

## **Preliminary Analysis of Grammatical Judgement Test: dative constructions and their passive forms**

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### 1.0 Introduction

In this paper we argue that the syntactic relationship between dative constructions and their passives can be explained by Lexical Mapping Theory (LMT) within the framework of Lexical Functional Syntax (LFS). LMT bridges the connection derived from argument structures to grammatical functions, suggesting that learners' semantic understanding in the form of argument structures influence learners' grammatical judgements.

There were four kinds of sentences: (1) prepositional to-datives and for-datives; (2) their di-transitive counterparts; (3) passive sentences of prepositional datives; (4) passive sentences of the di-transitive ones. There were some items which cannot be regarded as dative sentences so that we can test whether the learners can differentiate dative constructions from non-dative constructions. We also tested whether animacy effects in subject nouns can influence learners' grammatical judgements.

356 students from the four university took part in the grammatical judgement tests. Firstly, we will examine the results from the view points of the earlier and stable acquisition of unmarked forms, iconicity, animacy effects seen from the subjecthood hierarchy in LFS and ill-formed passives predicted from LMT. Secondly, we will look at the results with respect to their level of grammatical competence. For this reason, the subjects we dealt with are restricted in that they need to have taken all the grammatical judgements tests; consequently, 235 subjects remained for our analysis and they are classified into four groups in terms of their Grammatical knowledge which is assessed by measure of English Grammar (MEG): see Shimizu et al. (2003). The grammatical judgment tests are examined from the view points of their level of MEG. Sugino et. Al (2003) illustrated that there were four types of subjects: syntax dependent, transitional, meaning dependent and cue unconscious groups who can be defined by MEG scores as follows:

Cue unconscious participants: below 49 points

Meaning dependent participants: between 50 -59 points

Transitional participants: between 60 – 79 points

Syntax dependent participants: more than 80 points

We can characterise these groups as learner judgement strategies below, since cue unconscious participants are those whose grammatical judgements are 'uncertain'; meaning dependents are those

whose grammatical judgements rely on argument structure in LFG; syntax dependents are those who can map from argument structures to grammatical functions; that is, they can possess Lexical mapping abilities. Transitional participants are between meaning dependents and syntax dependents.

## 2.0 Method

356 university students who are majoring in various subjects at the four different universities in Japan took part in the experiment of grammatical Judgement tests concerning dative alternations and passive forms. The Grammatical Judgment Test consisted of 48 items: see below and Appendix 1. As for the preliminary analysis, we dealt with all the 356 judgements in Section 4.0.

Prior to the experiment, most of them took Measure of English Grammar (MEG) test. MEG consisted of 110 items which are divided into two parts: Part I (CELT Form A- Grammar Section) and Part II (Oxford Placement Test – Grammar Test) + TOEIC (Structure Section). Initially, we had 213 items but we eliminated the poor items on the basis of point-bi-serial coefficients to maintain the good degree of item discriminations:  $0.2 < P_{bi} < 0.4$ . Also, Item difficulty should be  $0.3 < x < 0.8$ . As a result, we obtained 110 items. We also examined MEG in terms of Reliability (KR-20: 0.910), and Validity ( $r = 0.959$  with CELT and  $r = 0.844$  with Oxford test). For our second analysis to see the relationship between four kinds of judgement strategy groups and grammatical judgements, we restricted the number of students; we only dealt with those who took part in the other grammatical tests such as relative clause tests, logical subject tests, and unergative vs unaccusative test. So, for the second analysis in Section 5.0, we dealt with 235 subjects.

## 2.1 Materials for Grammaticality Judgement Task and LFS Predictions

### 2.1.1 Materials for Grammaticality Judgement Task and marking scheme

There are 48 items in the Grammaticality Judgement Task. The participants are instructed to rate the grammaticality of each sentence on the 5-point scale: (-2) totally unacceptable – (2) totally acceptable. The raw scores are converted according to the following criteria:

1 When a well-formed sentences as rated as 2 or an ill-formed sentences as rated as -2, we give 4 points.

2 When a well-formed sentences as rated as 1 or an ill-formed sentences as rated as -1, we give 3 points.

3 When a well-formed sentences as rated as 0 or an ill-formed sentences as rated as 0, we give 2 points.

4 When a well-formed sentences as rated as -1 or an ill-formed sentences as rated as 1, we give 2 points.

5 When a well-formed sentences as rated as -2 or an ill-formed sentences as rated as 2, we give 0 points.

For the sake of convenience, the 48 items are grouped into 6 and syntactic features are explained below:

Group A: Well-formed ditransitives

A01-A04: to-datives: predicate< -o, -r, +o >

A01 and A03: + Human Subject Noun

A02 and A04: - Human Subject Noun

A05 – A08: for-datives: predicate < -o, -r, +o>

A05 and A07: + Human Subject Noun

A06 and A08: - Human Subject Noun

Group B: Ill-formed ditransitives

B01 – B04: ill-formed to-datives

B01 and B03: + Human Subject Noun

B02 and B04: - Human Subject Noun

B05 – B08: ill-formed for-datives

B05 and B07: + Human Subject Noun

B06 and B08: - Human Subject Noun

Group C: Prepositional datives

C01- C04: Prepositional to-datives: predicate<-o, -r, +r>

C01 and C03: + Human Subject Noun

C02 and C04: - Human Subject Noun

C05 – C08: Prepositional for-datives: predicate<-o, -r, +r>

C05 and C07: + Human Subject Noun

C06 and C08: - Human Subject Noun

Group D: Distracter Items which appear to look like prepositional to-datives and prepositional for-datives, four items for each distracter type.

- D01 Mr. Jones reported the accident to me. <agent, theme, goal>, <-o, -r, +r>  
D02 The police reported the fire to Bill.  
D03 My wife moved three golf clubs to me.



According to this framework, di-transitive forms are lexically formed from the mono-transitive forms. These lexical alternations exist in English, but they are missing in French and German. Many L2 acquisition studies have supported this position; that is, prepositional datives are acquired earlier than di-transitive counterparts are: e.g., O’Grady (2001), Nakano (2001), etc. However, there is one exception in L1 acquisition studies. Snyder and Stromswold (1997) showed that L1 infants acquire di-transitive forms earlier than the prepositional datives, since their mothers use di-transitive forms much more often than prepositional mono-transitive forms. We can regard this exception as derived from the effect of Input (Input Hypothesis). It is true that situational factors determine which form is relevant, di-transitive or mono-transitive, in the context of situation. The situational factors include given/new information and end-weight principle. Bresnan (2003) attempts to explain how situational factors determine a speaker’s production form within the framework of Optimality Theory. We are not concerned here with the process of how situational factors determine a specific production form, but with the internal state of a learner’s grammatical knowledge in which unmarked options would be stored more readily. So, our prediction is that unmarked forms will be more readily accepted by Japanese learners of English. Since prepositional datives are syntactically identical to the transitive clause with prepositional phrases, in terms of unmarkedness, we might say that they will be learned or accepted by the learners. However, the prepositional datives are more iconic than transitive clauses with prepositional phrases: see also (3). In terms of iconicity, the prepositional datives will be more readily learned by the learners.

In brief, our prediction follows the following pattern:

Prepositional datives → transitive clauses with prepositional phrases → Ditransitive forms  
 Unmarked <.....< Marked

Due to the iconicity, our prediction would be more precisely stated as follows:

Prepositional to-dative → Prepositional for-dative → transitive clauses with prepositional phrases  
 → Ditransitive forms

### 3.2 the animacy effect derived from Subjecthood Hierarchy

LFS has included as a part of the theory such Hierarchy of Subjecthood in terms of arguments since the beginning of the classical LFG:

Agent > beneficiary > recipient > ... > patient/theme > location

Bresnan (2001:11)

According to this, agent-like entities that are at least animate and volitional are the most likely candidate for subject of a sentence. In our grammaticality judgement task, there are 32 sentences belonging to Groups A, B, C and D, half of which have [+human] features in their subjects of the sentences. In the remaining half, subject nouns are institutional names such as police or company, and the subject noun ‘family’ is ambiguous in this respect. We will hypothesize that sentences with

[+human] subject nouns will be accepted more readily than the others.

### 3.3 Presence of iconicity in to-datives which favours the higher rate of acceptability in the to-datives than that in the for-datives

When we compare prepositional to-datives with prepositional for-datives, we can intuit that there is a dynamic movement of an entity from the agent to the goal in the former, but that there is not such a dynamism in the for-datives:

Tom gave an apple to me.	Mother cooked a meal for the children.
Source/agent → →goal	Agent beneficiary

This intuition is commonly called ‘iconicity.’ So, we have one more reason for the higher acceptability in prepositional to-datives here. Likewise, the double object sentences are non-iconic, compared with the single object sentence where the word order matches the manner in which the event unfolds:

Tom	gave	an apple	to me.
Source/agent		theme	goal
Tom	gave	me	an apple.
Source/agent		goal	theme.

In this sense, the prepositional to-dative is most iconic; therefore, more acceptable for the learners; hence, prepositional to-datives will be accepted more readily by the learners than those of for-datives.

### 3.4 ill-formed passives vs well-formed passives

The double object sentences can produce the two kinds of passives in theory, if either of the two objects can be moved into the subject position. However, native speakers of English will indicate that one of them is ungrammatical.

\*An apple was given me by Tom.

I was given an apple by Tom.

How should we be able to account for this discrepancy? In LFS, we have a Lexical Mapping Theory (LMT) to deal with this problem. The basic mechanism of LMT is in order. LMT relates arguments (theta roles in Generative Grammars) to grammatical functions such as subj, obj, obj2 and obl(ique). LMT assigns four features to each argument:

[-o] means that it cannot be obj; therefore, it is a candidate for subj. Agent-like arguments receive [-o].

[+o] means that it must be obj or obj2. Secondary patient-like roles tend to receive [+o].

[-r] means that it is unrestricted; therefore, it can be subj or obj. Patient-like roles tend to

get [-r].

[+r] means that it is restricted; in the case of English, to prepositional phrases [+r] is typically assigned.

Rule 1: If an argument is given [-o] and it is the initial argument in the argument-structure, it is given a subject function.

Rule 2: If not, the item with [-r] is given a subject function.

Rule 3: The item with [+r] is given an oblique function.

Rule 4: The function assignment follows the partial ordering:

subj > obj and obl > obj2

Let us apply these LMT rules for the passive constructions. For the following sentence, the argument structure is specified as below:

Tom gave me an apple.

Give < agent, goal, theme>

Then, the features will be assigned:

Give < agent, goal, theme>

[-o], [-r] [+o]

Goal is given [-r] and therefore it can be either object or subject. It is chosen as a subject, we will get the passive sentence:

I was given an apple by Tom.

However, theme role cannot be a subject, since it is marked as [+o]. Therefore, the following sentence is ill-formed:

\*An apple was given me by Tom.

Consequently, we have the following active/passive alterations:

Give < agent, goal, theme>            give< subj, obj, obj2>

Be given< goal, theme, by (agent)>    give < subj, obj, obl<sub>ag</sub>>

#### 4.0 Preliminary Analysis

##### 4.1 the higher rate of acceptability in unmarked forms as opposed to marked forms

In Section 3.1, we predicted that the prepositional datives (C) would be accepted by the participants more than transitive clauses with prepositional phrases (D) and di-transitive forms (A) would. Specifically our prediction of the acquisition order was in the order of C, D and A. This prediction was born out by our data, as shown in Fig. 1.

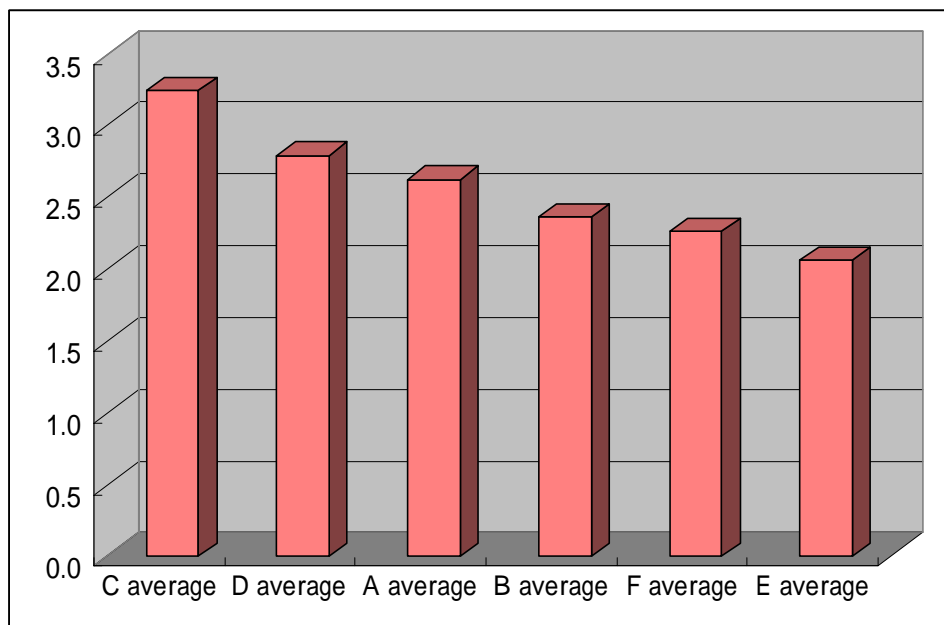


Fig. 1  
One-Way ANOVA

	No of Data	Mean	Unbiased Variance	SD	SEM
A	2848	2.6190309	2.43191	1.559458	0.029222
B	2848	2.3700843	2.175599	1.474991	0.027639
C	2848	3.241573	1.383139	1.176069	0.022038
D	2848	2.7865169	1.820935	1.34942	0.025286
E	2848	2.056882	2.612148	1.616214	0.030285
F	2848	2.198736	2.5267	1.58956	0.029786
Total	17088	2.5454705	2.314079	1.52121	0.011637

Analysis of Variance

Source	SS	DF	MS	F	P	F(0.95)
Total	39540.669	17087				
Between	2670.7892	5	534.1578	247.478	4.1E-256	2.214623
Within	36869.88	17082	2.158405			



Post-hoc test

Fisher's PLSD Level of significance: 5%

	Difference of Means	Critical value	P	
A,B	0.248946629	0.076312	1.65E-10	S
A,C	-0.622542135	0.076312	3.88E-57	S
A,D	-0.167485955	0.076312	1.7E-05	S
A,E	0.562148876	0.076312	5.55E-47	S
A,F	0.420294944	0.076312	4.42E-27	S
B,C	-0.871488764	0.076312	2.1E-109	S
B,D	-0.416432584	0.076312	1.29E-26	S
B,E	0.313202247	0.076312	9.2E-16	S
B,F	0.171348315	0.076312	1.08E-05	S
C,D	0.45505618	0.076312	1.93E-31	S
C,E	1.184691011	0.076312	4.2E-198	S
C,F	1.042837079	0.076312	7.4E-155	S
D,E	0.729634831	0.076312	1.37E-77	S
D,F	0.587780899	0.076312	3.6E-51	S
E,F	-0.141853933	0.076312	0.00027	S

Sheffe's Level of significance: 5%

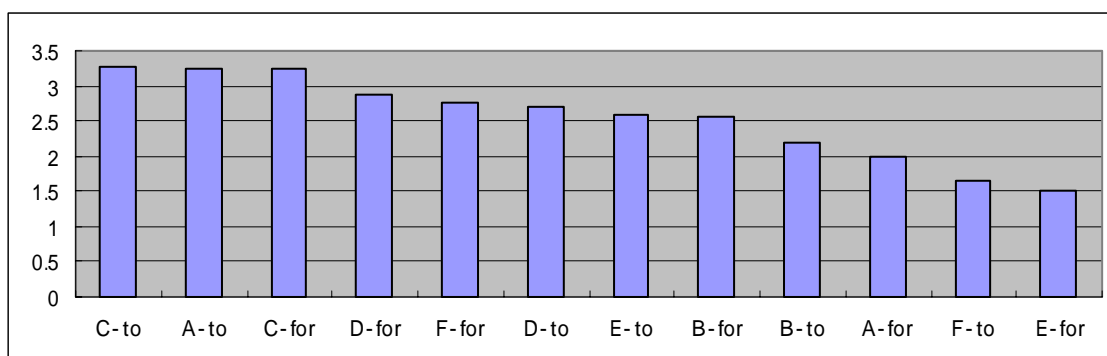
	Difference of Means	Critical value	P	
A,B	0.248946629	0.129553	1.01E-07	S
A,C	-0.622542135	0.129553	8.33E-53	S
A,D	-0.167485955	0.129553	0.002382	S
A,E	0.562148876	0.129553	8.01E-43	S
A,F	0.420294944	0.129553	2.04E-23	S
B,C	-0.871488764	0.129553	1.6E-104	S
B,D	-0.416432584	0.129553	5.73E-23	S
B,E	0.313202247	0.129553	1.36E-12	S
B,F	0.171348315	0.129553	0.001646	S
C,D	0.45505618	0.129553	1.21E-27	S

C,E	1.184691011	0.129553	1.1E-192	S
C,F	1.042837079	0.129553	1.2E-149	S
D,E	0.729634831	0.129553	5.49E-73	S
D,F	0.587780899	0.129553	6.18E-47	S
E,F	-0.141853933	0.129553	0.020961	S

Bonferroni/Dunn Level of significance: 5%

	Difference of means	Critical value	P	
A,B	0.248946629	0.114291	0.043364	S
A,C	-0.622542135	0.114291	0.018755	S
A,D	-0.167485955	0.114291	0.049701	S
A,E	0.562148876	0.114291	0.021968	S
A,F	0.420294944	0.114291	0.030774	S
B,C	-0.871488764	0.114291	0.008899	S
B,D	-0.416432584	0.114291	0.031037	S
B,E	0.313202247	0.114291	0.038453	S
B,F	0.171348315	0.114291	0.049403	S
C,D	0.45505618	0.114291	0.02846	S
C,E	1.184691011	0.114291	0.002792	S
C,F	1.042837079	0.114291	0.004869	S
D,E	0.729634831	0.114291	0.013866	S
D,F	0.587780899	0.114291	0.020564	S
E,F	-0.141853933	0.114291	0.051659	S

In what follows, we will subdivide the sentences into prepositional for-datives and to-datives and ditransitive for-datives and to-datives. When we accommodate Input Hypothesis, we have to amend our prediction stated in Section 3.1, since ditransitive to-datives are taught at school but ditransitive for-datives are not taught at least among MEXT authorized high school textbooks: see Ueda et.al (2004). In fact, the effects of Input becomes evident as the following figure and ANOVA demonstrates.



The prepositional datives and di-transitive to-datives (C-to, C-for and A-to) are on average accepted by the participants equally well. These three sentences yielded statistically no significant differences, according to the three kinds of statistics: Fisher's PLSD, Sheffe's and Bonferroni/Dunn's paired comparison. The other pairs which did not show statistically significant differences are B-for & E-to, B-for & E-to, D-to & E-to and D-to & F-for, according to Fisher's PLSD; A-for & B-to, B-for & D-to, B-for & E-to, D-to & E-to and D-to & F-for, according to Bonferroni/Dunn's; A-for & B-to, B-for & D-to, D-to & D-for, D-to & E-to, D-to & D-for, D-to & F-for, D-for & F-for according to Sheffe's statistics. We will regard as legitimate when the three statistics yield the equivalent results as marked in bold.

Fisher's PLSD :B-for & E-to, B-for & E-to, **D-to & E-to** and **D-to & F-for**

Sheffe's statistics :A-for & B-to, B-for & D-to, D-to & D-for, **D-to & E-to**, D-to & D-for, **D-to & F-for**, D-for & F-for, E-to & F-for, and E-for & F-to.

Bonferroni/Dunn's: A-for & B-to, B-for & D-to, B-for & E-to, **D-to & E-to**, **D-to & F-for** and **E-for & F-to**.

This result may seem to indicate that VT + PP (to) and Human subject passives of ditransitive to-datives came to be learned/accepted by the participants equally well. Likewise, by the time VT +PP(to) was learned, they tend to get confused by the ill-formed theme subject passives of ditransitive for-datives. This conjecture will be examined in Section 5.0.

#### 4.2 The animacy effects

According to the two-way ANOVA of repeated measures, there is a significant difference between human subjects and low animate subjects in terms of correct judgements. We also obtained a significantly different acceptances in sentence types A, B, C and D. There was a significant interaction between the two factors. As Post-hoc Test indicates, there is a strong main effect in terms

of the human versus low animate subject nouns.

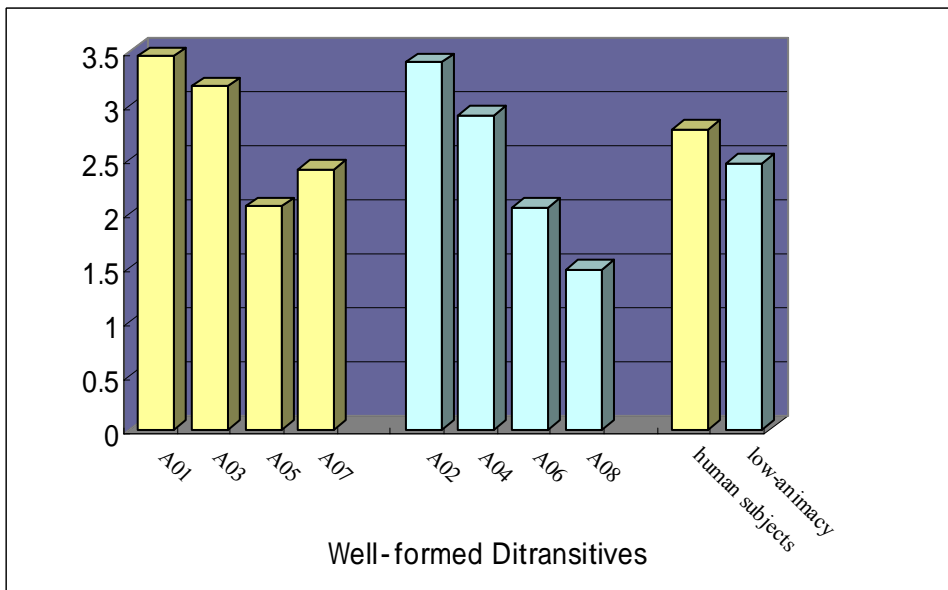
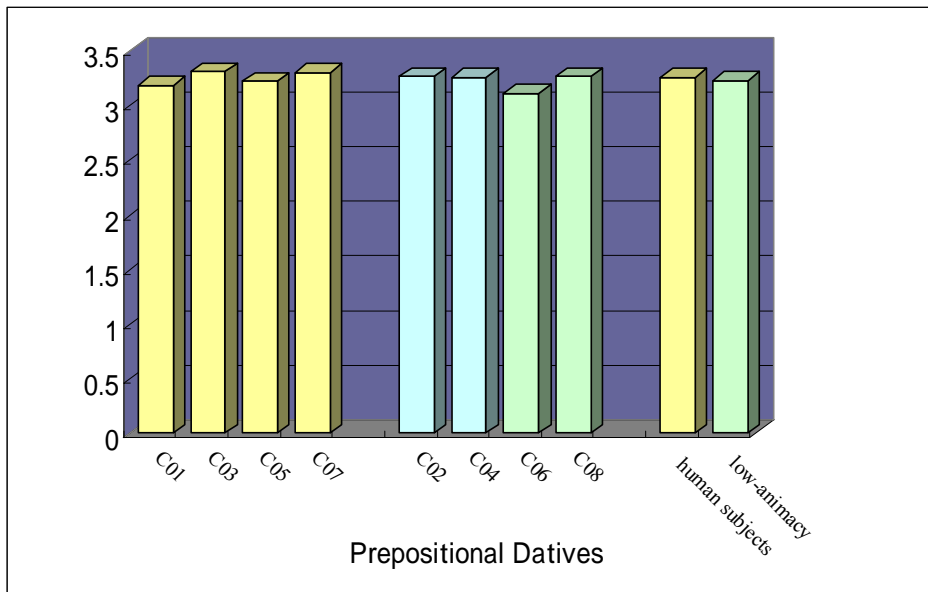


Fig. 2

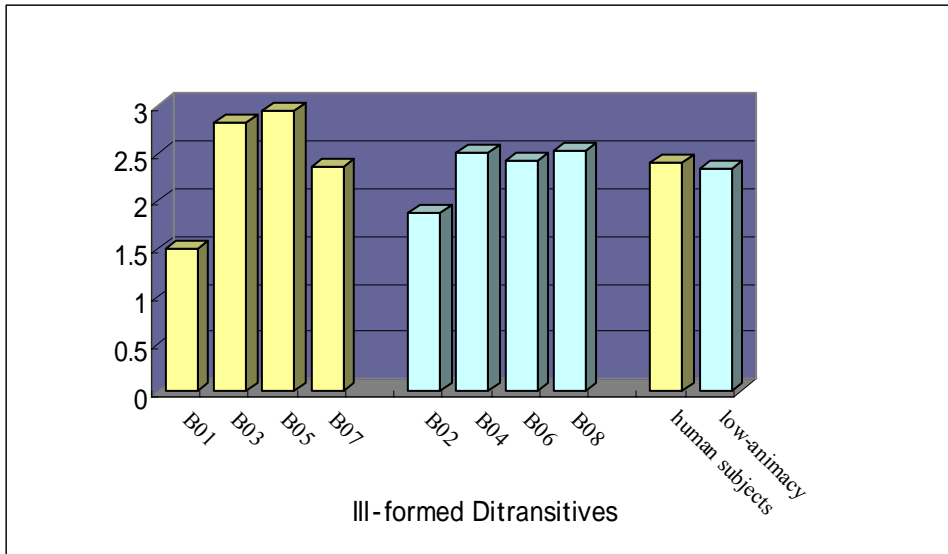
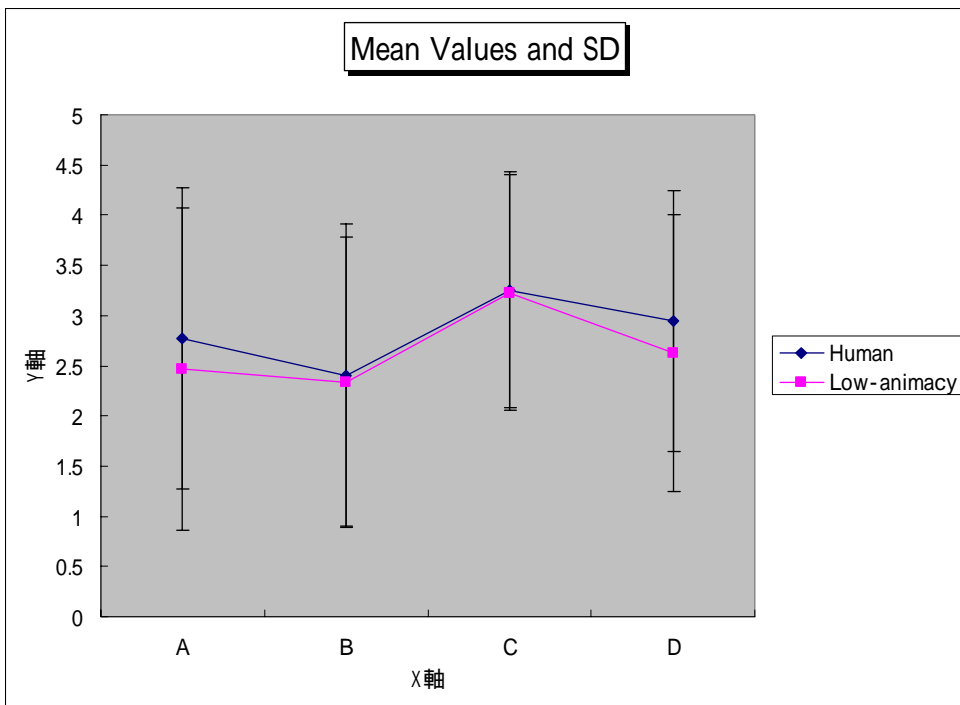


Fig. 3



	Human	Low-animacy		
A	2.775983	2.462079	1.497606	1.604183
B	2.405899	2.33427	1.505061	1.443937
C	3.255618	3.227528	1.175097	1.177286
D	2.945225	2.627809	1.300772	1.37867

Repeated Two-way ANOVA

	No. of Data	Mean	Unbiased Variance	SD	SEM
Human,A	1424	2.775983	2.242824	1.497606	0.039686
Human,B	1424	2.405899	2.265208	1.505061	0.039884
Human,C	1424	3.255618	1.380854	1.175097	0.03114
Human,D	1424	2.945225	1.692008	1.300772	0.03447
Low-animacy,A	1424	2.462079	2.573403	1.604183	0.042511
Low-animacy,B	1424	2.33427	2.084953	1.443937	0.038264
Low-animacy,C	1424	3.227528	1.386002	1.177286	0.031198
Low-animacy,D	1424	2.627809	1.90073	1.37867	0.036535
Human	5696	2.845681	1.988297	1.41007	0.018683
Low-animacy	5696	2.662921	2.102337	1.449944	0.019212
A	2848	2.619031	2.43191	1.559458	0.029222
B	2848	2.370084	2.175599	1.474991	0.027639
C	2848	3.241573	1.383139	1.176069	0.022038
D	2848	2.786517	1.820935	1.34942	0.025286
Total	11392	2.754301	2.053489	1.433	0.013426

Analysis of Variance

Source	SS	DF	MS	F	P	F(0.95)
Total	23391.29	11391				
Between	95.12649	1	95.12649	49.01538	2.68E-12	3.842276
Within	1151.71	3	383.9032	197.812	4.6E-125	2.605689
Interaction	50.982	3	16.994	8.75642	8.49E-06	2.605689
Me	22093.47	11384	1.940748			

Posthoc Test

Fisher's PLSD Level of significance: 5%

Human,Low-animacy	0.182759831	0.05116922	2.68252E-12	S
A,B	0.248946629	0.072364205	1.62249E-11	S
A,C	-0.622542135	0.072364205	4.87599E-63	S
A,D	-0.167485955	0.072364205	5.77008E-06	S
B,C	-0.871488764	0.072364205	2.4989E-120	S
B,D	-0.416432584	0.072364205	2.35351E-29	S
C,D	0.45505618	0.072364205	1.08677E-34	S

Sheffe's Level of significance: 5%

Human,Low-animacy	0.182759831	0.05116922	2.68252E-12	S
A,B	0.248946629	0.103217056	7.666E-10	S
A,C	-0.622542135	0.103217056	1.36237E-60	S
A,D	-0.167485955	0.103217056	0.000129619	S
B,C	-0.871488764	0.103217056	1.3325E-117	S
B,D	-0.416432584	0.103217056	3.008E-27	S
C,D	0.45505618	0.103217056	1.65093E-32	S

Bonferroni/Dunn Level of significance: 5%

Human,Low-animacy	0.182759831	0.05116922	2.68252E-12	S
A,B	0.248946629	0.097414276	0.040561926	S
A,C	-0.622542135	0.097414276	0.000780657	S
A,D	-0.167485955	0.097414276	0.068990711	S
B,C	-0.871488764	0.097414276	1.32329E-05	S
B,D	-0.416432584	0.097414276	0.009436986	S
C,D	0.45505618	0.097414276	0.00627864	S

### 4.3 Iconicity Effects

Iconicity Effects illustrate how thematic roles correspond to the word order of a sentence so that the sentence help a reader to have a vivid image particularly of the movement of its theme from the agent to the recipient or goal among spatial verbs. The following sentences and argument structure

illustrates the point.

C-to: Mr Jones gave some money to me. Give<agent, theme, goal/recipient>

D-to: Mr Jones reported the accident to me. Report<agent, theme, goal>

In comparison to to-datives, for-datives do not reveal such an strong iconicity, since for-dative verbs do not belong to the movement verbs, but they contain theme-recipient relationships.

C-for: John found a new dress for me. Find<agent, theme, recipient>

On the other hand, A-to and A-for do not possess this iconic property.

A-to: Mr Jones gave me some money. Give<agent, goal, theme>

A-for: John found me a new dress. Find<agent, recipient, theme>

Likewise, we can say that D-for do not possess the iconic property.

D-for: King Arthur fought the monster for the queen. Fight<agent, patient, beneficiary>

The difference among A-to, C-to, D-to, A-for, C-for, and D-for is whether the sentence contains recipients or beneficiaries. Furthermore, it depends on how likely the possession of the theme or the benefit is intended by the speaker of a sentence.

A-to: John gave me a book.

→ It is maximally likely that I owns the book

C-to: John gave a book to me (goal/recipient).

→ if it is certain that I possess a book as a result of the speech event, we can say John gave me a book. The sentence does not necessarily imply that I received the book from John.

D-to: iconic but inherently not to do with possession

A-for: recipient may be a possessor of the theme, but definitely the receiver of the benefit

C-for: John found a new dress for me (recipient).

→ It is possible but not necessary that I possess a new dress.

If the recipient is an intended possessor or the receiver of the benefit, we can say John found me a new dress.

D-for: King Arthur fought the monster for the queen (beneficiary).

→ The queen does not possess the monster

For this reason, we cannot say that King Arthur fought the queen the monster (B05).

In order to examine the iconicity effects, we need to compare the acceptance rate of A-to, C-to, D-to, A-for, C-for, and D-for. Post-hoc test yielded the following results. Out of 15 paired items, except for A-to & C-to, A-to & C-for and C-to & C-for, all showed statistical significance differences. This result suggests that acceptance data is influenced by the iconicity effects.



Fig. 4 Prepositional Datives

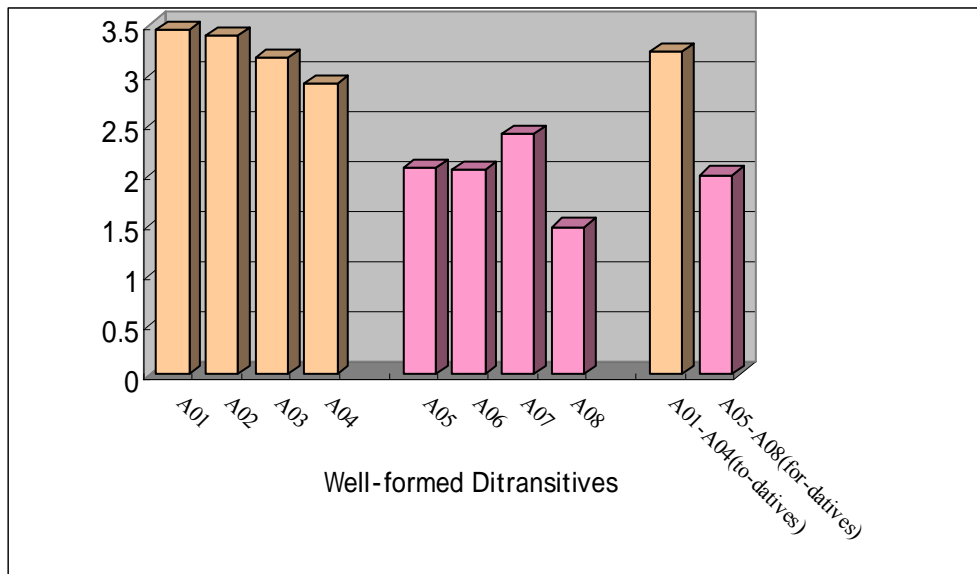


Fig. 5 Well-formed Dditransitives

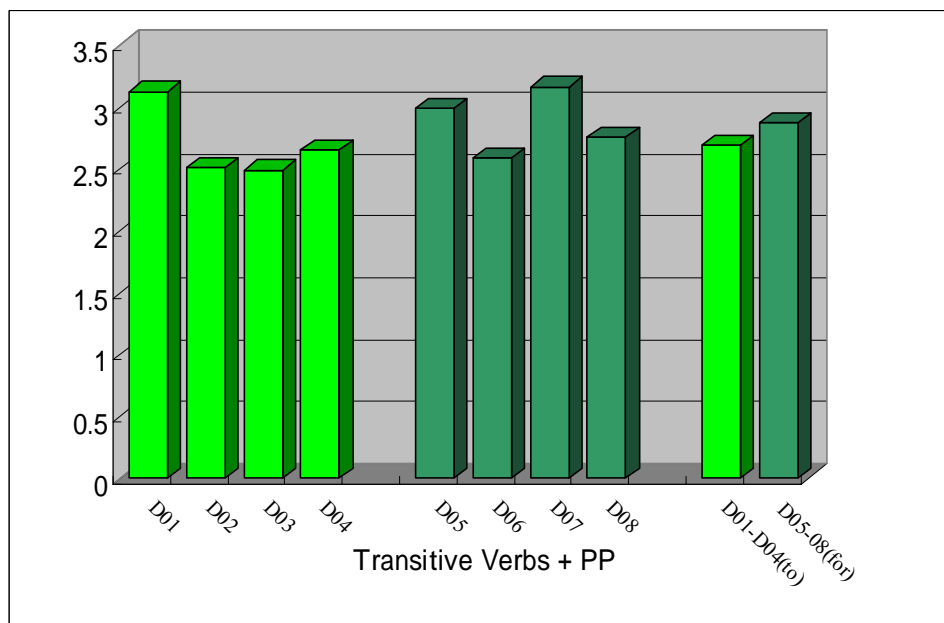


Fig. 6 Transitive Verbs +Prepositional Phrases

#### 4.4 Well-formed passives vs ill-formed passives

Fig 7 indicates that the passive forms of the human subject to-datives were accepted more than those of the for-datives. But even in E-to passives, the participants rated 0 (2.6 points on average stands for 0.6 in the actual scale) which stands for ‘uncertain’. In the case of the passive forms of for-dative, average score turned out to be 1.52 . This means -1.52 in the actual scale and it stands for between ‘completely ungrammatical’ and ‘fairly ungrammatical.’ In Japanese, passives with the human subjects are canonically adversative. For this reason, beneficiary sentences semantically conflicts with adversative sentences in Japanese. This semantic conflict may be the reason why the majority of the participants made mistakes in judging the sentences. [-r] of the double object to-dative is learned better than [-r] in the double object for-datives.

Fig 8 indicates the situation which is contrary to that in Fig 7. In Fig 8, the theme passives of the to-datives yielded 1.65 score on average, while those of the for-datives yielded 2.75. This means that the ungrammaticality of for-dative passives were judged more correctly than that of to-dative passives. [+o] of the double object for-datives is acquired better than that of the double object to-datives.

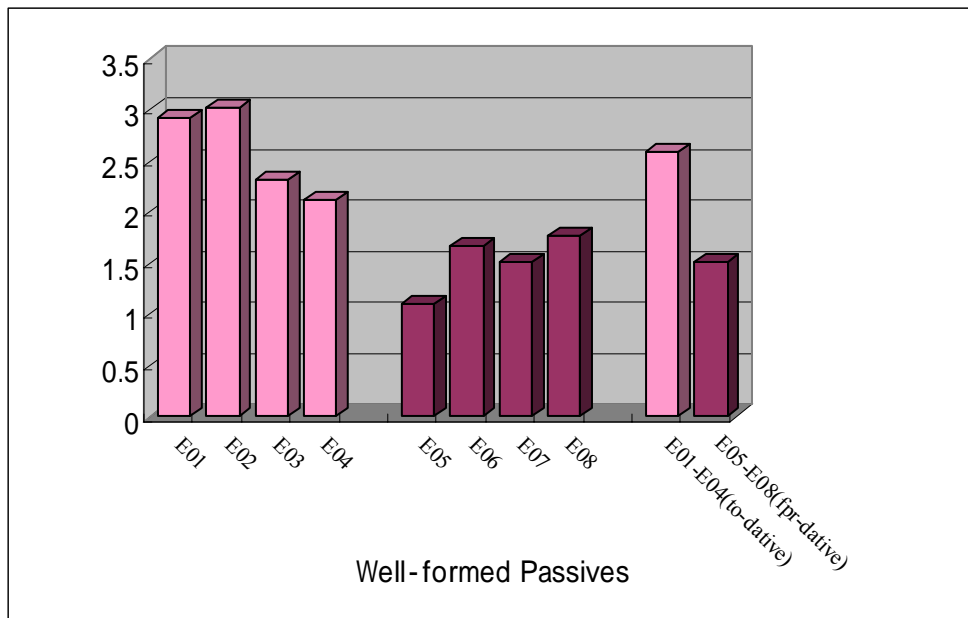


Fig. 7 Well-formed passives (human subjects)

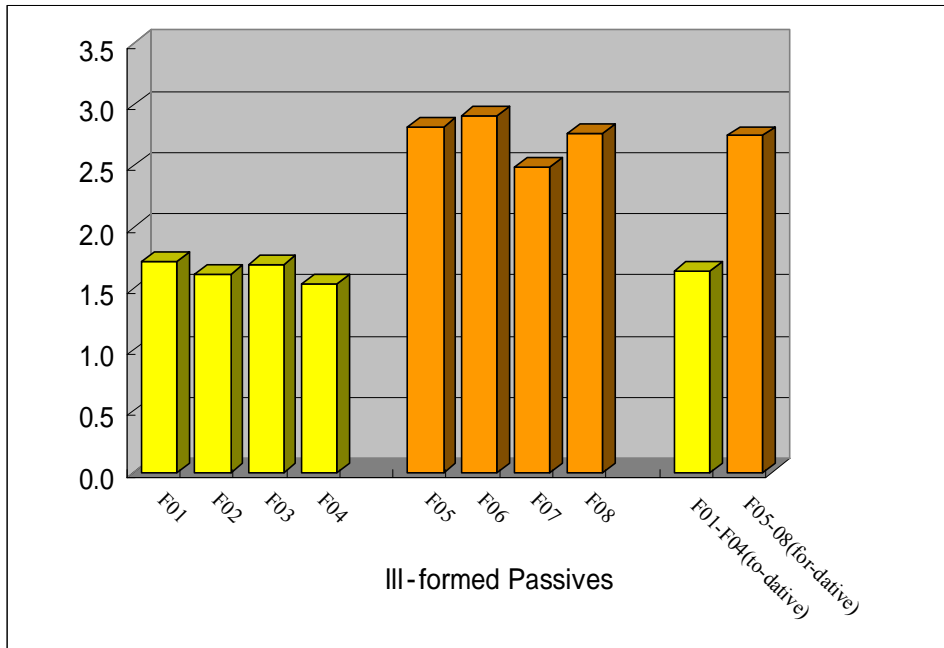
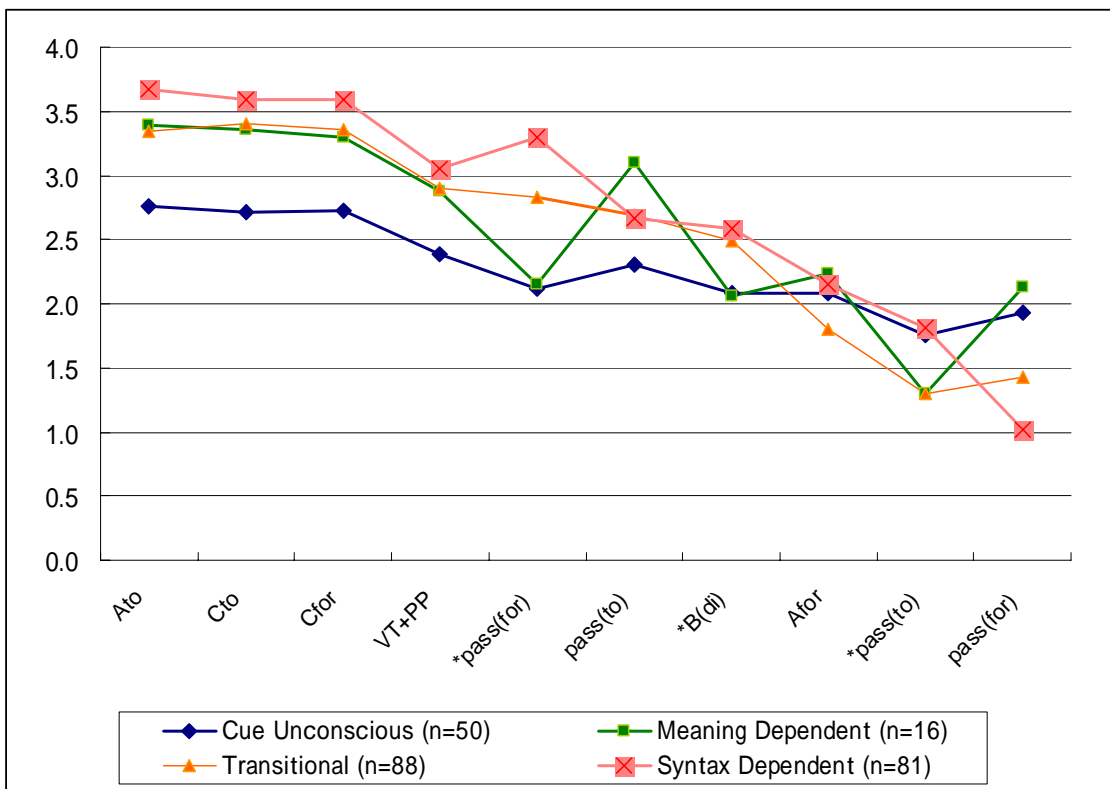


Fig. 8 Ill-formed Passives (theme subjects)

### 5.0 Judgement strategies derived from levels of Grammatical Knowledge and Grammatical Judgements



N TEST	C-to	C-for	A-to	pass(to)	A- for	pass(for)	*pass(for)	*B(di)	*Pass(to)
Cue									
Unconscious	2.715	2.730	2.755	2.305	2.085	1.925	2.115	2.088	1.755
Meaning									
Dependent	3.359	3.297	3.391	3.094	2.234	2.125	2.156	2.055	1.297
Transitional	3.403	3.361	3.341	2.688	1.795	1.423	2.830	2.487	1.304
Syntax									
Dependent	3.596	3.596	3.676	2.667	2.154	1.012	3.302	2.588	1.809
All Participants	3.320	3.303	3.335	2.627	2.011	1.436	2.795	2.407	1.573

In this section, we examine the relationship between learner strategies and grammatical judgement tests. We have defined four strategy groups in terms of MEG scores:

Cue unconscious participants: below 49 points

Meaning dependent participants: between 50 -59 points

Transitional participants: between 60 – 79 points

Syntax dependent participants: more than 80 points

We can characterise these as learner judgement strategies, since cue unconscious participants are those whose grammatical judgements are ‘uncertain’ and more or less at random; meaning dependents are those whose grammatical judgements rely on argument structure in LFG; syntax dependents are those who can map from argument structures to grammatical functions; that is, they can possess Lexical mapping abilities. Transitional participants are between meaning dependents and syntax dependents.

As the following figure indicates, cue unconscious judgements are clustered in the range of 2.7 and 1.8. This means that their actual ratings are in the range of 0.7 and 0.2. Recall that 0 in our original scale stands for ‘uncertain.’ Judgements made by meaning dependents are clustered in the range of 3.4 and 1.3. Transitional groups range between 3.4 and 1.3. Syntax dependents range over 3.7 and 1.0. This suggests that the present data do not support the idea of a transitional group in this respect. Furthermore, the three kinds of post-hoc test reveals that meaning dependent and transitional groups do not show statistically significant difference with the transitional group (see page 34). Sheffer’s and Bonferroni/Dunn’s post-hoc tests indicates that meaning dependents and syntax-oriented group do not show statistically significant differences. This point is going to be studied further in the future, but we can at least emphasize the two issues. According to LFS, knowledge of argument structure (a-structure), constituent structure (C-structure) generates well-formed functional structure (f-structure); that is, there are two routes to arrive at the functional

structure.

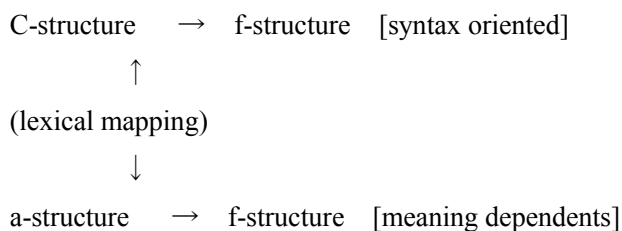


Fig. 9 Lexical Functional Syntax and Learner Judgement Strategies

LFS assumes that mentally we compute simultaneously to reach at the uniquely determined values in f-structure. The simultaneous computation imply that even syntax oriented subjects must apply the computation of a-f path. To give a simplified account of LFS, the above figure does not include reverse mapping but in LFS theory we adopt bi-jection. The simultaneous computation claims that we compute major two routes simultaneously, rejecting the ill-formed values during the computational process. So, assuming the LFS assumption of brain mechanism being the simultaneous computation, even syntax-oriented participants must be passing through the meaning dependent route. For this reason, we can accept and agree with the post hoc test results; i.e., meaning dependents and syntax-oriented group do not show statistically significant differences. Also, we should recognize that learner's acceptance of ill-formed sentences is the result of mentally generated wrong values.

A-to, C-to and C-for do not show statistically significant differences with respect to each of the four learner strategies, according to Fisher's PLSD, Sheffe's and Bonferroni/Dunn's post hoc test. As Fig. 10 indicates, the majority of syntax oriented subjects responded correctly for A-to, C-to and C-for. The amount of acceptance is different in the four groups, since as Corder(1973) explains, the same input does not ensure the extent of intake. Syntax-oriented participants are those whose MEG scores are the highest. As we stated above, we defined the four groups in terms of MEG scores. Syntax-oriented participants are able to digest Input into Intake best, and the degree of learning is, as we defined, in the order of transitional, meaning dependent, and cue unconscious groups.

Compare Fig 10 with Fig 11. In Fig 10, the acceptance of well-formed and ill-formed is mixed. In Fig.11, meaning dependents clearly differentiates well-formed sentences from ill-formed ones. This may indicates that lexical mapping is crucial in grammatical judgements, as suggested in Fig. 9 Lexical Functional Syntax and Learner Judgement Strategies

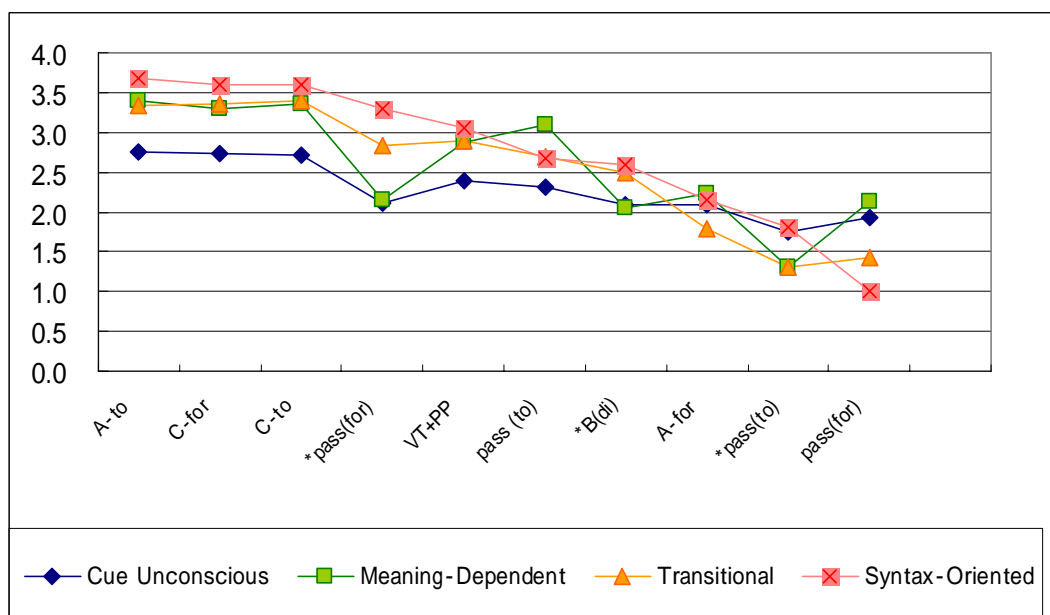


Fig. 10 Graph arranged with respect to Syntax-oriented group scores

Syntax-oriented participants correctly judged \*passives (for) as unacceptable, while meaning dependents judged as ‘uncertain’ just like cue unconscious participants. Meaning dependents’ uncertainty is repeated for ill-formed double object constructions (\*B(di)), well-formed double object for-datives (A-for) and well-formed for-dative passives (pass(for)). A-for is unfamiliar item which is not taught in the high school textbooks; for this reason judgements in all groups are clustered in ‘uncertainty’ range.

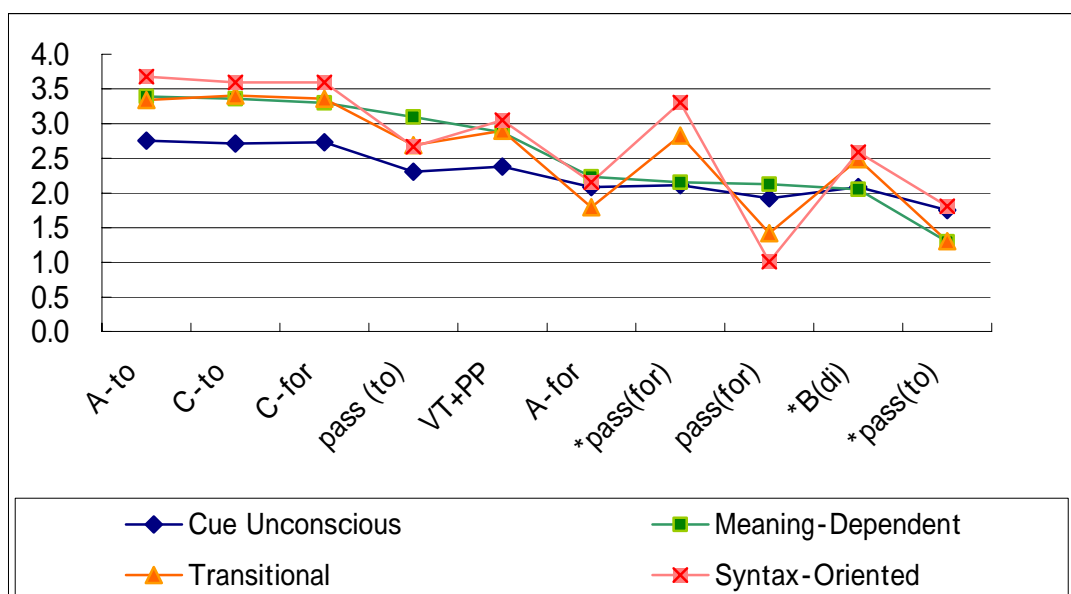


Fig. 11 Graph arranged w. r. t. Meaning dependents

The evidence that judgements by meaning dependents tend to rely on meanings derived from argument structures rather than syntactic movement come from four sources of passive constructions: pass (to), \*pass(to), pass (for) and \*pass (for).

	Mean scores	Mean actual rating	
pass (to)	3.1	+1.1	(fairly acceptable)
*pass(to)	1.3	+1.3	(fairly acceptable)
pass (for)	2.1	0.1	(uncertain)
*pass (for)	2.2	0.2	(uncertain)

The above table shows that meaning dependents do not differentiate pass(to) from \*pass(to), nor pass(for) from \*pass (for), since argument structures for pass(to) and \*pass(to) are identical and argument structures for pass(for) and \*pass (for) are also identical. Meaning dependents who rely on argument structure would respond in the same way for pass(to) and \*pass(to) as well as pass(for) and \*pass (for).

On the other hand, syntax-oriented subjects reacted differently from meaning dependents.

	Mean scores	Mean actual rating	
pass (to)	2.7	0.7	( closer to fairly acceptable)
*pass(to)	1.8	1.8	(closer to acceptable)
pass (for)	1.0	-1.0	(fairly unacceptable)
*pass (for)	3.3	-1.3	(fairly unacceptable)

They responded fairly well, except for pass (for) and \*pass(to). As stated in Section 3.4, misjudgements made by syntax-oriented subjects relates to their syntactic knowledge of Japanese adversative passives with human subjects, which could conjure up some semantic conflicts in those learner's mind.

Finally, since we have already seen that A-to, C-to, and C-for come to be accepted by the time they are university students, we will consider VT +PP, Passives (to) and Passives (for), A-for are learned in what order. As Figs 12 and 13 indicate, VT+PP is accepted more than Passives (to) is, followed by A-for and then Pass (for).

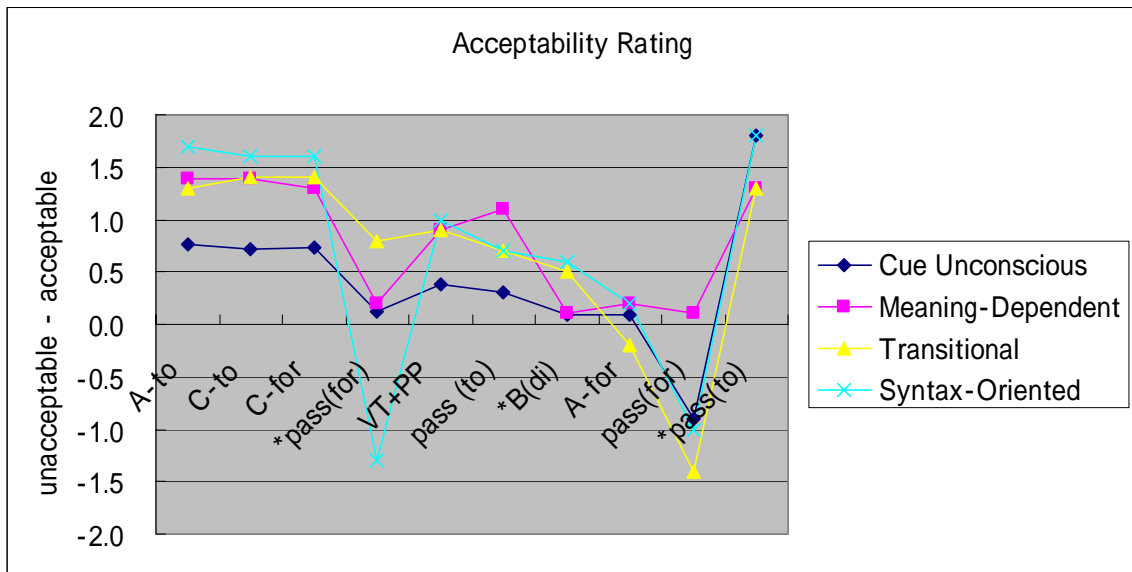


Fig. 12 Acceptability Judgements w. r. t. Syntax-oriented Group

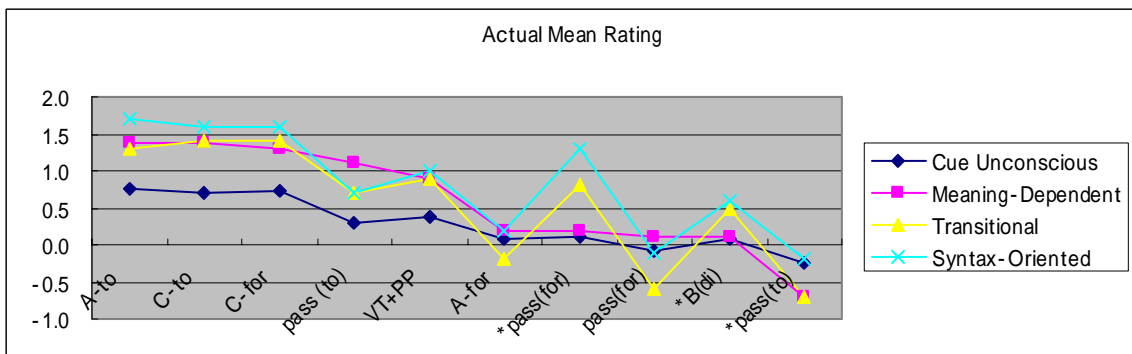


Fig. 13 Acceptability Judgements w. r. t. Syntax-oriented Group

Syntax-oriented group

A-to, C-to, C-for, VT+PP, pass(to)

[-o], [-o], [-o], [-o] [-r]

## 5.0 Conclusion

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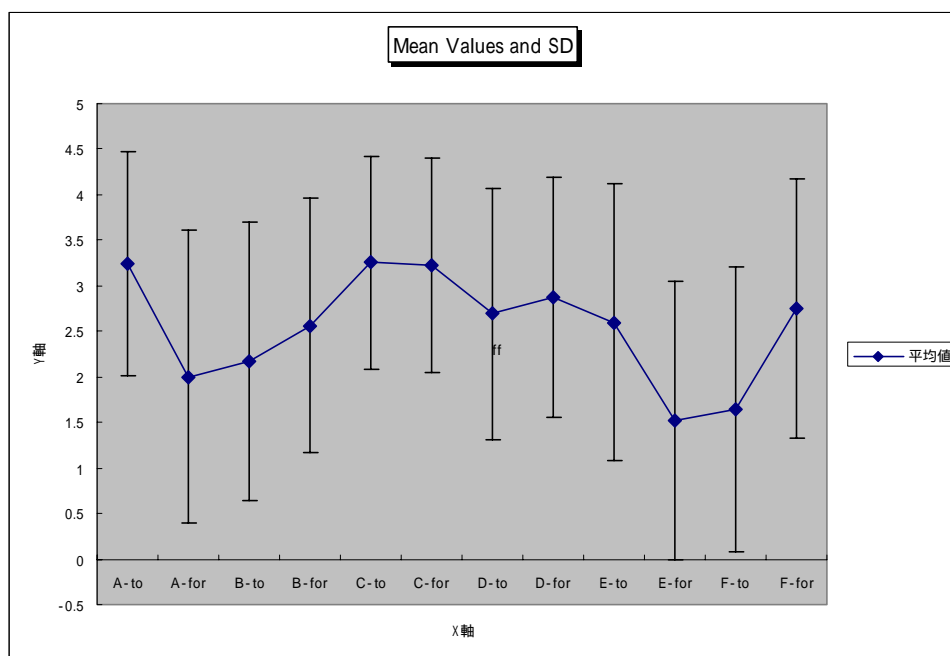
#### Appendix 1

- A01 Mr. Jones gave me some money.  
A02 The company gave him a new job.  
A03 My wife sent me three golf clubs.  
A04 The family sent him ten apples.  
A05 John found me a new dress.  
A06 The company found him a new office.  
A07 Simon made us a new dinner table.  
A08 The company made the secretary a new uniform.
- B01 \*Mr. Jones reported me the accident.  
B02 \*The police reported Bill the fire.  
B03 \*My wife moved me three golf clubs.  
B04 \*The family moved him a box of apples.



- F04 \*Ten apples were sent him by the family.
- F05 \*The new dress was found me by John.
- F06 \*The new office was found him by the company.
- F07 \*The new dinner table was made us by Simon.
- F08 \*The new house was made them by the company.

Appendix 2



One-way ANOVA

	No of Data	Mean	Unbiased	SD	SE
A-to	1424	3.2366573	1.511768	1.22954	0.032583
A-for	1424	2.0014045	2.5903	1.609441	0.04265
B-to	1424	2.1769663	2.332681	1.527312	0.040474
B-for	1424	2.5632022	1.945405	1.394778	0.036962
C-to	1424	3.2570225	1.366079	1.168794	0.030973
C-for	1424	3.2261236	1.400694	1.183509	0.031363
D-to	1424	2.695927	1.898339	1.377802	0.036512

D-for	1424	2.8771067	1.728386	1.314681	0.034839
E-to	1424	2.5983146	2.298128	1.515958	0.040173
E-for	1424	1.5154494	2.341293	1.530128	0.040548
F-to	1424	1.6481742	2.433405	1.559937	0.041338
F-for	1424	2.7492978	2.015108	1.419545	0.037618
Total	17088	2.5454705	2.314079	1.52121	0.011637

ANOVA

Source	SS	DF	MSR	F	P	F(0.95)
Total	39540.669	17087				
Between	5585.6308	11	507.7846	255.365	0	1.789208
Within	33955.039	17076	1.988466			

Fisher's PLSD Level of significance: 5%

	Difference of Means	Critical value	P	
A-to,A-for	1.235252809	0.103585	5.7E-119	S
A-to,B-to	1.059691011	0.103585	2.01E-88	S
A-to,B-for	0.673455056	0.103585	5E-37	S
A-to,C-to	-0.020365169	0.103585	0.699974	
A-to,C-for	0.010533708	0.103585	0.842011	
A-to,D-to	0.540730337	0.103585	1.68E-24	S
A-to,D-for	0.359550562	0.103585	1.05E-11	S
A-to,E-to	0.638342697	0.103585	1.86E-33	S
A-to,E-for	1.721207865	0.103585	8.4E-226	S
A-to,F-to	1.588483146	0.103585	1.8E-193	S
A-to,F-for	0.487359551	0.103585	3.25E-20	S
A-for,B-to	-0.175561798	0.103585	0.000895	S
A-for,B-for	-0.561797753	0.103585	2.59E-26	S
A-for,C-to	-1.255617978	0.103585	8.5E-123	S
A-for,C-for	-1.224719101	0.103585	5.2E-117	S
A-for,D-to	-0.694522472	0.103585	2.93E-39	S
A-for,D-for	-0.875702247	0.103585	3.42E-61	S
A-for,E-to	-0.596910112	0.103585	1.77E-29	S

A-for,E-for	0.485955056	0.103585	4.15E-20	S
A-for,F-to	0.353230337	0.103585	2.4E-11	S
A-for,F-for	-0.747893258	0.103585	3.27E-45	S
B-to,B-for	-0.386235955	0.103585	2.82E-13	S
B-to,C-to	-1.08005618	0.103585	9.7E-92	S
B-to,C-for	-1.049157303	0.103585	9.9E-87	S
B-to,D-to	-0.518960674	0.103585	1.06E-22	S
B-to,D-for	-0.700140449	0.103585	7.24E-40	S
B-to,E-to	-0.421348315	0.103585	1.65E-15	S
B-to,E-for	0.661516854	0.103585	8.59E-36	S
B-to,F-to	0.528792135	0.103585	1.66E-23	S
B-to,F-for	-0.572331461	0.103585	3.04E-27	S
B-for,C-to	-0.693820225	0.103585	3.48E-39	S
B-for,C-for	-0.662921348	0.103585	6.16E-36	S
B-for,D-to	-0.132724719	0.103585	0.012031	S
B-for,D-for	-0.313904494	0.103585	2.91E-09	S
B-for,E-to	-0.03511236	0.103585	0.506432	
B-for,E-for	1.047752809	0.103585	1.66E-86	S
B-for,F-to	0.91502809	0.103585	1.35E-66	S
B-for,F-for	-0.186095506	0.103585	0.00043	S
C-to,C-for	0.030898876	0.103585	0.558766	
C-to,D-to	0.561095506	0.103585	2.99E-26	S
C-to,D-for	0.37991573	0.103585	6.8E-13	S
C-to,E-to	0.658707865	0.103585	1.66E-35	S
C-to,E-for	1.741573034	0.103585	5.8E-231	S
C-to,F-to	1.608848315	0.103585	2.8E-198	S
C-to,F-for	0.507724719	0.103585	8.44E-22	S
C-for,D-to	0.530196629	0.103585	1.27E-23	S
C-for,D-for	0.349016854	0.103585	4.11E-11	S
C-for,E-to	0.627808989	0.103585	2.02E-32	S
C-for,E-for	1.710674157	0.103585	3.8E-223	S
C-for,F-to	1.577949438	0.103585	5.3E-191	S
C-for,F-for	0.476825843	0.103585	2.02E-19	S
D-to,D-for	-0.181179775	0.103585	0.000609	S
D-to,E-to	0.09761236	0.103585	0.064753	
D-to,E-for	1.180477528	0.103585	5.8E-109	S

D-to,F-to	1.047752809	0.103585	1.66E-86	S
D-to,F-for	-0.053370787	0.103585	0.312551	
D-for,E-to	0.278792135	0.103585	1.34E-07	S
D-for,E-for	1.361657303	0.103585	1.2E-143	S
D-for,F-to	1.228932584	0.103585	8.6E-118	S
D-for,F-for	0.127808989	0.103585	0.015596	S
E-to,E-for	1.082865169	0.103585	3.35E-92	S
E-to,F-to	0.9501404	0.11074	5.37E-62	S
E-to,F-for	-0.150983	0.11074	0.007544	S
E-for,F-to	-0.132725	0.11074	0.018829	S
E-for,F-for	-1.233848	0.11074	1.2E-101	S
F-to,F-for	-1.101124	0.11074	5.66E-82	S

Sheffe's Level of significance: 5%

	Difference of means	Critical value	P	
A-to,A-for	1.235252809	0.234448	2.6E-108	S
A-to,B-to	1.059691011	0.234448	2.05E-78	S
A-to,B-for	0.673455056	0.234448	6.07E-29	S
A-to,C-to	-0.020365169	0.234448	1	
A-to,C-for	0.010533708	0.234448	1	
A-to,D-to	0.540730337	0.234448	2.39E-17	S
A-to,D-for	0.359550562	0.234448	2.93E-06	S
A-to,E-to	0.638342697	0.234448	1.34E-25	S
A-to,E-for	1.721207865	0.234448	9E-214	S
A-to,F-to	1.588483146	0.234448	9E-182	S
A-to,F-for	0.487359551	0.234448	1.68E-13	S
A-for,B-to	-0.175561798	0.234448	0.440285	
A-for,B-for	-0.561797753	0.234448	5.36E-19	S
A-for,C-to	-1.255617978	0.234448	4.5E-112	S
A-for,C-for	-1.224719101	0.234448	2.1E-106	S
A-for,D-to	-0.694522472	0.234448	4.81E-31	S
A-for,D-for	-0.875702247	0.234448	5.41E-52	S
A-for,E-to	-0.596910112	0.234448	6.6E-22	S
A-for,E-for	0.485955056	0.234448	2.09E-13	S
A-for,F-to	0.353230337	0.234448	5.64E-06	S
A-for,F-for	-0.747893258	0.234448	1.11E-36	S



B-to,B-for	-0.386235955	0.234448	1.55E-07	S
B-to,C-to	-1.08005618	0.234448	1.19E-81	S
B-to,C-for	-1.049157303	0.234448	9.14E-77	S
B-to,D-to	-0.518960674	0.234448	1.01E-15	S
B-to,D-for	-0.700140449	0.234448	1.29E-31	S
B-to,E-to	-0.421348315	0.234448	2.09E-09	S
B-to,E-for	0.661516854	0.234448	8.76E-28	S
B-to,F-to	0.528792135	0.234448	1.91E-16	S
B-to,F-for	-0.572331461	0.234448	7.54E-20	S
B-for,C-to	-0.693820225	0.234448	5.66E-31	S
B-for,C-for	-0.662921348	0.234448	6.42E-28	S
B-for,D-to	-0.132724719	0.234448	0.852035	
B-for,D-for	-0.313904494	0.234448	0.000225	S
B-for,E-to	-0.03511236	0.234448	0.999999	
B-for,E-for	1.047752809	0.234448	1.51E-76	S
B-for,F-to	0.91502809	0.234448	3.28E-57	S
B-for,F-for	-0.186095506	0.234448	0.334403	
C-to,C-for	0.030898876	0.234448	1	
C-to,D-to	0.561095506	0.234448	6.1E-19	S
C-to,D-for	0.37991573	0.234448	3.2E-07	S
C-to,E-to	0.658707865	0.234448	1.63E-27	S
C-to,E-for	1.741573034	0.234448	6.9E-219	S
C-to,F-to	1.608848315	0.234448	1.6E-186	S
C-to,F-for	0.507724719	0.234448	6.52E-15	S
C-for,D-to	0.530196629	0.234448	1.5E-16	S
C-for,D-for	0.349016854	0.234448	8.63E-06	S
C-for,E-to	0.627808989	0.234448	1.24E-24	S
C-for,E-for	1.710674157	0.234448	3.8E-211	S
C-for,F-to	1.577949438	0.234448	2.5E-179	S
C-for,F-for	0.476825843	0.234448	8.5E-13	S
D-to,D-for	-0.181179775	0.234448	0.382498	
D-to,E-to	0.09761236	0.234448	0.98408	
D-to,E-for	1.180477528	0.234448	1.67E-98	S
D-to,F-to	1.047752809	0.234448	1.51E-76	S
D-to,F-for	-0.053370787	0.234448	0.999944	
D-for,E-to	0.278792135	0.234448	0.003455	S

D-for,E-for	1.361657303	0.234448	1.3E-132	S
D-for,F-to	1.228932584	0.234448	3.7E-107	S
D-for,F-for	0.127808989	0.234448	0.88321	
E-to,E-for	1.082865169	0.234448	4.2E-82	S
E-to,F-to	0.95014	0.157961	1.46E-59	S
E-to,F-for	-0.15098	0.157961	0.067567	
E-for,F-to	-0.13272	0.157961	0.137548	
E-for,F-for	-1.23385	0.157961	5.5E-99	S
F-to,F-for	-1.10112	0.157961	2.03E-79	S

Bonferroni/Dunn Level of significance: 5%

	Difference of means	Critical value	P	
A-to,A-for	1.235253	0.178012	0.010926	S
A-to,B-to	1.059691	0.178012	0.011497	S
A-to,B-for	0.673455	0.178012	0.012773	S
A-to,C-to	-0.02037	0.178012	0.014684	
A-to,C-for	0.010534	0.178012	0.014695	
A-to,D-to	0.54073	0.178012	0.013212	S
A-to,D-for	0.359551	0.178012	0.013802	S
A-to,E-to	0.638343	0.178012	0.01289	S
A-to,E-for	1.721208	0.178012	0.009397	S
A-to,F-to	1.588483	0.178012	0.009806	S
A-to,F-for	0.48736	0.178012	0.013388	S
A-for,B-to	-0.17556	0.178012	0.014355	
A-for,B-for	-0.5618	0.178012	0.013143	S
A-for,C-to	-1.25562	0.178012	0.010861	S
A-for,C-for	-1.22472	0.178012	0.01096	S
A-for,D-to	-0.69452	0.178012	0.012703	S
A-for,D-for	-0.8757	0.178012	0.012103	S
A-for,E-to	-0.59691	0.178012	0.013027	S
A-for,E-for	0.485955	0.178012	0.013392	S
A-for,F-to	0.35323	0.178012	0.013822	S
A-for,F-for	-0.74789	0.178012	0.012526	S
B-to,B-for	-0.38624	0.178012	0.013716	S
B-to,C-to	-1.08006	0.178012	0.011431	S
B-to,C-for	-1.04916	0.178012	0.011532	S

B-to,D-to	-0.51896	0.178012	0.013284	S
B-to,D-for	-0.70014	0.178012	0.012685	S
B-to,E-to	-0.42135	0.178012	0.013603	S
B-to,E-for	0.661517	0.178012	0.012813	S
B-to,F-to	0.528792	0.178012	0.013252	S
B-to,F-for	-0.57233	0.178012	0.013108	S
B-for,C-to	-0.69382	0.178012	0.012706	S
B-for,C-for	-0.66292	0.178012	0.012808	S
B-for,D-to	-0.13272	0.178012	0.014466	
B-for,D-for	-0.3139	0.178012	0.013946	S
B-for,E-to	-0.03511	0.178012	0.014663	
B-for,E-for	1.047753	0.178012	0.011536	S
B-for,F-to	0.915028	0.178012	0.011973	S
B-for,F-for	-0.1861	0.178012	0.014326	S
C-to,C-for	0.030899	0.178012	0.014669	
C-to,D-to	0.561096	0.178012	0.013145	S
C-to,D-for	0.379916	0.178012	0.013737	S
C-to,E-to	0.658708	0.178012	0.012822	S
C-to,E-for	1.741573	0.178012	0.009335	S
C-to,F-to	1.608848	0.178012	0.009743	S
C-to,F-for	0.507725	0.178012	0.013321	S
C-for,D-to	0.530197	0.178012	0.013247	S
C-for,D-for	0.349017	0.178012	0.013835	S
C-for,E-to	0.627809	0.178012	0.012925	S
C-for,E-for	1.710674	0.178012	0.009429	S
C-for,F-to	1.577949	0.178012	0.009839	S
C-for,F-for	0.476826	0.178012	0.013422	S
D-to,D-for	-0.18118	0.178012	0.01434	S
D-to,E-to	0.097612	0.178012	0.014548	
D-to,E-for	1.180478	0.178012	0.011104	S
D-to,F-to	1.047753	0.178012	0.011536	S
D-to,F-for	-0.05337	0.178012	0.014634	
D-for,E-to	0.278792	0.178012	0.014054	S
D-for,E-for	1.361657	0.178012	0.010521	S
D-for,F-to	1.228933	0.178012	0.010947	S
D-for,F-for	0.127809	0.178012	0.014478	

E-to,E-for	1.082865	0.178012	0.011421	S
E-to,F-to	0.95014	0.149084	0.000799	S
E-to,F-for	-0.15098	0.149084	0.098449	S
E-for,F-to	-0.13272	0.149084	0.103728	
E-for,F-for	-1.23385	0.149084	4.32E-05	S
F-to,F-for	-1.10112	0.149084	0.000183	S

### Appendix 3

Sheffe's Level of Significance 5%

	Cue	Meaning	Transitional	Syntax	All
	unconscious	Dependent		Dependent	participants
	P 值	P 值	P 值	P 值	P 值
to datives,ditrans. (to)	1.000	1.000	1.000	1.000	1.000
to datives,for datives	1.000	1.000	1.000	1.000	1.000
to datives,passives (to)	0.723	0.999	0.000 **	0.000 **	0.000 **
to datives,ditrans. (for)	0.132	0.051	0.000 **	0.000 **	0.000 **
to datives,*ditrans.	0.136	0.009 **	0.000 **	0.000 **	0.000 **
to datives,*passives (for)	0.185	0.025 *	0.016 *	0.861	0.000 **
to datives,passives (for)	0.013 *	0.018 *	0.000 **	0.000 **	0.000 **
to datives,*passives (to)	0.000 **	0.000 **	0.000 **	0.000 **	0.000 **
ditrans. (to),for datives	1.000	1.000	1.000	1.000	1.000
ditrans. (to),passives (to)	0.603	0.997	0.002 **	0.000 **	0.000 **
ditrans. (to),ditrans. (for)	0.080	0.039 *	0.000 **	0.000 **	0.000 **
ditrans. (to),*ditrans.	0.083	0.006 **	0.000 **	0.000 **	0.000 **
ditrans. (to),*passives (for)	0.117	0.018 *	0.059	0.602	0.000 **
ditrans. (to),passives (for)	0.006 **	0.013 *	0.000 **	0.000 **	0.000 **
ditrans. (to),*passives (to)	0.000 **	0.000 **	0.000 **	0.000 **	0.000 **
for datives,passives (to)	0.679	1.000	0.001 **	0.000 **	0.000 **
for datives,ditrans. (for)	0.110	0.085	0.000 **	0.000 **	0.000 **
for datives,*ditrans.	0.114	0.017 *	0.000 **	0.000 **	0.000 **
for datives,*passives (for)	0.157	0.044 *	0.040 *	0.861	0.000 **
for datives,passives (for)	0.010 **	0.033 *	0.000 **	0.000 **	0.000 **
for datives,*passives (to)	0.000 **	0.000 **	0.000 **	0.000 **	0.000 **

passives (to),ditrans. (for)	0.992	0.323	0.000 **	0.151	0.000 **
passives (to),*ditrans.	0.993	0.102	0.970	1.000	0.606
passives (to),*passives (for)	0.997	0.207	0.997	0.018 *	0.879
passives (to),passives (for)	0.802	0.169	0.000 **	0.000 **	0.000 **
passives (to),*passives (to)	0.300	0.000 **	0.000 **	0.000 **	0.000 **
ditrans. (for),*ditrans.	1.000	1.000	0.001 **	0.376	0.008 **
ditrans. (for),*passives (for)	1.000	1.000	0.000 **	0.000 **	0.000 **
ditrans. (for),passives (for)	0.999	1.000	0.435	0.000 **	0.000 **
ditrans. (for),*passives (to)	0.903	0.207	0.085	0.704	0.001 **
*ditrans.,*passives (for)	1.000	1.000	0.562	0.003 **	0.011 *
*ditrans.,passives (for)	0.999	1.000	0.000 **	0.000 **	0.000 **
*ditrans.,*passives (to)	0.899	0.512	0.000 **	0.001 **	0.000 **
*passives (for),passives (for)	0.997	1.000	0.000 **	0.000 **	0.000 **
*passives (for),*passives (to)	0.847	0.323	0.000 **	0.000 **	0.000 **
passives (for),*passives (to)	0.999	0.378	0.999	0.000 **	0.962

p<.05=\* p<.01=\*\*

### Cue Unconscious

	平均値の差	棄却値	P値	
to datives,ditrans. (to)	-0.040	0.704	1.000	
to datives,for datives	-0.015	0.704	1.000	
to datives,passives (to)	0.410	0.704	0.723	
to datives,ditrans. (for)	0.630	0.704	0.132	
to datives,*ditrans.	0.628	0.704	0.136	
to datives,*passives (for)	0.600	0.704	0.185	
to datives,passives (for)	0.790	0.704	0.013	S
to datives,*passives (to)	0.960	0.704	0.000	S
ditrans. (to),for datives	0.025	0.704	1.000	
ditrans. (to),passives (to)	0.450	0.704	0.603	
ditrans. (to),ditrans. (for)	0.670	0.704	0.080	
ditrans. (to),*ditrans.	0.668	0.704	0.083	
ditrans. (to),*passives (for)	0.640	0.704	0.117	

ditrans. (to),passives (for)	0.830	0.704	0.006	S
ditrans. (to),*passives (to)	1.000	0.704	0.000	S
for datives,passives (to)	0.425	0.704	0.679	
for datives,ditrans. (for)	0.645	0.704	0.110	
for datives,*ditrans.	0.643	0.704	0.114	
for datives,*passives (for)	0.615	0.704	0.157	
for datives,passives (for)	0.805	0.704	0.010	S
for datives,*passives (to)	0.975	0.704	0.000	S
passives (to),ditrans. (for)	0.220	0.704	0.992	
passives (to),*ditrans.	0.218	0.704	0.993	
passives (to),*passives (for)	0.190	0.704	0.997	
passives (to),passives (for)	0.380	0.704	0.802	
passives (to),*passives (to)	0.550	0.704	0.300	
ditrans. (for),*ditrans.	-0.002	0.704	1.000	
ditrans. (for),*passives (for)	-0.030	0.704	1.000	
ditrans. (for),passives (for)	0.160	0.704	0.999	
ditrans. (for),*passives (to)	0.330	0.704	0.903	
*ditrans.,*passives (for)	-0.028	0.704	1.000	
*ditrans.,passives (for)	0.163	0.704	0.999	
*ditrans.,*passives (to)	0.333	0.704	0.899	
*passives (for),passives (for)	0.190	0.704	0.997	
*passives (for),*passives (to)	0.360	0.704	0.847	
passives (for),*passives (to)	0.170	0.704	0.999	

### Meaning Dependent

	平均値の差	棄却値	P 値	
to datives,ditrans. (to)	-0.031	1.127	1.000	
to datives,for datives	0.063	1.127	1.000	
to datives,passives (to)	0.266	1.127	0.999	
to datives,ditrans. (for)	1.125	1.127	0.051	
to datives,*ditrans.	1.305	1.127	0.009	S
to datives,*passives (for)	1.203	1.127	0.025	S

to datives,passives (for)	1.234	1.127	0.018	S
to datives,*passives (to)	2.063	1.127	0.000	S
ditrans. (to),for datives	0.094	1.127	1.000	
ditrans. (to),passives (to)	0.297	1.127	0.997	
ditrans. (to),ditrans. (for)	1.156	1.127	0.039	S
ditrans. (to),*ditrans.	1.336	1.127	0.006	S
ditrans. (to),*passives (for)	1.234	1.127	0.018	S
ditrans. (to),passives (for)	1.266	1.127	0.013	S
ditrans. (to),*passives (to)	2.094	1.127	0.000	S
for datives,passives (to)	0.203	1.127	1.000	
for datives,ditrans. (for)	1.063	1.127	0.085	
for datives,*ditrans.	1.242	1.127	0.017	S
for datives,*passives (for)	1.141	1.127	0.044	S
for datives,passives (for)	1.172	1.127	0.033	S
for datives,*passives (to)	2.000	1.127	0.000	S
passives (to),ditrans. (for)	0.859	1.127	0.323	
passives (to),*ditrans.	1.039	1.127	0.102	
passives (to),*passives (for)	0.938	1.127	0.207	
passives (to),passives (for)	0.969	1.127	0.169	
passives (to),*passives (to)	1.797	1.127	0.000	S
ditrans. (for),*ditrans.	0.180	1.127	1.000	
ditrans. (for),*passives (for)	0.078	1.127	1.000	
ditrans. (for),passives (for)	0.109	1.127	1.000	
ditrans. (for),*passives (to)	0.938	1.127	0.207	
*ditrans.,*passives (for)	-0.102	1.127	1.000	
*ditrans.,passives (for)	-0.070	1.127	1.000	
*ditrans.,*passives (to)	0.758	1.127	0.512	
*passives (for),passives (for)	0.031	1.127	1.000	
*passives (for),*passives (to)	0.859	1.127	0.323	
passives (for),*passives (to)	0.828	1.127	0.378	

Transitional

	平均値の差	棄却値	P値	
to datives,ditrans. (to)	0.063	0.520	1.000	
to datives,for datives	0.043	0.520	1.000	
to datives,passives (to)	0.716	0.520	0.000	S
to datives,ditrans. (for)	1.608	0.520	0.000	S
to datives,*ditrans.	0.916	0.520	0.000	S
to datives,*passives (for)	0.574	0.520	0.016	S
to datives,passives (for)	1.980	0.520	0.000	S
to datives,*passives (to)	2.099	0.520	0.000	S
ditrans. (to),for datives	-0.020	0.520	1.000	
ditrans. (to),passives (to)	0.653	0.520	0.002	S
ditrans. (to),ditrans. (for)	1.545	0.520	0.000	S
ditrans. (to),*ditrans.	0.854	0.520	0.000	S
ditrans. (to),*passives (for)	0.511	0.520	0.059	
ditrans. (to),passives (for)	1.918	0.520	0.000	S
ditrans. (to),*passives (to)	2.037	0.520	0.000	S
for datives,passives (to)	0.673	0.520	0.001	S
for datives,ditrans. (for)	1.565	0.520	0.000	S
for datives,*ditrans.	0.874	0.520	0.000	S
for datives,*passives (for)	0.531	0.520	0.040	S
for datives,passives (for)	1.938	0.520	0.000	S
for datives,*passives (to)	2.057	0.520	0.000	S
passives (to),ditrans. (for)	0.892	0.520	0.000	S
passives (to),*ditrans.	0.200	0.520	0.970	
passives (to),*passives (for)	-0.142	0.520	0.997	
passives (to),passives (for)	1.264	0.520	0.000	S
passives (to),*passives (to)	1.384	0.520	0.000	S
ditrans. (for),*ditrans.	-0.692	0.520	0.001	S
ditrans. (for),*passives (for)	-1.034	0.520	0.000	S
ditrans. (for),passives (for)	0.372	0.520	0.435	
ditrans. (for),*passives (to)	0.491	0.520	0.085	
*ditrans.,*passives (for)	-0.342	0.520	0.562	
*ditrans.,passives (for)	1.064	0.520	0.000	S
*ditrans.,*passives (to)	1.183	0.520	0.000	S
*passives (for),passives (for)	1.406	0.520	0.000	S



*passives (for),*passives (to)	1.526	0.520	0.000	S
passives (for),*passives (to)	0.119	0.520	0.999	

Syntax Dependent

	平均値の差	棄却値	P値	
to datives,ditrans. (to)	-0.080	0.583	1.000	
to datives,for datives	0.000	0.583	1.000	
to datives,passives (to)	0.929	0.583	0.000	S
to datives,ditrans. (for)	1.441	0.583	0.000	S
to datives,*ditrans.	1.008	0.583	0.000	S
to datives,*passives (for)	0.293	0.583	0.861	
to datives,passives (for)	2.583	0.583	0.000	S
to datives,*passives (to)	1.787	0.583	0.000	S
ditrans. (to),for datives	0.080	0.583	1.000	
ditrans. (to),passives (to)	1.009	0.583	0.000	S
ditrans. (to),ditrans. (for)	1.522	0.583	0.000	S
ditrans. (to),*ditrans.	1.088	0.583	0.000	S
ditrans. (to),*passives (for)	0.373	0.583	0.602	
ditrans. (to),passives (for)	2.664	0.583	0.000	S
ditrans. (to),*passives (to)	1.867	0.583	0.000	S
for datives,passives (to)	0.929	0.583	0.000	S
for datives,ditrans. (for)	1.441	0.583	0.000	S
for datives,*ditrans.	1.008	0.583	0.000	S
for datives,*passives (for)	0.293	0.583	0.861	
for datives,passives (for)	2.583	0.583	0.000	S
for datives,*passives (to)	1.787	0.583	0.000	S
passives (to),ditrans. (for)	0.512	0.583	0.151	
passives (to),*ditrans.	0.079	0.583	1.000	
passives (to),*passives (for)	-0.636	0.583	0.018	S
passives (to),passives (for)	1.654	0.583	0.000	S
passives (to),*passives (to)	0.858	0.583	0.000	S
ditrans. (for),*ditrans.	-0.434	0.583	0.376	
ditrans. (for),*passives (for)	-1.148	0.583	0.000	S

ditrans. (for),passives (for)	1.142	0.583	0.000	S
ditrans. (for),*passives (to)	0.346	0.583	0.704	
*ditrans.,*passives (for)	-0.715	0.583	0.003	S
*ditrans.,passives (for)	1.576	0.583	0.000	S
*ditrans.,*passives (to)	0.779	0.583	0.001	S
*passives (for),passives (for)	2.290	0.583	0.000	S
*passives (for),*passives (to)	1.494	0.583	0.000	S
passives (for),*passives (to)	-0.796	0.583	0.000	S

ALL

	平均値の差	棄却値	P値	
to datives,ditrans. (to)	-0.015	0.342	1.000	
to datives,for datives	0.017	0.342	1.000	
to datives,passives (to)	0.694	0.342	0.000	S
to datives,ditrans. (for)	1.310	0.342	0.000	S
to datives,*ditrans.	0.913	0.342	0.000	S
to datives,*passives (for)	0.526	0.342	0.000	S
to datives,passives (for)	1.884	0.342	0.000	S
to datives,*passives (to)	1.747	0.342	0.000	S
ditrans. (to),for datives	0.032	0.342	1.000	
ditrans. (to),passives (to)	0.709	0.342	0.000	S
ditrans. (to),ditrans. (for)	1.324	0.342	0.000	S
ditrans. (to),*ditrans.	0.928	0.342	0.000	S
ditrans. (to),*passives (for)	0.540	0.342	0.000	S
ditrans. (to),passives (for)	1.899	0.342	0.000	S
ditrans. (to),*passives (to)	1.762	0.342	0.000	S
for datives,passives (to)	0.677	0.342	0.000	S
for datives,ditrans. (for)	1.293	0.342	0.000	S
for datives,*ditrans.	0.896	0.342	0.000	S
for datives,*passives (for)	0.509	0.342	0.000	S
for datives,passives (for)	1.867	0.342	0.000	S
for datives,*passives (to)	1.730	0.342	0.000	S
passives (to),ditrans. (for)	0.616	0.342	0.000	S
passives (to),*ditrans.	0.219	0.342	0.606	
passives (to),*passives (for)	-0.168	0.342	0.879	

passives (to),passives (for)	1.190	0.342	0.000	S
passives (to),*passives (to)	1.053	0.342	0.000	S
ditrans. (for),*ditrans.	-0.397	0.342	0.008	S
ditrans. (for),*passives (for)	-0.784	0.342	0.000	S
ditrans. (for),passives (for)	0.574	0.342	0.000	S
ditrans. (for),*passives (to)	0.437	0.342	0.001	S
*ditrans.,*passives (for)	-0.387	0.342	0.011	S
*ditrans.,passives (for)	0.971	0.342	0.000	S
*ditrans.,*passives (to)	0.834	0.342	0.000	S
*passives (for),passives (for)	1.359	0.342	0.000	S
*passives (for),*passives (to)	1.221	0.342	0.000	S
passives (for),*passives (to)	-0.137	0.342	0.962	

## Appendix 4

### Two way ANOVA (Repeated Measures)

Source	SS	Df	Mean Square	F	P	F(0.95)
Total	3025.92	2349				
Between	65.44555	3	21.81518392	28.45409229	4.60177E-18	2.608755142
Within	1040.87	9	115.6521897	150.8480557	1.7956E-224	1.883925583
Interactions	148.5735	27	5.502721463	7.17733781	6.92929E-26	1.490535437
Se	1771.031	2310	0.766680015			

### Basic Statistics

	No. of Data	Mean	Unbiased Variance	SD	SEM
Cue Unconscious,Cto	50	2.715	0.918392857	0.958328157	0.135528068
Cue Unconscious,Ato	50	2.755	0.677270408	0.822964403	0.116384742
Cue Unconscious,Cfor	50	2.73	0.744489796	0.862838221	0.122023751
Cue Unconscious,passives (to)	50	2.305	0.83747449	0.915136323	0.12941982
Cue Unconscious,Afor	50	2.085	0.927576531	0.963107746	0.136204004
Cue Unconscious,*B(di)	50	2.0875	0.263552296	0.513373447	0.072601969
Cue Unconscious,*passives(for)	50	2.115	1.28369898	1.133004404	0.160231019
Cue Unconscious,passives(for)	50	1.925	0.758290816	0.870798953	0.123149569
Cue Unconscious,*passives(to)	50	1.755	0.705331633	0.839840242	0.118771346
Cue Unconscious,VT+PP	50	2.3825	0.381001276	0.617253008	0.087292757
Meaning Dependent,Cto	16	3.359375	0.358072917	0.598391942	0.149597986
Meaning Dependent,Ato	16	3.390625	0.224739583	0.474067066	0.118516767
Meaning Dependent,Cfor	16	3.296875	0.56015625	0.748435869	0.187108967
Meaning Dependent,passives (to)	16	3.09375	0.623958333	0.789910332	0.197477583
Meaning Dependent,Afor	16	2.234375	0.75390625	0.868277749	0.217069437
Meaning Dependent,*B(di)	16	2.0546875	0.414518229	0.643830901	0.160957725
Meaning Dependent,*passives(for)	16	2.15625	0.865625	0.930389703	0.232597426
Meaning Dependent,passives(for)	16	2.125	0.566666667	0.752772653	0.188193163

Meaning Dependent,*passives(to)	16	1.296875	1.326822917	1.151877996	0.287969499
Meaning Dependent,VT+PP	16	2.875	0.360416667	0.600347122	0.15008678
Transitional,Cto	88	3.403409091	0.365562957	0.604618026	0.064452498
Transitional,Ato	88	3.340909091	0.563479624	0.750652798	0.080019857
Transitional,Cfor	88	3.360795455	0.515600509	0.718053278	0.076544737
Transitional,passives (to)	88	2.6875	0.871048851	0.933299979	0.099490112
Transitional,Afor	88	1.795454545	1.141588297	1.068451354	0.113897297
Transitional,*B(di)	88	2.487215909	0.403390723	0.635130477	0.067705136
Transitional,*passives(for)	88	2.829545455	0.864289446	0.929671687	0.099103335
Transitional,passives(for)	88	1.423295455	0.999077521	0.999538654	0.106551179
Transitional,*passives(to)	88	1.303977273	1.134265609	1.065019065	0.113531414
Transitional,VT+PP	88	2.897727273	0.494448798	0.703170533	0.074958231
Syntax-oriented,Cto	81	3.595679012	0.429012346	0.65499034	0.072776704
Syntax-oriented,Ato	81	3.675925926	0.200694444	0.447989335	0.049776593
Syntax-oriented,Cfor	81	3.595679012	0.383699846	0.619435102	0.068826122
Syntax-oriented,passives (to)	81	2.666666667	1.2140625	1.101845044	0.122427227
Syntax-oriented,Afor	81	2.154320988	1.544637346	1.2428344	0.138092711
Syntax-oriented,*B(di)	81	2.587962963	0.536111111	0.732196088	0.081355121
Syntax-oriented,*passives(for)	81	3.302469136	0.701118827	0.837328387	0.093036487
Syntax-oriented,passives(for)	81	1.012345679	0.915470679	0.95680232	0.106311369
Syntax-oriented,*passives(to)	81	1.808641975	2.014486883	1.419326207	0.157702912
Syntax-oriented,VT+PP	81	3.047839506	0.475221836	0.689363356	0.076595928
Cue Unconscious	500	2.2855	0.849626503	0.921751866	0.041221997
Meaning Dependent	160	2.58828125	1.029794983	1.014788147	0.080226047
Transitional	880	2.552982955	1.290829402	1.136146735	0.038299499
Syntax-oriented	810	2.744753086	1.530449877	1.237113526	0.043467739
Cto	235	3.320212766	0.605091835	0.777876491	0.050743067
Ato	235	3.335106383	0.546678942	0.739377401	0.048231664
Cfor	235	3.303191489	0.615748318	0.784696322	0.051187944
passives (to)	235	2.626595745	0.993253319	0.99662095	0.065012382
Afor	235	2.010638298	1.224245317	1.106456198	0.072177244
*B(di)	235	2.407446809	0.459078923	0.677553631	0.044198725

*passives(for)	235	2.794680851	1.101627569	1.049584474	0.068467342
passives(for)	235	1.436170213	1.025288689	1.0125654	0.066052484
*passives(to)	235	1.573404255	1.401907165	1.184021607	0.077237053
VT+PP	235	2.838297872	0.510199013	0.714282167	0.046594631
合計	2350	2.564574468	1.28817351	1.134977317	0.023412794

Post-hoc test

Fisher's PLSD 危険率 5%

	Differences of means	Critical Value	P	Statistical Significance
Cue Unconscious,Meaning-Dependent	-0.302781	0.1559587	0.000144263	S
Cue Unconscious,Transitional	-0.267483	0.0961603	5.4267E-08	S
Cue Unconscious,Syntax-Oriented	-0.459253	0.0976542	6.36008E-20	S
Meaning-Dependent,Transitional	0.0352983	0.14757	0.63906876	
Meaning-Dependent,Syntax-Oriented	-0.156472	0.1485478	0.038977771	S
Transitional,Syntax-Oriented	-0.19177	0.0836069	7.20097E-06	S
Ato,Afor	1.3244681	0.1584032	3.05182E-57	S
Ato,*B(di)	0.9276596	0.1584032	9.98835E-30	S
Ato,Cto	0.0148936	0.1584032	0.853732131	
Ato,Cfor	0.0319149	0.1584032	0.692806754	
Ato,VT+PP	0.4968085	0.1584032	9.08288E-10	S
Ato,passives (to)	0.7085106	0.1584032	3.36288E-18	S
Ato,passives (for)	1.8989362	0.1584032	9.5995E-110	S
Ato,*passives (to)	1.7617021	0.1584032	4.83547E-96	S
Ato,*passives (for)	0.5404255	0.1584032	2.78449E-11	S
Afor,*B(di)	-0.396809	0.1584032	9.62752E-07	S
Afor,Cto	-1.309574	0.1584032	4.56834E-56	S
Afor,Cfor	-1.292553	0.1584032	9.77226E-55	S
Afor,VT+PP	-0.82766	0.1584032	4.00502E-24	S
Afor,passives (to)	-0.615957	0.1584032	3.52989E-14	S
Afor,passives (for)	0.5744681	0.1584032	1.5213E-12	S

Afor,*passives (to)	0.437234	0.1584032	6.84404E-08	S
Afor,*passives (for)	-0.784043	0.1584032	7.37016E-22	S
*B(di),Cto	-0.912766	0.1584032	7.40854E-29	S
*B(di),Cfor	-0.895745	0.1584032	7.06468E-28	S
*B(di),VT+PP	-0.430851	0.1584032	1.05527E-07	S
*B(di),passives (to)	-0.219149	0.1584032	0.006717004	S
*B(di),passives (for)	0.9712766	0.1584032	2.39971E-32	S
*B(di),*passives (to)	0.8340426	0.1584032	1.82789E-24	S
*B(di),*passives (for)	-0.387234	0.1584032	1.74006E-06	S
Cto,Cfor	0.0170213	0.1584032	0.833125022	
Cto,VT+PP	0.4819149	0.1584032	2.80619E-09	S
Cto,passives (to)	0.693617	0.1584032	1.61599E-17	S
Cto,passives (for)	1.8840426	0.1584032	3.1648E-108	S
Cto,*passives (to)	1.7468085	0.1584032	1.35404E-94	S
Cto,*passives (for)	0.5255319	0.1584032	9.43466E-11	S
Cfor,VT+PP	0.4648936	0.1584032	9.79886E-09	S
Cfor,passives (to)	0.6765957	0.1584032	9.36161E-17	S
Cfor,passives (for)	1.8670213	0.1584032	1.6838E-106	S
Cfor,*passives (to)	1.7297872	0.1584032	5.96529E-93	S
Cfor,*passives (for)	0.5085106	0.1584032	3.66173E-10	S
VT+PP,passives (to)	0.2117021	0.1584032	0.008829376	S
VT+PP,passives (for)	1.4021277	0.1584032	1.54844E-63	S
VT+PP,*passives (to)	1.2648936	0.1584032	1.32469E-52	S
VT+PP,*passives (for)	0.043617	0.1584032	0.589271285	
passives (to),passives (for)	1.1904255	0.1584032	4.75598E-47	S
passives (to),*passives (to)	1.0531915	0.1584032	1.5155E-37	S
passives (to),*passives (for)	-0.168085	0.1584032	0.037557425	S
passives (for),*passives (to)	-0.137234	0.1584032	0.089468329	
passives (for),*passives (for)	-1.358511	0.1584032	5.74686E-60	S
*passives (to),*passives (for)	-1.221277	0.1584032	2.5643E-49	S

Sheffé's level of significance =0.05

	Differences of means	Critical Value	P	Statistical Significance
Cue Unconscious,Meaning-Dependent	-0.302781	0.2224904	0.0023503	S
Cue Unconscious,Transitional	-0.267483	0.1371821	1.699E-06	S
Cue Unconscious,Syntax-Oriented	-0.459253	0.1393133	5.341E-18	S
Meaning-Dependent,Transitional	0.0352983	0.2105231	0.9742882	
Meaning-Dependent,Syntax-Oriented	-0.156472	0.2119179	0.2343631	
Transitional,Syntax-Oriented	-0.19177	0.1192735	0.0001582	S
Ato,Afor	1.3244681	0.3326146	1.014E-49	S
Ato,*B(di)	0.9276596	0.3326146	2.467E-23	S
Ato,Cto	0.0148936	0.3326146	1	
Ato,Cfor	0.0319149	0.3326146	0.9999998	
Ato,VT+PP	0.4968085	0.3326146	2.075E-05	S
Ato,passives (to)	0.7085106	0.3326146	1.101E-12	S
Ato,passives (for)	1.8989362	0.3326146	3.69E-101	S
Ato,*passives (to)	1.7617021	0.3326146	1.141E-87	S
Ato,*passives (for)	0.5404255	0.3326146	1.191E-06	S
Afor,*B(di)	-0.396809	0.3326146	0.0042343	S
Afor,Cto	-1.309574	0.3326146	1.401E-48	S
Afor,Cfor	-1.292553	0.3326146	2.73E-47	S
Afor,VT+PP	-0.82766	0.3326146	4.218E-18	S
Afor,passives (to)	-0.615957	0.3326146	4.029E-09	S
Afor,passives (for)	0.5744681	0.3326146	1.028E-07	S
Afor,*passives (to)	0.437234	0.3326146	0.0006093	S
Afor,*passives (for)	-0.784043	0.3326146	5.17E-16	S
*B(di),Cto	-0.912766	0.3326146	1.622E-22	S
*B(di),Cfor	-0.895745	0.3326146	1.344E-21	S
*B(di),VT+PP	-0.430851	0.3326146	0.0008436	S
*B(di),passives (to)	-0.219149	0.3326146	0.5997089	
*B(di),passives (for)	0.9712766	0.3326146	8.339E-26	S
*B(di),*passives (to)	0.8340426	0.3326146	2.039E-18	S



*B(di),*passives (for)	-0.387234	0.3326146	0.0064199	S
Cto,Cfor	0.0170213	0.3326146	1	
Cto,VT+PP	0.4819149	0.3326146	5.116E-05	S
Cto,passives (to)	0.693617	0.3326146	4.508E-12	S
Cto,passives (for)	1.8840426	0.3326146	1.16E-99	S
Cto,*passives (to)	1.7468085	0.3326146	3.022E-86	S
Cto,*passives (for)	0.5255319	0.3326146	3.276E-06	S
Cfor,VT+PP	0.4648936	0.3326146	0.0001369	S
Cfor,passives (to)	0.6765957	0.3326146	2.166E-11	S
Cfor,passives (for)	1.8670213	0.3326146	5.809E-98	S
Cfor,*passives (to)	1.7297872	0.3326146	1.248E-84	S
Cfor,*passives (for)	0.5085106	0.3326146	9.948E-06	S
VT+PP,passives (to)	0.2117021	0.3326146	0.650768	
VT+PP,passives (for)	1.4021277	0.3326146	7.696E-56	S
VT+PP,*passives (to)	1.2648936	0.3326146	3.17E-45	S
VT+PP,*passives (for)	0.043617	0.3326146	0.9999971	
passives (to),passives (for)	1.1904255	0.3326146	7.351E-40	S
passives (to),*passives (to)	1.0531915	0.3326146	9.579E-31	S
passives (to),*passives (for)	-0.168085	0.3326146	0.8882024	
passives (for),*passives (to)	-0.137234	0.3326146	0.9685369	
passives (for),*passives (for)	-1.358511	0.3326146	2.286E-52	S
*passives (to),*passives (for)	-1.221277	0.3326146	4.768E-42	S

Bonferroni/Dunn level of significance=.05

	Differences of means	Critical Value	P	Statistical Significance
Cue Unconscious,Meaning-Dependent	-0.30278125	0.21000299	0.08010853	S
Cue Unconscious,Transitional	-0.26748295	0.12948269	0.05606722	S
Cue Unconscious,Syntax-Oriented	-0.45925309	0.13149421	0.01942863	S
Meaning-Dependent,Transitional	0.0352983	0.19870731	0.13131058	
Meaning-Dependent,Syntax-Oriented	-0.15647184	0.20002389	0.10830996	
Transitional,Syntax-Oriented	-0.19177013	0.11257916	0.06953411	S

Ato,Afor	1.32446809	0.26372725	0.01580806	S
Ato,*B(di)	0.92765957	0.26372725	0.01761561	S
Ato,Cto	0.01489362	0.26372725	0.02129769	
Ato,Cfor	0.03191489	0.26372725	0.0212674	
Ato,VT+PP	0.49680851	0.26372725	0.01957745	S
Ato,passives (to)	0.70851064	0.26372725	0.0186211	S
Ato,passives (for)	1.89893617	0.26372725	0.01329667	S
Ato,*passives (to)	1.76170213	0.26372725	0.01388157	S
Ato,*passives (for)	0.54042553	0.26372725	0.01938305	S
Afor,*B(di)	-0.39680851	0.26372725	0.02001383	S
Afor,Cto	-1.30957447	0.26372725	0.01587511	S
Afor,Cfor	-1.29255319	0.26372725	0.01595184	S
Afor,VT+PP	-0.82765957	0.26372725	0.01807491	S
Afor,passives (to)	-0.61595745	0.26372725	0.01904259	S
Afor,passives (for)	0.57446809	0.26372725	0.01923011	S
Afor,*passives (to)	0.43723404	0.26372725	0.0198393	S
Afor,*passives (for)	-0.78404255	0.26372725	0.01827512	S
*B(di),Cto	-0.91276596	0.26372725	0.017684	S
*B(di),Cfor	-0.89574468	0.26372725	0.01776218	S
*B(di),VT+PP	-0.43085106	0.26372725	0.01986705	S
*B(di),passives (to)	-0.21914894	0.26372725	0.02072744	
*B(di),passives (for)	0.9712766	0.26372725	0.01741541	S
*B(di),*passives (to)	0.83404255	0.26372725	0.0180456	S
*B(di),*passives (for)	-0.38723404	0.26372725	0.0200547	S
Cto,Cfor	0.01702128	0.26372725	0.02129411	
Cto,VT+PP	0.48191489	0.26372725	0.01964335	S
Cto,passives (to)	0.69361702	0.26372725	0.01868915	S
Cto,passives (for)	1.88404255	0.26372725	0.01335963	S
Cto,*passives (to)	1.74680851	0.26372725	0.01394567	S
Cto,*passives (for)	0.52553191	0.26372725	0.01944964	S
Cfor,VT+PP	0.46489362	0.26372725	0.01971833	S
Cfor,passives (to)	0.67659574	0.26372725	0.01876683	S
Cfor,passives (for)	1.86702128	0.26372725	0.01343175	S
Cfor,*passives (to)	1.72978723	0.26372725	0.01401908	S
Cfor,*passives (for)	0.50851064	0.26372725	0.01952548	S

VT+PP,passives (to)	0.21170213	0.26372725	0.02075444	
VT+PP,passives (for)	1.40212766	0.26372725	0.01545976	S
VT+PP,*passives (to)	1.26489362	0.26372725	0.01607673	S
VT+PP,*passives (for)	0.04361702	0.26372725	0.02124444	
passives (to),passives (for)	1.19042553	0.26372725	0.01641421	S
passives (to),*passives (to)	1.05319149	0.26372725	0.01704005	S
passives (to),*passives (for)	-0.16808511	0.26372725	0.02090541	
passives (for),*passives (to)	-0.13723404	0.26372725	0.02100362	
passives (for),*passives (for)	-1.35851064	0.26372725	0.0156551	S
*passives (to),*passives (for)	-1.2212766	0.26372725	0.01627419	S