roles of the learners’ dictionary or of the L2 learning environment setting with respect to un-natural or institutional ‘input presentation’ would play in L2 acquisition under the foreign language learning environment in Japan.

This paper begins with an overview of linguistic background and rationales for the current experimental study, followed by the methodology of the study. Then the following section presents the results, and discusses implications of findings. Finally, the last section concludes the discussions and presents some implications of the current study.

## 2. Linguistic Background and Rationale

### 2.1 Feature Based Lexicon-Contact View: The Economical Parameter Setting Model

In the Economical Parameter-Setting model (Bong 2005, 2009), learners have a built-in preference towards economical options, so that they consequently make and test hypotheses about the settings of parameters expressed in the triggering input according to their ability to parse the input. The model has been further expanded and applied to the level of lexicon: that is, the learners, in the *Selection* operation to form a lexicon, make and test hypotheses about the sets of features for a language or even about the collections of features for each use/form expressed in the triggering input according to their ability to parse the input. This model assumes that the process of parameter-setting, that is, the process of language acquisition is governed by economy principles, which enforce the choice of economical options maximally compatible with the input strings, other things being equal. The main argument of this model is that the processes of *L1 acquisition*, *language change*, and *L2 acquisition* are governed by the *same economy principles*, but involve *different causal factors* in the divergence of parameter-settings and in the *Selection* of features in the lexicon from the inputs. Bong (2005) proposes that different causal factors are the quantitative and qualitative variability of input<sup>5</sup> and the role of L1 lexicon in L2 acquisition process (in other words, lexicon-contact view)<sup>6</sup>. These two factors both contribute to an increased obscurity and ambiguity of the settings of parameters and of sets of features embodied in the input. Thus, it is predicted that the settings of parameters and the sets of features formed by L2 learners can be different from those by native speakers or those expressed in the triggering input, owing to not only the existence of L1 but also the obscurity and ambiguity of meanings/senses used in the triggering input when L2 learners are parsing the input.

Let us now move onto the preposition ‘*with*’ with respect to its diachronic *language change* (owing to language acquisition through generations) to begin with, so as to clarify how the senses of the preposition ‘*with*’, in other words, the set of semantic features have changed or developed. According to the Oxford English Dictionary (2004), the word ‘*with*’ as a preposition is described in three parts: (I) Denoting opposition and derived notions (separation; motion towards); (II) Denoting personal relation, agreement, association, connection, union, or addition (senses denoting primarily activity towards or influence upon a person or thing.); and (III) denoting instrumentality, causation, or agency. The first part can be interpreted as denoting Spatial (+Physical) Relation as noted earlier, while the other two can be regarded as denoting Spatial (+/–Physical) or Abstract Relation.

In the earliest period, the prevailing senses of the preposition ‘*with*’ are those of **{opposition (against) and of motion or rest in proximity (towards, alongside)}**, that is, the senses are for rendering spatial relations. However, these notions of the preposition ‘*with*’ have passed (or changed) into figurative uses denoting various kinds of abstract relations. Interestingly, the remarkable development or change in the signification of ‘*with*’ is the fact that ‘*with*’ acquired in the Middle English period the chief senses belonging properly to the

preposition ‘*mið*’ of the Old English. These chief senses are mainly those denoting **{association, combination or union, instrumentality/means, and attendant circumstance}**. In addition, the last stage of ‘*with*’ was the extension of ‘*with*’ from the ‘**instrument**’ to the ‘**agent**’, in which sense it was used along with ‘*of*’ and ‘*through*’, and later with ‘*by*’, which finally superseded the other three. Nonetheless, it is important to note that the range of interaction of senses and sense-groups has been such that the position of a particular sense in the order of development is often difficult to determine. However, it is obvious that such changes were taken place by means of language acquisition through generations: one generation might have a slightly different collection (i.e. **Selection**) of senses (semantic features) for the same form (i.e. same phonological or morphological features) from the other generations as native speakers of modern English definitely have a different collection of senses from native speakers of Old or Middle English. In addition, such language change is argued to have been caused by various causal factors such as obscurity and ambiguity in the input, contact between languages (i.e. Lexicon-Contact), and so on (Bong 2005 onwards).

In Modern English, the senses of TYPE (I) have been analyzed as either (i) being taken over by the chief senses of the preposition ‘*mið*’ of the Old English or being absorbed by or (ii) transmitted into such prepositions like ‘*against*’, and ‘*from*’ for the senses of **{of separation or deliverance}**, or having developed into being associated with the senses of TYPE (II). For example, the senses of **{near or close to; against, alongside}** are now associated with **{in the same direction as; along the course of}** of TYPE (II) especially in such phrases as *with the grain, with the hair, with the stream, with the tide, with the wind*. The senses of **{into the presence or immediate proximity of (and in derived figurative uses)}** following such verbs as *encounter, fall in meet*, etc. of TYPE (I) are now associated with the senses of TYPE (II) as **{senses expressing accompaniment or addition}** as in (a) following words expressing such meanings as *accompany, ally, alternate, associate, blend, combine, confront, connect, couple, entangle, incorporate, join, link, marry, mix, partake, share, unite, wed* and so on; (b) following words expressing acquaintance or familiarity such as *accustom (ed) with, now replaced by to*; and (c) by extension, following words expressing separation: e.g. *to break with = to break off connection with, to part with = to cease to be with or to have with one*.

Importantly, the reason why the first change in the collection (**Selection**) of senses took place (marked as (i) above: being taken over by the chief senses of the preposition ‘*mið*’ of the Old English) took place is that it was presumably or assumed to be due to its contact with Greek *μετά*, which cognates with ‘*with*’ in Modern English, as a result of **Lexicon-Contact** between the two languages (see Bong 2005 onwards.). As for the second change (marked as (ii) above: transmitted into such prepositions like ‘*against*’, and ‘*from*’ for the senses of **{of separation or deliverance}**, or having developed into being associated with the senses of TYPE (II)), a plausible account is that owing to causal factors such as ambiguity and obscurity of the uses/sense of the preposition in the input (Bong 2005 onwards), the senses of **{near or**

**close to; against, alongside}** are now associated with **{in the same direction as; along the course of}** of (II) especially in such phrases as *with the grain, with the hair, with the stream, with the tide, with the wind*. The senses of **{into the presence or immediate proximity of}** (and in derived figurative uses) following such verbs as *encounter, fall in, meet*, etc. of (I) are now associated with the senses of (II) as **{senses expressing accompaniment or addition}** as in (a) following words expressing such meanings as *accompany, alternate, associate, blend, combine*, and so on; (b) following words expressing acquaintance or familiarity such as *accustom (ed with, now replaced by to)*; and (c) by extension, following words expressing separation: e.g. *to break with = to break off connection with, to part with = to cease to be with or to have with one*. Note that the senses of the OLD or ORIGINAL prevailing senses of this preposition, namely **{opposition (against) and of motion or rest in proximity (towards, alongside), separation}** are still extant.

In short, under the assumptions of the Feature Construction/Reconstruction Hypothesis derived from the Economical Parameter Setting Model of language acquisition, these semantic changes can be easily accounted for since the hypothesis takes into accounts the lexicon-contact between languages in L1 acquisition, and views L2 acquisition as one of the cases of lexicon-contact. That is, L2 acquisition as a matter of course results in contacting L1 lexicon with a L2 lexicon of the Input formed by/figured out by the L2 learners, not necessary with the L2 lexicons of the native speakers. In addition, the hypothesis predicts that the L2 learners would or might have a **different set** (i.e. **Selection** or collection) of syntactic and semantic features (maybe of phonological features as well) for the preposition ‘with’ from the set of features assumed for the native speakers or expressed in the triggering input owing to the obscurity and ambiguity of the set of features and the contact between the L1 lexicon and a L2 lexicon parsed from the triggering L2 input through making and testing hypotheses about the settings of parameters and the sets of features (including syntactic features, semantic features, and phonological features).

## 2.2 The Proto Theory based Analysis: The Cognitive Language Acquisition Model

Let us now move onto the competing theory of the semantics of the preposition, namely prototype theory based analysis derived from the Cognitive model of language acquisition. Before moving onto rationales for the current experimental study on the preposition ‘with’, it seems important to note that the theory of prototype is a mode of graded categorization in the semantics of preposition within the framework of cognitive linguistics (e.g. Dirven 1993, Herskovits 1988). In the theory, senses of prepositions are hierarchically organized or some are more central than others, so that each preposition has a prototypical sense (or prototypical senses) and lower/less prototypical senses: for example, in the order of the most prototypical sense or ‘Core Concept’, the 2<sup>nd</sup> most prototypical sense, the 3<sup>rd</sup> prototypical sense and so on. To be more precise, the most typical senses of prepositions are ‘locative and literal senses’ while the least prototypical ones are ‘abstract senses’.<sup>7</sup> In the application of the theory to L2

acquisition, proponents of the prototypicality hypothesis claim that prototypical senses are easy to acquire, while less prototypical ones are more difficult to acquire.

What would be the core concept of the preposition ‘with’? Proponents of cognitive grammar have attempted to delineate the core concept of ‘with’ and suggested that the core concept of the preposition ‘with’ in modern English is the concept of [**Accompany**], while unfortunately there is not a specific or plausible account of why and how the core concept of ‘with’ in Old English, namely {**opposition**}, had changed into or had been taken over by the chief senses of the preposition ‘*mið*’ of the Old English. Unlike this cognitive account, it is argued and suggested that it was due to its contact with Greek *μετά* cognates with ‘with’ in Modern English as a result of Lexicon-Contact between the two languages in the minimalist framework (see Bong 2005).

Under the cognitive theory, all senses of any polysemous word (such as prepositions) are assumed to be related to one another. The polysemous word has a prototypical sense (or prototypical senses), and other less prototypical ones extending in some way from the prototypical sense (senses) (Hayashi 2008). Upon this model, the preposition ‘with’ in question is to have a prototypical sense [**Accompany**] and less prototypical ones that are derived in the process of extension from the prototypical sense (or senses). Under this theory, L1 acquisition of English prepositions is referred to as an extension process of cognitive principles in learning schematic properties of prepositions (and any polysemous words) through body movement assuming ‘semantic relatedness’ between senses of prepositions and other Schematic Principles that are operative, while L2A involves an extension of Schematic Principles, not through body movement, but via LA.

According to Moriyama et al (2010), the core concept of the preposition ‘with’ in modern English is noted as [**Accompany**]. Thus the core sense of [**Accompany**] is extended into various less prototypical senses. Of senses of the preposition ‘with’, the most prototypical sense is argued to be [**Equal Accompany**] as in ‘*I danced with her*’, in which the two objects can be connected by the word ‘together’. That is, the sentence ‘*I danced with her.*’ can be approximately rephrased as ‘*She and I danced together.*’ The next (second) most prototypical sense of the preposition is the sense of [**Method**], as in such a sentence like ‘*I broke the vase with a hammer.*’ in which unlike the sense of [**Accompany**], the two objects cannot be connected with ‘together’. The third prototypical sense of ‘with’ is [**Possession**] as in ‘*I love the girl with blue eyes.*’ The fourth prototypical sense is of [**Simultaneous Occurrence and Association**], which can be referred to as one of the TYPE II senses {**association, combination or union, instrumentality or means, and attendant circumstance**} as in ‘*I ran away with the gun in my hand.*’ The fifth prototypical sense is of [**Manner**] as in ‘*Handle it with great care.*’ On the other hand, the least (sixth) prototypical sense or the most abstract sense of the preposition ‘with’ is assumed to be [**Cause**] as in ‘*I was absent from my class with a high fever.*’ The order of the senses that are extensions from the core concept [**Accompany**] of the preposition ‘with’ can be illustrated as below:

**Table 1. The Prototypicality Order : Accompany**

	Senses	Prototypicality
+Physical	Equal accompany [Accompany]	I. The most prototypical
	Unequal Accompany [Method]	II. 2 <sup>nd</sup> most prototypical
-Abstract	Unequal Accompany [Possession]	III. 3 <sup>rd</sup> most prototypical
	Unequal Accompany [Attendant Circumstance]	IV. 4 <sup>th</sup> most prototypical
-Physical	Unequal Accompany [Manner]	V. 5 <sup>th</sup> most prototypical
	Unequal Accompany [Cause]	VI. The least prototypical
+Abstract		

However, as opposed to [Accompany], there seems to be another core concept of the preposition ‘with’: that is, the senses of TYPE (I) noted earlier {**opposition (against) and of motion or rest in proximity (towards, alongside), separation**} as in *break with one’s old friend*. However, the cognitive proponents attempt to interpret the concept or the sense of ‘Separation’ in the use of ‘with’ in ‘*break with one’s old friend*’ in the light of the concept [Accompany] by rephrasing the phrase as ‘*break [relations] with one’s old friend*’ in order to keep the sense of [Accompany] between the [relations] and [one’s old friend]. Although the concept of [Accompany] remains intact, the degree of the physical sense might have been lowered or become less prototypical than the physical accompany. Approximately, the degree of its prototypicality would be regarded as the sense of [Unequal Accompany: Attendant Circumstance] (4<sup>th</sup> most prototypical sense) between [relations] and [one’s old friend]. This line of linguistic description is related to the discussion of prototypicality about the test sentences given in Table 3 and Table 4 below. In addition, there seems to be another use of the preposition ‘with’ as in the following sentences:

- (1) [Unequal Accompany], [±Physical, ±Abstract] - [Attendant Circumstance]
- a. *With* my mother she takes a walk everyday.
  - b. She is patient *with* my mother.
  - c. I am *with* you on this issue.

The sentence in (1a) would be normally interpreted as ‘habit of’ or ‘**companion**’ or ‘in the companion of’ while the sentence in (1b) would be normally interpreted as ‘in regard to’ or ‘**attitude**’, and the sentence in (1c) as {**of the same opinion or belief**} or {**agreement**}. Nonetheless, the cognitive linguists or proponents of the prototypicality hypothesis interpret

these sentences as being used in the sense of [Accompany] between ‘habit’, ‘custom’, ‘truth’, or ‘opinion’ and the object of the preposition ‘with’ as in ‘with my mother’ or ‘with you’. The degree of ‘physicality’ would depend on the two objects related to the preposition: (1a) [Equal Accompany [+Physical, -Abstract, + Accompany]] since the concept ‘together’ would be applied as we can rephrase as ‘*She and my mother take a walk together.*’ (1b) is not [Equal Accompany [+Physical +Accompany]], since the ‘together’ criterion can be used for the sentence, but (1b) is associated with [Unequal Accompany [-Physical, +Abstract, + Accompany]], specifically [Attendant Circumstance] (4<sup>th</sup> most prototypical) between ‘*patience*’ and ‘*my mother*’. The same can be said to the sentence in (1c), namely [Attendant Circumstance] relation between my opinion and your opinion, [Unequal Accompany [-Physical, +Abstract, +Accompany]] (4<sup>th</sup> most prototypical).

### 2.3 Rationales and Research Questions

Given the assumptions of the prototypicality hypothesis in regard to the senses of the preposition ‘with’, it is now possible to test the hypothesis since under this prototype theory, it is clear which sense of the preposition ‘with’ is the easiest to acquire or the most difficult to acquire. On the other hand, if there is a case that the less prototypical senses are acquired earlier or more easily than the more typical ones, then we can say that the hypothesis is undermined or weakened. In order to test predictions on L2 acquisition of the English preposition ‘with’ by JSLs, derived from the Prototypicality Hypothesis and from the Lexicon Contact view (namely, the Reconstruction Problem), the current study was designed, and research questions were formulated as:

#### (2) Research Questions

- a. **Differential Difficulty:** Which senses of the preposition ‘with’ are easier (faster, develop earlier/faster) or more difficult than others?
- b. **Lexicon-Contact vs. Extension of the Core Concept:** What roles do lemmatic properties of L1 (Japanese post-positions, and Japanese translation of English prepositions) and of L2 (related to purely the senses of English preposition, and related to other factors such as contexts of the preposition appear) play?
- c. **Learning Strategy:** What role does the un-natural input of L2 play?

### 3. Methodology

The current experimental study conducted consisted of a proficiency test, which employed Allan’s (1992) Oxford Placement Test, and a cloze test into which various types of sentences with ‘with’ were incorporated. The data discussed below have been singled out for the current study of L2 acquisition of the preposition ‘with’. The experimental Japanese subjects were grouped into three based on their English proficiency results: elementary, pre-intermediate and intermediate. The details of the experimental subjects are illustrated in Table 2 below:



**Table 2. Details of Experiment Japanese Subjects**

Group (Number of Subjects)	OPT Mean	OPT Score Range
JSL G1 (13) (Elementary)	112.69 (56.3%)	100~120 (50%~60%)
JSL G2 (24) (Pre-intermediate)	124.67 (62.3%)	121~129 (60.5%~64.5%)
JSL G3 (20) (Intermediate)	137.65 (68.8%)	130~150 (65%~75%)
Total (57)	126.49 (68.8%)	100~150 (50~75%)

The cloze test was designed to investigate how JSLs use the preposition ‘with’, what elements are main factors in determining which sense of the preposition is used in English sentences, and which senses of the preposition are acquired or not acquired.

**Table 3. Sentences used in the experiment**

	Sentence	Prototypicality
1	He lives ( ) his parents. 彼は両親と同居している。	(I) Most Prototypical
2	She was standing ( ) a smile on her mouth. 彼女は口元に笑みを浮かべて立っていた。	(IV) 4 <sup>th</sup> most Prototypical
3	She is married ( ) four children. 彼女は結婚して4人のこともがいる。	(III) 3 <sup>rd</sup> most Prototypical
4	I am ( ) you on this issue. この問題については、あなたと同意見です。	(IV) 4 <sup>th</sup> most Prototypical
5	She avoided confrontation ( ) her neighbors. 彼女は隣人との対立を避けた。	(IV) 4 <sup>th</sup> most Prototypical
6	He graduated ( ) honor. 彼は優等で卒業した。	(VI) The least Prototypical
7	He loaded the truck ( ) timber. 彼はトラックに木材を積み込んだ。	(II), (III) 2 <sup>nd</sup> or 3 <sup>rd</sup> most prototypical
8	He was surprised ( ) the result of the game. 彼はその試合の結果に大いに満足した。	(VI) The least Prototypical
9	She was hospitalized ( ) appendicitis. 彼女は虫垂炎で入院した。	(VI) The least Prototypical
10	She left her children ( ) a wet nurse on the party. 彼女はパーティの夜、子供を乳母に預けた。	(I) Most Prototypical
11	I parted ( ) a convertible the year before last. 私は一昨年、オープンカーを手放した。	(IV) 4 <sup>th</sup> most Prototypical
12	She was bent ( ) age. 彼女は年で腰が曲がっていた。	(IV) 4 <sup>th</sup> most Prototypical

The sentences used in the experimental task were presented in both English and Japanese in order to provide clear contexts for the participants, and to find out whether JSLs make use of Japanese translation of each sentence when they fill the gap in the cloze test.<sup>8</sup> There were twelve sentences with the preposition ‘with’ employed in the experiment. They were administered in a random order. For the sake of discussion, the order of the sentences illustrated in Table 3 is actually based on the results of the cloze test on the sentences supposed to be with the preposition ‘with’. In addition, sentences are also grouped based on the range of the experiment results. In addition, I have indicated those extended senses from [Accompany] which is assumed to be the core concept of the preposition ‘with’ developed in the literature of the prototype theory as illustrated in Table 1. Now let us now categorize those senses used and identify what senses of the preposition ‘with’ are used as denoting the range from the most prototypical sense with [Equal Accompany], [+Physical], [Accompany], namely the locative and literal senses to the least prototypical sense [Unequal Accompany], [+Abstract], [Cause], namely the abstract and more extended senses from the core concept: in identification of what senses of the prepositions are more prototypical than others. Let us now examine the results of the current experimental study on L2 acquisition of English preposition ‘with’ by JSLs.

#### 4. Results and Discussion

##### 4.1 Overall Results

The cloze test is employed to measure learners’ ability of production, and to see how JSLs complete (form) each sentence with the English preposition ‘with’, the 12 sentences with Japanese translation were employed in the cloze test. Based on the Standard English criteria for the preposition occurrences obtained from English native speakers’ judgment and completion of the task, I have counted adequate preposition insertions (productions) in sample of 57 JSLs of English, cross-classified by three proficiency groups, displayed below.

**Table 4 Adequate English Preposition Placements – Acquired**

	JSL G1(13) (Elementary)	JSL G2 (24) (Pre-Intermediate)	JSL G3 (20) (Intermediate.)	<b>Total (57)</b>
<b>1 (I)</b>	8/13 (61.5%)	21/24 (87.5%)	19/20 (95.0%)	<b>48/57 84.2%</b>
<b>2 (IV)</b>	8/13 (61.5%)	16/24 (66.7%)	17/20 (85.0%)	<b>41/57 71.9%</b>
	<b>61.53%</b>	<b>77.1%</b>	<b>90.0%</b>	
● These two sentences 1(I) and 2 (IV) are classified as A (acquired).				

**Table 5 Adequate English Preposition Placements - Developing**

<b>3</b> <b>(III)</b>	5/13 (38.5%)	6/24 (25.0%)	10/20 (50.0%)	<b>21/57</b> <b>36.8%</b>
<b>4</b> <b>(IV)</b>	3/13 (23.1%)	9/24 (37.5%)	5/20 (25.0%)	<b>17/57</b> <b>29.8%</b>
<b>5</b> <b>(IV)</b>	1/13 ( 7.7%)	7/24 (29.2%)	8/20 (40.0%)	<b>16/57</b> <b>28.1%</b>
<b>6</b> <b>(VI)</b>	3/13 (23.1%)	3/24 (12.5%)	7/20 (35.0%)	<b>13/57</b> <b>22.8%</b>
● These four sentences are grouped as D (developing)				

**Table 6 Adequate English Preposition Placements – Early Stage of Developing**

<b>7</b> <b>(II)</b>	0/13 ( 0.0%)	2/24 ( 8.3%)	4/20 (20.0%)	<b>6/57</b> <b>10.5%</b>
● This sentence is grouped as E (Early Stage Developing)				

**Table 7 Adequate English Preposition Placements – Failed or Misdeveloped**

<b>8</b> <b>(IV)</b>	1/13 ( 7.7%)	1/24 ( 4.2%)	1/20 ( 5.0%)	<b>3/57</b> <b>5.3%</b>
<b>9</b> <b>(VI)</b>	2/13 (15.4%)	0/24 ( 0.0%)	1/20 ( 5.0%)	<b>3/57</b> <b>5.3%</b>
<b>10</b> <b>(I)</b>	1/13 ( 7.7%)	1/24 ( 4.2%)	1/20 ( 5.0%)	<b>3/57</b> <b>5.3%</b>
<b>11</b> <b>(IV)</b>	1/13 ( 7.7%)	0/24 ( 0.0%)	1/20 ( 5.0%)	<b>2/57</b> <b>3.5%</b>
<b>12</b> <b>(IV)</b>	0/13 ( 0.0%)	1/24 ( 4.2%)	1/20 ( 5.0%)	<b>2/57</b> <b>3.5%</b>
● These five are grouped into F (failed or misdeveloping)				
<b>Sum</b>	32/156 (20.5%)	66/288 (22.9%)	75/240 (31.3%)	<b>170/684</b> <b>24.8%</b>

Note that Roman numbers in the first column of the table indicates the types/degrees of the prototypicality as discussed in Table 1.

The frequency results of the senses test suggest that there seem to be four groups of tokens based on their performance levels as indicated in Table 6 above: I termed the four groups as

Acquired, Developing, Early-Stage of Development, and Failed or Misdeveloping respectively for the convenience of the current discussion. Of the four groups, the first group, the Acquired, in which two sentences are different from each other in regard to their senses/uses or their degrees of prototypicality appear to be acquired by the JSLs. The result of the Acquired Group indicates that they have developed or acquired at least the two different senses of the preposition ‘*with*’ earlier than the other three groups of sentences, results of which in turn suggest that those types of senses of the preposition ‘*with*’ should be difficult for L2 learners to acquire, or more difficult to acquire than the first two senses or other grammatical aspects that were used in the English proficiency test (Allan 1992).

Although the cloze text was employed to have increased the performance level since it would be very difficult to obtain natural production data from L2 learners, the performance of inserting the preposition ‘*with*’ on those three groups of tokens (Developing, Early-Stage Development, and Failed or Misdeveloping) are rather low, and lower than their performance on other grammatical aspects as indicated in Table 2.

Let us now examine each group more thoroughly with respect to relationship between L2 performance and L2 acquisition hypotheses on differential difficulty, L1 transfer, and L2 input quality.

#### **4.2 Against the Prototypicality Hypothesis**

Recall **the development order claim** of the Prototypicality Hypothesis (PH) that the acquisition developmental order of the senses of the preposition ‘*with*’ in L2 acquisition is predicted as the I degree of prototypicality is easier than the II, which then is easier than the III: that is, in the order of I>II >III>IV>V>VI, under the PH. However, predictions of this kind are **not well supported by** the data presented in Table 4, 5, 6, and 7.

In addition, **the differential difficulty claim** of the PH is that both L1 and L2 learners begin with the core concept of the word, or the most prototypical sense of the preposition, and find it easier to acquire than other senses that result from extensions of the core concept [Accompany] in the current case. Unfortunately, the claim was not confirmed in the current study. There were two tokens of the most prototypical use/sense of the preposition ‘*with*’: one is the sentence 1 and 10 in Table 3. L2 learners performed much better with the sentence 1 (84.2% achievement) while they performed worse on the sentence 10 (5.3% achievement). Results of this kind again **undermine the differential difficulty claim of the PH.**

Moreover, the PH can neither predict such results, nor account for the difference between the two sentences (1 and 10) with respect to both the core concept or most prototypical sense under the prototypicality hypothesis and the L1 influence. However, one might argue for **L1 influence claim or the claim of L2 learning strategy,** namely a ‘*via L1*’ learning strategy. However, it couldn’t be the case that L2 learners figure out (or acquire) the core concept of the preposition ‘*with*’ via their L1 Japanese, since Japanese doesn’t have an equivalent post-position to the preposition ‘*with*’ in English, but has various translations or dictionary

descriptions: such as *~to tomoni* for the sense of *to be together*, or *to isshouni* for the sense of *to accompany*. In addition, under the PH, the sense of the preposition ‘with’ in the 10<sup>th</sup> sentence-*She left her children with a nanny on the party night.*-is obviously denoting ‘Accompany’, ‘*her children and a nanny are being together*’ as noted in the proto theoretical criterion of the core concept/sense [Accompany] and its extension to [Equal Accompany],: that is, concrete objects, namely the two people are literally being together. Thus, the results suggest that the claims of the PH about the earlier acquisition of the core concept/sense and about Via L1 Learning strategy need to be amended or revised.

In short, the differential difficulty claim, the learning strategy claim (via L1), and the core concept claim of the Prototypicality Hypothesis are not supported by the results presented above. Instead the data cast doubt on the Prototypicality Hypothesis and thus undermine its claims about L2 acquisition.

### 4.3 Alternative Accounts

On the other hand, the other competitive view, namely the **Lexicon-Contact view** under the Minimalist Model of language acquisition can provide plausible accounts of the data remaining unexplained under the PH. For example, as noted in Bong (2011, 2012, 2013), the structural complexity of the token sentences seems to play a role in determining the developmental order: the 10<sup>th</sup> sentence is structurally more complex than the first sentence. In addition, the role of PP (*with a nanny*), which is subcategorized by the verb in relation to the object NP (*her children*), is not just simply semantic, but also carries syntactic properties: that is, both syntactic and semantic properties of the PP should be taken into account. In short, it seems to be more plausible to consider the results from the ‘Lexicon-Contact’ view, testing the Feature Reconstruction Hypothesis and both syntactic and semantic properties must be considered in examining L2 data of this kind.

Recall the discussion on the senses (meanings, uses) of the preposition ‘with’ in connection to ‘language change’ from the Lexicon-Contact view derived from **the Feature Re/Construction Hypothesis** (Bong 2005 onwards). Under this view, a set of features for a lexical item (a word) in a particular language can change as a result of contact with a language or languages that has (have) lexical items with a similar set of features. Some of the features of one language are incorporated into another language (or into a set of features for a particular lexical item in a language) in the construction process of features: that is, the Feature Construction Process is seen as the process of learning lexical items for individual languages. When two languages are in contact as seen in the contact between the English ‘with’ and the Greek *μετά* which cognates with ‘with’, this contact has given rise to the meanings of the current English by absorbing some of the senses (or some features) of the Greek word *μετά* so as to form a different set of features for the preposition ‘with’: that is, the Feature Re/Construction Hypothesis (Bong 2005 onwards). Such language changes are motivated by the linguistic fact that the Old English ‘*mið*’ had a similar set of features to that

of the Greek word *μετά*. In short, Bong (2005 onwards) argues that language changes occur via language acquisition through generations, and that L2 acquisition is in fact to be discussed in terms of ‘language acquisition’, ‘language change’ due to language contact between L1 and L2. In other words, under this view, it is not necessary to set up specific rules or criteria to set up or to put forward the core concept of each lexical item (each word).

Let us now move onto **the Learnability issue**. Recall that under the Proto theory or the Prototypicality Hypothesis, each word has a core concept, which is then extended depending on different contexts or on learning environment in both L1 and L2 acquisition. Their learnability claim is that language acquisition is the process of learning each core concept of all words in a language (hundred thousands of vocabulary) first and then of extending the core concepts of those words to learn other meanings (senses) of those words (extensions of the core sense). This in fact makes it impossible for a child to learn a language in her/his life time since she/he cannot come across all the words and all the uses (senses) of each word of a language in one life time. On the other hand, within the minimalist framework, we human beings are assumed to be able to construct a particular meaning (sense) of a lexical item in a particular context that we have not been exposed to before or experienced before. Such processes of construction of and selection of features from a universal set of features are innate in our human nature. In short, the proto theory-acquisition hypothesis does not seem to be able to account for the Learnability of a language while the Feature Re/Construction Hypothesis can account for both language change and various senses of a lexical item depending on the context. I suggest that the deeper mechanism of the learning process or the L2 learning process is to be further studied in order to identify the factors that would contribute to determining the development order of senses of a particular lexical item (word) in L2 or L1 acquisition.

## **5. Conclusion**

We have examined the findings and discussions in relation to the research questions set out from the beginning as in (2). First of all, there is no evidence found to support the claims of the prototypicality hypothesis. First, the development order claim of the PH was not supported, but undermined by the findings that the development order was not in conformity with the order predicted by the PH: that is, the most prototypical sense is easier to acquire than the less prototypical ones. Secondly, we found some evidence against the differential difficulty claim of the PH that the core-concept of any polysemous words is learned first or earlier/more easily than other senses. We found that it is not always the case that the most prototypical sense of the preposition ‘*with*’, namely [Equal Accompany], [+Physical], [Accompany], as a result of an extension of the core concept [Accompany] of ‘*with*’, which gives rise to the locative and literal sense [+Physical Equal Accompany] is always acquired earlier or more easily to acquire than less prototypical ones or less locative and less literal senses. Thirdly, we found no

evidence that the L1 Japanese is manipulated by the L2 learners in the acquisition of the English preposition ‘with’. That is, the learning strategy claim of both L1 influence claim and the L2 learning via L1 under the PH is not supported by the current study. Alternatively, the Lexicon-Contact view derived from the Feature Re/Construction Hypothesis can provide a plausible account of the data that remained unexplained by the PH. In addition, the claims of the Feature Re/Construction hypothesis are supported by the current findings, since Learning Strategy, Learnability, and many other causal factors other than the core concept and its extension are involved in determining the differential difficulty of various senses of a lexical item.

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<sup>1</sup> According to the Dictionary of Psychology, Aphasia is usually the result of disease or injury, such as a stroke or partial brain damage, that affects an area of the brain that controls language. The most well-known areas are Broca’s and Wernicke’s.

<sup>2</sup> Representative functional words (c.f. functional categories) include Articles, Pronouns, and Conjunctions.

<sup>3</sup> The Lexico-Syntactic Operation, ‘Construction’, is sometimes called ‘Assemble’ in some literature.

<sup>4</sup> Note that the development order has been discussed under the topic of the differential difficulty in the L2 acquisition of the various senses of prepositions in the literature.

<sup>5</sup> For example, learning environment can influence the degree of ‘obscurity and ambiguity’ in the input qualitatively and quantitatively, which then become one of the causes to form a different set of features for a language from the set entailed or expressed in the input

<sup>6</sup> Adult L2 acquisition always involves the ‘L1’ of the learners and thus gives rise to the contact between the L1 lexicon that the learners have already formed or set and a L2 lexicon parsed from the input by the L2 learners, not necessarily the target L2 lexicon assumed to be the L2 native speakers’.

<sup>7</sup> This paper will not discuss any theoretic problems or arguments over defining prototypicality or arbitrariness of the prototype concept.

<sup>8</sup> The sentences used in the experiment were selected, after studying and modifying sample sentences from Ishii (2008) in order to meet the requirements of the current experiment design.

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