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A Statistical Analysis of English Double Object Alternation

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This paper explores the phenomenon of post verbal alternation in English double object constructions, and presents a statistical model for predicting the position of the indirect object in instances where alternation is unconstrained (e.g. "Roger gave us the clothes," vs. "Roger gave the clothes to us."). Analysis covers a large set of written and oral American English data using a parametric multiple regression instrument to establish the relationship of a set of grammatical and discourse variables to a binary dependent variable, in this case the post-verbal position of the indirect object.

INTRODUCTION

Alternation in English double object argument constructions raises an interesting set of questions for linguists, including those concerning constraints and influence on alternation. Questions of grammatical constraints on alternation are important to an overall understanding of double object constructions and there is much in the literature on morphological, phonological and syntactic constraints on alternation (Groppen, Pinker, Hollander, Goldenberg, Wilson, 1989; Mazurkewich & White, 1984; Oehrle, 1976 and others). This study addresses the narrower question of whether or not double object alternation, when unconstrained, is predictable. That both versions of most double object constructions (1a and b) are equally acceptable to most native speakers of English, even out of context, suggests that perhaps alternation in double object constructions is optional.

- (1) a. Roger gave the clothes to us.
 b. Roger gave us the clothes.

However, there is evidence from previous studies (Halliday, 1970; Smyth, Prideaux & Hogan, 1979; Erteschik-Shir, 1979; Thompson, 1987; Williams, 1989; and others) that double object alternation is influenced by grammatical and discourse properties of the double object constituents themselves. Of these, the studies by Thompson (1987) and Williams (1989) examine large corpora of data and offer predictive models for the order of double object constituents.

This study differs from previous ones in two important ways. First, it presents a statistical model which predicts the position of the indirect object by taking into account a set of syntactic, lexical, and discourse variables associated with it, and second, it finds variables not considered in previous studies to be influential in determining the position of the indirect object.

THEMATIC ROLES OF POST-VERBAL ARGUMENTS

For the purpose of this study, the terms *theme* (T) and *goal* (G) will be used instead of direct object and indirect object, respectively. These terms reflect the thematic role of the arguments, and their use avoids a host of problems, including the word order related problem of using the term *indirect object* when this argument appears in the immediate post-verbal position without a preposition. The definitions of the terms *theme* and *goal* as used in this study are taken from the Thematic Relations Hypothesis (Gruber, 1976; Jackendoff, 1972, 1978, 1983), whereby, in the case of double object constructions, *theme* refers to a concrete or abstract entity which undergoes a change of position or state as defined by the *goal*, which is the recipient or target of the *theme*. So in the case of (1a), the object physically changes position, whereas in (2)

- (2) Richard told John a story.

the theme is transferred to an abstract place, in this case John's mind.

BACKGROUND

The notion that double object alternation is not optional but rather influenced in some way at the sentential and/or discourse level is not new. Smyth, Prideaux and Hogan (1979) noted that the relative order of the two objects in a double object construction is governed by preceding context. In this study, post-verbal word order is said to be either contextually motivated or contextually unmotivated. Word order is contextually motivated when "...the use of that device is based on the fulfillment of expectations developed in the context" (1979, p. 29). So, in answering the question "Who did you give the book to?", the word order in (3)

(3) I gave the book to Moses.

can be said to be contextually motivated, since it places the indirect object in the end or 'prominent' position in order to fulfill the expectations raised by the preceding question. The word order in (4), however,

(4) I poured myself some wine, then passed the bottle to Wayne.

can be said to be contextually unmotivated, since there are no expectations set in the preceding context which cause the indirect object to be placed in the end or 'prominent' position.

According to Smyth, et al. (1976), when post-verbal word order is contextually motivated, then that word order is constrained by a 'given-new' distinction (Halliday, 1967, 1968; Chafe, 1970, 1972, 1974, 1976, 1987). This distinction is based upon what the speaker assumes to be in the hearer's consciousness at the time of the utterance. If an element is assumed by the speaker to be in the hearer's consciousness, then it is 'given' information; if it is not, then it can be classified as 'new' information. Thus in a double object construction where word order is contextually motivated, a constituent that is 'new' will occupy the end position and one that is 'given' will occupy the immediate post-verbal position. In double object sentences where word order is contextually unmotivated, word order is unconstrained and optional. Smyth et al. tested this

theory using a recognition memory task and found their subjects to be "sensitive to changes in dative position in motivating contexts but not in nonmotivating contexts" (1976, p. 27).

Erteschik-Shir (1979) defines the discourse function of double object alternation in terms of a principle of dominance, according to which the sentence-final position is reserved for dominant material. According to the author, an element in a sentence is considered dominant if the speaker's intention in uttering the sentence is to direct the hearer's attention to the intension, or syntactic content, of that particular element. This principle is distinguished from other information flow theories, such as 'given-new information' (Chafe, 1976) and communicative dynamism (CD) (Firbas, 1974) by the fact that dominance is seen as an absolute property whereas 'given-new' and CD are relative properties. Accordingly, there can be no opposition between the relative dominance of two object constituents; a constituent is either dominant in a given sentence or it is not. Further, Erteschik-Shir proposed a hierarchy of determiners, wherein indefinites (indefinite or \emptyset article) are said to indicate that an element is dominant, and definites (definite articles, possessive determiners, pronouns, etc.) usually indicate that an object constituent is nondominant. It is possible, however, for a definite NP to be interpreted as dominant, and the addition of a relative clause giving additional information about the definite noun will be even more easily interpreted as being dominant. This coincides with the so called "heavy NP shift" transformation, whereby a "heavy" or "lengthy" NP will be moved to the sentence final position, and thus interpreted as being dominant. According to this hierarchy, pronouns can be used dominantly only when they are meant to be interpreted contrastively. In accordance with research mentioned above, Erteschik-Shir believes that the pronoun *it* can never be used dominantly, that is, appear in the end position. According to Erteschik-Shir, then, the function of double object alternation is to "force a dominant interpretation of the NP that ends up in final position" (1976, p. 451).

In a more recent study, Thompson (1988) looks at double object alternation from a different perspective. Thompson's study focuses on constituents which possess a cluster of "topicworthy" grammatical and discourse properties and their relationship to the immediate post-verbal position in a double object construction.

These properties - *animacy, pronominality, specificity, identifiability, proper nounhood, length and givenness* - are identical to those most often found in grammatical subjects in English sentences which, according to Thompson, are the "grammaticization of discourse topics" (1987, p.3). Thus the designation topicworthy.

Thompson's database consisted of 196 clauses where indirect object movement was allowed. She coded each indirect object and direct object for the dependent variable *position* (either immediate "post-verbal" or "end"), and for the presence and degree of the independent topicworthy variables mentioned in the previous paragraph. Thompson found that Gs were more likely than Ts to have topicworthy properties and that Gs in the immediate post-verbal position were more likely to have topicworthy properties than Gs in the end position. She therefore concluded that 1) non-subject topicworthy arguments in English are more likely to occupy the immediate post-verbal position and that "where there is competition for this position, the more topicworthy argument wins" (1987, p. 2, p. 4) indirect object movement is not an optional operation but is instead determined by the speaker's need to manage information flow.

THE PRESENT STUDY

The present study owes much to Thompson (1987) in its basic construction in that it is also concerned with topicworthiness and the non-subject topic position as defined in therein. However, in the analysis which follows, the list of possible topicworthy properties has been expanded. In addition, and most importantly, this study includes a statistical model which identifies and uses topicworthy independent variables to predict the position of G in a given double object construction.

There are eight independent variables examined in this study which were chosen because they were either hypothesized or found in previous studies to have a relationship to the post-verbal order of the constituents in double object constructions. These are: *syntactic class of the verb (transitive/intransitive), register (formal/informal), modality (written/oral), givenness, prosodic length of G versus T,*

definiteness of G, animacy of G, and specificity of G. The variables *syntactic class of the verb, register, and modality*, though different from the other variables in that they are not actual properties of G, were added to the present study because they were found in a previous study (Williams, 1989) to have some relation to the position of G. It is hypothesized, based upon previous studies, that the variables *ditransitive verbal syntactic class, informal register, oral discourse mode* as well as the properties in G of *givenness, prosodic length shorter than that of T, definiteness, animacy and specificity* will influence the likelihood of G being in the immediate post-verbal position.

Data Base

In selecting the corpus used in this study, it was my intention to collect as representative a sample as possible of American English speech and writing. For that reason, an attempt was made to construct a corpus reflecting the diversity of gender, class, race and region which make up the native English speaking American populace. The data base was taken from four different genres of spoken discourse and eight different genres of written discourse. The spoken discourse consisted of oral history (two sources), congressional hearings (transcripts of the Watergate hearings), and two genres taken from the UCLA Oral Corpus: classroom dialog and advice giving (transcripts from three radio call-in talk shows). The written discourse in the data base was taken from the genres of biography, fiction, inter-office electronic communication, news magazines, newspapers, non-fiction, academic writing and sports writing.

Methods

Tokens of double object constructions were extracted from each source, yielding a total of 168 (74 from the written discourse and 94 from the spoken). Of these, 149 tokens were dative and 19 were benefactive. Eliciting verbs, the most frequently used of which is *ask*, usually take the preposition *of*. However, if T is a clause, such as in the sentence

- (5) John asked us if we could come an hour early,

T must appear in the end position. Since only one instance (6) of an eliciting verb allowing all three positions occurred in the data, this type of verb will not be considered in this study.

(6) Diane asked her new friend a question.

Only sentences allowing double object alternation were used in the study. Thus, sentences such as those in (7) or (8) were not considered.

(7) a. The shirt cost me ten dollars.
b. *The shirt cost ten dollars to me.

(8) a. Mr. Johnson explained the situation to us.
b. *Mr. Johnson explained us the situation.

The sentences used in the study were coded for the dependent variable position of G (either post-verbal or end), and the independent variables syntactic class of the verb, register, modality, animacy of G, definiteness of G, specificity of G, prosodic length of G versus T, and givenness of G. The data were then analyzed for the relationship of the independent variables to the position of G, using The Logistic Procedure (SAS Institute, 1985), a parametric multiple regression instrument. This procedure was used rather than a Chi-square or multiple regression procedure because it alone allows for the testing of the relationship of a large number of independent variables to a dichotomous dependent variable.

Statistical Procedure

Using statistical tests on any natural language data is problematic because the argument can be made that data from individual speakers violate the assumption of independence required by most tests. In order to make these data more independent, an aggregate data set was created from the original data (n=168) by collapsing tokens from speakers contributing more than one token. This was accomplished by computing a within-speaker mean for the variable prosodic length of G and a within-speaker mode for all other variables. The aggregate tokens were added to data from

speakers producing single tokens, resulting in a data set ($n=59$) consisting of one token per speaker, hereafter referred to as the aggregate data set. Since the statistical instrument was only applied to the collapsed data, all percentages resulting from the statistical test or taken from the raw data will refer to the collapsed data unless otherwise specified. All examples and counterexamples used in discussing the results or for clarification purposes are taken from the original data set.

Data were analyzed using The Logistic Procedure (op. cite), a parametric multiple regression instrument which is unlike other regression tests in two ways. First, it allows for a dichotomous dependent variable, and second, the results are computed in terms of a Chi-square statistic rather than correlation and r^2 . The Logistic Procedure (op. cite) uses maximum likelihood procedures to examine the relationship between the response probability of the dependent variable, in this case the position of G, and the independent variables. In this instance, the procedure was programmed to identify and enter only the most powerful independent variables into a stepwise equation, entering the most powerful variable first. If the first variable entered achieves a level of significance (for this study $\alpha=.05$), it can be said to be independently significant in its relationship to the dependent variable. All subsequently entered variables reaching the .05 level, however, are only significant as members of the larger set of independent variables. As with Chi-square and regression procedures, the fact that a variable reaches the significance level of .05% does not imply causality. What it does imply is that there is a statistically significant relationship between a dependent variable and a group of independent variables, thus providing a predictive model, in this study for the position of G.

Variables

The following variables were entered into the model.

Syntactic Class of Verb

This variable is used to explore the relationship between transitive verbs, such as *read*, which subcategorize for only one

object but which may take two objects and ditransitive verbs, such as *give*, which subcategorize for two objects.

Register

In placing the different genres into formal and informal categories, all spoken discourse was considered to be less formal than the written discourse. For the purpose of this analysis, all genres of written discourse in this study were considered formal. Within the spoken discourse, the data from the Watergate hearings were considered to be formal spoken discourse, whereas all other genres were considered informal. The Watergate data were then combined with the written data to constitute the formal category, while the remainder of the spoken discourse formed the informal category.

Modality

This variable is included to examine the possible effect of written versus oral discourse on the position of G.

Givenness of G

Givenness is defined here as the degree to which the speaker/writer presupposes an element to be in the hearer/reader's consciousness at the time of the utterance (Chafe, 1987). This is obviously difficult to gauge. The concept of referential distance (Givón, 1983; Chen, 1986) will be used to determine givenness. Referential distance is determined by the distance in clauses from the object constituent to its last referent in the preceding discourse. This also takes into account the principle of entailment, which is based on schema theory (Bartlett, 1932; Tannen, 1979). Within the framework of this theory, a schema can be defined as a "...cluster of interrelated expectations" (Chafe, 1986, p. 29). Once a schema has been invoked in a narrative, then all of the expectations that constitute the schema can be accorded some degree of givenness as well. Accordingly, the schema *house* entails such expectations as *window*, *door*, *room*, etc. If, for example, an object constituent is *window*, and it has no previous mention in the discourse, but *house* does, then its referential distance will be calculated from the last

mention of *house*. This kind of entailment will be referred to as lexical entailment. Moreover, there are certain cases where a word can be said to be given by entailment, even if there is no direct lexical entailment in the previous discourse. In sentence (9)

(9) If you find the book, send it to me

me can be said to be given, because the hearer is aware that he is being spoken to and will have no problem in knowing that *me* refers to the speaker. "First and second person referents acquire the given status naturally from the conversational context itself" (Chafe, 1974, pp. 123-124). This kind of entailment will be referred to as contextual entailment.

Prosodic Length of G vs. T

This is a dichotomous variable where G either has a prosodic length which is less than or equal to T, or is greater than T. In computing prosodic length, all determiners and modifiers are counted along with G. For the purpose of this study, prosodic length is measured according to moraic theory (Hyman, 1985). Mora (symbolized by the lower case Greek letter Mu (μ)) are units of prosodic weight which are projected from syllabic nuclei and coda. Onsets are considered to have no weight and thus project no mora. English syllables may consist of one mora, where the syllable has the shape (C)(C)V, or two mora, in the case of syllables with either the shape (C)(C)VV (diphthong) or (C)(C)VC(C). No syllable can have more than two mora. In the case of

(10) David gave Cynthia a large black dog

G would have the moraic structure in (11) and T that of (12).

(11) Cyn.thi.a
 $\begin{array}{c} \downarrow \downarrow \quad \downarrow \downarrow \\ \mu\mu \quad \mu\mu \\ \downarrow \quad \downarrow \\ \sigma \quad \sigma\sigma \end{array}$

(12) a large black dog
 $\begin{array}{c} \downarrow \downarrow \quad \downarrow \downarrow \quad \downarrow \downarrow \quad \downarrow \downarrow \\ \mu\mu \quad \mu\mu \quad \mu\mu \quad \mu\mu \\ \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \\ \sigma \quad \sigma \quad \sigma \quad \sigma \end{array}$

Therefore in (10), G has slightly more than half the prosodic length of T, but since this variable is considered dichotomous, it is only important that G is less than or equal to T.

Definiteness of G

Definiteness is defined by the type of determiner used with G. Constituents with demonstrative pronouns, definite articles, and possessives as determiners as well as proper nouns and pronouns were considered definite, whereas constituents with an indefinite article determiner, a cardinal number determiner or an indefinite quantifier (e.g., a few, many, several) were considered indefinite.

Animacy of G

Animacy is treated as a dichotomous variable, with humans, animals, and entities made up of humans (e.g., company, government, team) being considered as animate. There were, however, no tokens in the data where G was an animal.

Specificity of G

A constituent is considered to be specific unless it has no referent or refers to a class of entities. For example, in the sentence *Teachers give boys a lot of attention*, the G *boys* is considered non-specific.

ANALYSIS

The Post-Verbal + Preposition

Typically, only the post-verbal and end positions have been listed as possibilities for double object alternation. It is possible, though, to have a sentence such as

- (15) Eisenhower...forwarded [Gto each of them] [TA formal Letter of Appreciation.]

Since, however, the occurrence of G in this position was not found in the present data, it is impossible to determine the probable cause of G being in this position. In a similar previous study using data taken from written discourse (Williams, 1988), only three instances of G in this position were found. The fact that sentences such as (15) are so rare could indicate that this position for G is a stylistic option found mainly in written discourse and is not strictly rule-governed. For these reasons, subsequent discussion will concern only the immediate post-verbal and end positions for G.

Characteristics of the Data

The distributive characteristics for individual variables in both the original and aggregate data sets are presented below in Tables 1 - 9.

Table 1: Distributional Characteristics of Position (%)

Position of G	Immediate P-V	End
Original	65	35
Aggregate	73	27

Table 2: Distributional Characteristics of Mode (%)

Mode of G	Oral	Written
Original	57	43
Aggregate	47	53

Table 3: Distributional Characteristics of Syntactic Type (%)

Syntactic Type of G	Transitive	Ditransitive
Original	38	62
Aggregate	39	61

Table 4: Distributional Characteristics of Register (%)

Register of G	Informal	Formal
Original	56	44
Aggregate	53	47

Table 5: Distributional Characteristics of Givenness (%)

Givenness of G	Entailment	0-1 Clause	2-4 Clauses	>5 Clauses
Original	47	19	3	31
Aggregate	54	15	2	29

Table 6: Distributional Characteristics of Length of G vs. T (%)

Lgt of G vs.T	G<T	G>T
Original	77	23
Aggregate	83	17

Table 7: Distributional Characteristics of Definiteness (%)

Definiteness	(+) Definite	(-) Definite
Original	89	11
Aggregate	98	2

Table 8: Distributional Characteristics of Animacy (%)

Animacy of G	(+) Animate	(-) Animate
Original	93	7
Aggregate	97	3

Table 9: Specificity (%)

Specificity of G	(+) Specific	(-) Specific
Original	94	6
Aggregate	100	0

With the exception of the variable mode, which is in inverse proportion in the original and aggregate data sets, all other variables are of roughly the same proportions in both data sets, though Specificity is somewhat problematic in the aggregate data set since it indicates that all Gs are specific, which is not in fact the case. The variables Animacy and Definiteness are also problematic, since, as with Specificity, a very high percentage of Gs are (+) animate and (+) definite. This fact makes a statistical analysis of the relationship between these three variables and the position of G difficult since a high percentage of Gs in both the immediate post-verbal and end positions are likely to be animate, definite and specific. Because of the disproportionate distributional characteristics of these variables, especially in the aggregate data set, Definiteness, Animacy, and Specificity were not entered into the regression equation.

RESULTS

Results do not support the hypothesis that all independent variables in the study, taken as a group, are predictors of the position of G. However, three of the independent variables were found to have a significant relationship to the position of G: prosodic length of G vs. T ($p > 0.0001$), syntactic class of verb ($p > 0.0047$), and register ($p > 0.0212$). The variable prosodic length of G vs. T, where G was shorter than T, was found to have the strongest relationship and, since it was entered into the equation first, can be said to be individually significant. The variables syntactic class of verb (ditransitive) and register (informal) are only significant as members of the group of three significant variables. No other variables reached the level of significance needed for entry into the model.

DISCUSSION

In the case of givenness the data neither support the initial hypothesis of this study nor the information flow theories of Chafe

(1976) or Erteschik-Shir (1979), since givenness did not reach the threshold of significance for entry into the model.

Table 10: Givenness

Position of G:	Immediate P-V	End
Givenness of G:		
Entailment	27 (84%)	5 (16%)
0-1 clause	8 (89%)	1 (11%)
2-4 clauses	1 (100%)	0 (0%)
>5 clauses	7 (41%)	10 (59%)

Considering the percentages in Table 10, it is clear that Gs which contain given information (from entailment up to 4 clauses) are much more likely to occupy the immediate post-verbal position than the end position. However, it is possible that givenness was not found to be significant because there is a high percentage of Gs which contain information that is not given (> 5 clauses) also occupy the immediate post-verbal position.

It is possible, though, that givenness and dominance do influence double object alternation in that they are not unrelated to prosodic length. It could be argued that whatever constituent the speaker intends to be dominant would be modified more than a non-dominant constituent and thus would be longer in terms of prosodic length. Likewise, new, as opposed to given, information would also require greater modification. The data show, in fact, that G contains given information and is shorter than T in 58% of the cases.

Prosodic Length of G vs. T

From the raw data (Table 11), this variable appears to have the strongest relation to the position of G of the three, and as mentioned previously, is the only variable found to have a relationship to the position of G independent from the other two variables in the significant group. G is in the post-verbal position 84% of the time when G is shorter in prosodic length than T. Conversely, G is much more likely to occupy the end position when it is greater in prosodic length than T (80%).

Table 11: Prosodic Length of G vs. T and the Position of G

Position of G:	Immediate P-V	End
Lgt of G vs. T:		
G<T	41 (84%)	8 (16%)
G>T	2 (20%)	8 (80%)

There are no instances in the data set where G is in the post-verbal position and none of the significant predictors are present. The fact that two or three predictors are present in 93% of such cases underscores the statistical finding that a cluster of properties is necessary for predictability. Of the eight cases in the original data where G is in the post-verbal position and only one predictor is present, greater prosodic length in G accounts for six examples, which supports its tendency to be primary among predictors. There is another kind of possible counter-example. Where G is in the end position in informal discourse, where the example has a ditransitive verb, and where G is shorter in prosodic length than T, we would expect it to occupy the immediate post-verbal position, which is the case in all but two instances in the data, shown in the following examples.

- (14) He pulled out this cellophane packet and handed it to me, and there was his hair in it.
- (15) We took home the 45 and worked on our own arrangement, two vocals and a piano in Jan's garage, and we gave the tape to Lou.

In (14), the presence of pronominal T seems to prohibit G from appearing in the post-verbal position. The second counter-example is interesting because all three predictors are present but G is in the end position. However, I am not claiming that this model can predict 100% of variability and it is beyond the scope of this study to identify the amount of variation predicted, so counter-examples such as (15) should not be unexpected. What is unexpected is that there are not more of them in the data, a fact that is possibly unique to this data set and perhaps not indicative of other data. In any case, there is obviously room for the individual speaker

to manipulate double object alternation for reasons other than those accounted for in the present study. Thus, speakers could intentionally choose one order over another to focus on differences in meaning. For example, some speakers perceive a difference in meaning in the following sentences which could motivate choice of order.

- (16) a. He got the papers to the President early Monday morning.
- b. He got the President the papers early Monday morning.

Syntactic Class of Verb

The results support the hypothesis that the domain of a ditransitive verb has a relationship to position of G, though only in conjunction with the other two significant independent variables. In particular, the results show that in double object sentences where the verb is ditransitive, G is likely to be in the immediate post-verbal position (83%). The raw data suggest that the domain of a transitive verb also seems to be related to the immediate post-verbal positioning of G, though somewhat less than a ditransitive domain.

Table 12: Syntactic Class of Verb and the Position of G

Position of G:	Immediate P-V	End
Syntactic Class:		
Transitive	13 (56%)	10 (44%)
Ditransitive	30 (83%)	6 (17%)

Of 22 cases in the data set where there is a ditransitive verb and G in the end position, 19 of these involve G being longer than T, as in example (17), again underscoring the primacy of prosodic length among predictor variables.

- (17) Irish quarterback Tony Rice had just handed the ball to fullback Anthony Johnson.

However, syntactic class and length cannot explain all of the examples in the data. The following three counter-examples (18,

19, and 20) are cases where G is in the end position with a ditransitive verb and is either shorter in prosodic length than T or where G and T are of equal length.

- (18) Now you say that you then prepared a political matters memorandum for Mr. Haldeman.
- (19) I did take the responsibility - have the responsibility, for getting the materials to the President for making decisions.
- (20) For example, when Estelle T. Griswold and Dr. C. Lee Buxton were convicted in Connecticut of giving birth control advice to persons in violation of that state's anti birth control statute.

All three sentences, however, are examples of formal discourse.

Register

The results show that informal discourse setting is significantly related to G being in the immediate post-verbal position and, taken with syntactic class and prosodic length of G vs. T, is a predictor of the position of G. In an informal discourse setting, G is in the immediate post-verbal position in approximately 80% of tokens (Table 13). However, where the discourse setting is formal, G occupies this position in 64% of the tokens, underscoring the status of register as the weakest of the three predicting variables.

Table 13: Register and the Position of G

Position of G:	Immediate P-V	End
Discourse Set:		
Informal	25 (81%)	6 (19%)
Formal	18 (64%)	10 (36%)

Had formal and informal registers been defined differently, for example in context with the relative social status of the speakers, the results may have been very different. This will be a point of further research as the model is refined.

CONCLUSIONS

Analysis of a large data base of written and spoken American English failed to confirm the hypothesis that the variables ditransitive verbal syntactic class, informal register, oral discourse mode, as well as the properties in G of givenness, prosodic length shorter than that of T, definiteness, animacy, and specificity are predictors of the position of G in a double object argument. The analysis did find that the variables prosodic length of G vs. T, syntactic class of verb, and register, when considered as a cluster, are predictors of the position of G. The specific variable settings found to be significant are prosodic length of G < T, ditransitive syntactic class, and informal register. Further, the variable prosodic length of G vs. T was found to be the most powerful as well as the only variable to be individually significant. Though the definition and coding of the independent variables could be questioned, a statistical model which is able to predict the post-verbal order of constituents in a double object construction has been presented. Further research is needed to refine the model; future studies could utilize alternate definitions of the independent variables (e.g., register, givenness) used in this study or focus on other possible independent variables.

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NOTE

¹ For the purpose of clarity, I have used my G and T terminology in discussing Thompson's study. However, Thompson uses the terms R (recipient) for indirect objects and P (patient) for direct objects.

REFERENCES

- Akmajian, A. & Heny, F. (1975). *An introduction to the principles of transformational syntax*. Cambridge, MA: MIT Press.
- Bartlett, F. C. (1932). *Remembering*. Cambridge: Cambridge University Press.
- Celce-Murcia, M. & Larsen-Freeman, D. (1983). *The grammar book: An ESL/EFL teacher's course*. Rowley, MA: Newbury House, Inc.
- Chafe, W. (1970). *Meaning and the structure of language*. Chicago: University of Chicago Press.
- Chafe, W. (1972). Discourse structure and human knowledge. In: J. Carroll and R. Freedle (Eds.), *Language comprehension and the acquisition of knowledge* (pp. 41-69). Washington D.C.: V.H. Winston.
- Chafe, W. (1974). Language and consciousness. *Language* 50, 11-133.
- Chafe, W. (1976). Givenness, contrastiveness, definiteness, subjects, topics, and point of view. In C. Li (Ed.), *Subject and topic* (pp. 25-55). New York: Academic Press.
- Chafe, W. (1987). Cognitive constraints on information flow. In Tomlin, R. (Ed.), *Coherence and grounding in discourse*. Amsterdam: John Benjamins Publishing Company.
- Chen, P. (1986). Discourse and particle movement in English. *Studies in language*, 10(1), 79-95.
- Chomsky, N. (1981). *Lectures on government and binding*. Dordrecht, Netherlands: Foris Publications.
- Chomsky, N. (1982). *Some aspects of the theory of government and binding*. Cambridge, MA: MIT Press.
- Dryer, M. (1986). Primary objects, secondary object and antitativity. *Language*, 10(4), 808-845.
- Emonds, J. E. (1976). *A transformational approach to English syntax: Root, structure-preserving, and local transformations*. New York: Academic Press.
- Erteschik-Shir, N. (1979). Discourse constraints on dative movement. In T. Givón (Ed.) *Discourse and Syntax*. New York: Academic Press.
- Fillmore, C. J. (1965). *Indirect object construction and the ordering of transformations*. The Hague: Mouton.
- Fillmore, C. J. (1966). A proposal concerning English prepositions. *Monograph series on language and linguistics*, Georgetown University 19, 19-33.
- Fillmore, C. J. (1968). The case for case. In E. Bach and R. Harms (Eds.), *Universals in linguistic theory*. New York: Holt, Rinehart and Winston.

- Fillmore, C. J. (1971). Some problems for case grammar. *Monograph series on language and linguistics*, Georgetown University 24, 35-56.
- Fillmore, C. J. (1977). The case for case reopened. In P. Cole and J. Sadock (Eds.), *Syntax and syntactics 8: grammatical relations*. New York: Academic Press.
- Givón, T. (1979). *Syntax and semantics* vol. 12: *Discourse and syntax*. New York: Academic Press.
- Givón, T. (1984). Direct object and dative shifting: syntactic and pragmatic case. In F. Plank (Ed.), *Objects: towards a theory of grammatical relations*. London: Academic Press.
- Gruber, J. (1976). *Lexical structures in syntax and semantics*. Amsterdam: North Holland.
- Gropen, J., Pinker, S., Hollander, M., Goldenberg, R., & Wilson, R. (1989). The learnability and acquisition of the dative alternation in English. *Language* 56(2).
- Halliday, M.A.K. (1970). Language structure and language function. In J. Lyons (Ed.), *New horizons in linguistics*, pp. 140-165. Harmondsworth, Middlesex: Penguin books.
- Hyman, L. (1985). *A theory of phonological weight*. Dordrecht, Netherlands: Foris Publications.
- Jackendoff, R. (1972). *Semantic interpretation in generative grammar*. Cambridge, MA: MIT Press.
- Jackendoff, R. (1978). Grammar as evidence for conceptual structure. In M. Halle, J. Bresnan, and G. Miller, eds., *Linguistic theory and psychological reality*. Cambridge, MA: MIT Press.
- Jackendoff, R. (1983). *Semantics and cognition*. Cambridge, MA: MIT Press.
- Jespersen, O. (1933). *Essentials of English grammar*. New York: H. Holt & Co.
- Kayne, Richard S. (1984). *Connectedness and binary branching*. Dordrecht, Netherlands: Foris Publications.
- Mazurkewich, I. & White, L. (1984). The acquisition of the dative alternation: Unlearning overgeneralizations. *Cognition*, 16, 261-283.
- Oehrle, R. (1975). Dative in English. Unpublished doctoral dissertation, M.I.T., Cambridge, MA.
- Quirk, R., Greenbaum, S., Leech, G., & Svartvik, J. (1985). *A comprehensive grammar of the English language*. New York: Longman.
- Ransom, E. (1979). Definiteness and animacy constraints on passive and double object constructions in English. *Glossa*, 13(2), 215-240.
- SAS Institute. (1985). *SAS user's guide: Basics*. Cary, NC: SAS Institute.
- Smyth, R. H., Prideaux, G. D., & Hogan, J. T. (1979). The effect of context on dative position. *Lingua*, 47, 27-42.
- Tannen, D. (1979). What's in a frame? Surface evidence for underlying expectations. In R.T. Freedle (Ed.), *Discourse processing: new directions*. Norwood, NJ: Ablex.

- Tomlin, R. (Ed.) (1987). *Coherence and grounding in discourse*. Amsterdam: John Benjamins Publishing Company.
- Thompson, S. (1987). Information flow and 'dative shift' in English discourse. Unpublished manuscript.
- Thompson, S. & Koide, Y. (1987). Iconicity and 'indirect objects' in English. *Journal of Pragmatics*, 11, 399-406.
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