EMPIRICAL CONSTRAINTS ON THE VERB-PARTICLE CONSTRUCTION IN ENGLISH[1]

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1. <u>Introduction.</u> It is well-known that English contains what has come to be called the 'verb-particle' construction (Fraser 1976), in which the particle may be positioned immediately after the verb or it may be separated from the verb by a NP, as in (1) and (2):

(1) a. The janitor threw out the rickety and badly scratched chair.
    b. The janitor threw the rickety and badly scratched chair out.
(2) a. The janitor wanted to throw out the rickety and badly scratched chair.
    b. The janitor wanted to throw the rickety and badly scratched chair out.

It has been frequently noted that certain structures, unlike those in (1) and (2), either require or forbid positioning of the particle away from its verb. For example, if the direct object NP is a pronoun, the particle must be positioned after the pronoun, as in (3), but if the sentence is a passive, the particle must remain with its verb as in (4).

(3) a. Sam gave it away.
    b. *Sam gave away it.
(4) a. The trash was taken out by Sam.
    b. *The trash was taken by Sam out.

Considerable attention has been focused on the defining characteristics of the verb-particle ('V-PRT') structures in order to different-iate them from those structures which also contain a verb followed by what appears to be a preposition, as in (5).

(5) a. He turned up the driveway.
    b. He looked at a new shirt.

In cases such as (5), the preposition cannot 'move' to a post-object position. Bolinger (1971), in his discussion of 'phrasal verbs,' offer-ed several syntactic tests for membership in the true verb-particle class, including the following:

(6) a. The verb-particle combination is replaceable by a single verb (e.g., 'throw away' = 'discard').
    b. If transitive, the combination should passivize (e.g.,

THE DISTANCE HYPOTHESIS. The acceptability of a sentence
containing a verb and particle decreases as the number of words
separating the verb and particle increases.

It would appear, however, that while distance can be measured in
terms of the number of words separating the verb and its particle, the
organization of the intervening words might also contribute to the
relative naturalness of the sentence. If we consider the sentences in
(9), we notice that the distance between the verb and particle is con-
stant, and accordingly the Distance Hypothesis would predict that all
three would be equally acceptable.

(9) a. The janitor threw the chair with a badly broken leg away.
    b. The janitor threw the chair which had a broken leg away.
    c. The janitor threw the rickety and badly marred up chair
       away.

These examples suggest that more than just the number of words between
the verb and particle contribute to the relative acceptability of verb-
particle sentences. In particular, the structure of the intervening
material seems crucial. This observation suggests a further hypothesis,
namely:

THE COMPLEXITY HYPOTHESIS. The more structurally complex the
material intervening between a verb and its particle, the less
acceptable and natural the sentence will be.

Most writers discussing the problem of particle placement after a
'heavy' NP have focused on the length of the sequence intervening be-
tween verb and particle and have devoted relatively little attention to
the intervening structural complexity. Bolinger (1971). for example,
offered little more than that a particle might equally well appear be-
fore or after a relative clause. Nevertheless, it is apparent that the
intervening structural complexity is an important issue.

2.0 The Experiment. In order to determine which of the three
hypotheses best accounts for the verb-particle placement, an experiment
was conducted in which subjects were instructed to make overt acceptab-
ility judgements on verb-particle sentences. To this point, sentences
representing the following structures have been examined:

Type Ia.	NP V PRT NP (cf. 1a)
Type Ib.	NP V NP PRT (1b)
Type IIa.	NP V to V PRT NP (2a)
Type IIb.	NP V to V NP PRT (2b)
Type IIIa.	NP V PRT NP PP (7a)
Type IIIb.	NP V NP PRT PP (7b)
Type IIIc.	NP V NP PP PRT (7c)
Type IVa.	NP V PRT NP RC (8a)
Type IVb.	NP V NP PRT RC (8b)
Type IVc.	NP V NP RC PRT (8c)

Type I contains only a direct object NP, with the particle positioned either before or after the object, while Type II is just like the first except for the fact that the verb-particle structure in within an infinitive. Type III contains a direct object NP plus a PP, and the three sub-types are defined in terms of the particle placement. Type IV contains a direct object NP plus a relative clause, with particle placement again determining the three sub-types.

The Free Position Hypothesis would claim that within any Type, any of the options should be equally acceptable. The Distance Hypothesis predicts that Type Ia should be more acceptable than Ib, and IIa more acceptable than IIb. Moreover if the lengths of PPs and RCs are held constant, it predicts that IIIa and IVa should be equally acceptable, as should IIIb and IVb, and IIIc and IVc. Finally, the Complexity Hypothesis makes the same predictions as the Distance Hypothesis, except that IIIc should be more acceptable than IVc, since a PP has less structural complexity than a relative clause. These predictions are represented in Table 1. The empirical question is simply: Which one, if any, is correct?

Table 1. Acceptability Predictions

Hypothesis	Predicted Relative Naturalness
Free Position	Ia=Ib; IIa=IIb; IIIa=IIIb=IIIc; IVa=IVb=IVc
Distance	Ia> Ib; IIa>IIb; IIIa, IVa>IIIb, IVb>IIIc, IVc
Complexity	Ia>Ib; IIa>IIb; IIIa, IVa>IIIb, IVb> IIIc>IVc

'>' = 'is relatively more acceptable and natural than'

2.1 **Method.** Sixty-four grade twelve students from an Edmonton school participated in the experiment. The subjects, who were either 17 or 18 years of age, consisted of 26 males and 38 females. Thirty-one were enrolled in an English matriculation course while 33 were in a non-matriculation equivalent. All but six indicated that they were native speakers of English.

All the verb-particle constructions included in the experiment were of the 'moveable' variety, with a major portion being selected from Fraser's (1976) representative listing of frequently encountered verb-particle combinations. Three separate lists of stimuli were constructed. The first list (List A), with stimuli corresponding to the structures of Type I, contained eight distinct sentences, with four replicates of Type Ia and four of Type Ib. Half of the stimuli had definite

direct objects and half had indefinite direct objects yielding two stimuli of Type Ia with definite direct objects and two with indefinite direct objects, and similarly for Type Ib. Since simple sentences of Type I are fairly innocuous, a second list (List B) of eight Type II sentences was constructed in which the verb-particle construction appeared in an infinitive form, such as in sentences (2a, b). Here again the definiteness of the direct object NPs was controlled.

The third list (List C) consisted of simple sentences of Types III and IV, with four instances of each subtype. Again, the definiteness of direct objects was controlled, so that there were two definite and two indefinite direct objects for each of the six subtypes, yielding a list of 24 stimuli. The length of PPs and RCs was controlled and ranged from four to five words. In all three lists, the subject NPs were either definite or proper nouns, and verbs were all in the third person past tense form.

Definiteness in the direct object NPs was controlled, since it seems intuitively that some decrease in acceptability obtains when the direct object is indefinite, regardless of particle position. This intuitive judgement was therefore subjected to empirical test.

The stimulus sentences in each list were randomized and were presented in written form. Beside each sentence was a nine-point acceptability scale. Subjects were instructed first to read through the first list and find the most natural and acceptable sentence. This sentence was assigned a value of '9,' the most natural end of the scale. Subjects then reread the list and found the least natural sounding sentence. This was assigned a value of '1.' By scanning the list twice and isolating the most and least natural sentences, each subject anchored his nine-point acceptability scale. He then ranked each of the remaining sentences on that list on the scale from 1 to 9 inclusive, with the relatively more natural sentences being assigned the higher numbers and the less natural ones lower numbers. When subjects had completed the first list, they then went to the second one and again anchored the scale and then rated each sentence. Finally, they went to the third list, anchored it in the same manner, and rated each sentence.

2.2 Results. The 40 sentences evaluated by each subject were first reordered according to pattern type. The raw scores were then standardized to a scale with a common mean of 5 and a standard deviation of 2 for all subjects (Ferguson 1976). Since the original subject pool consisted of both matriculation and non-matriculation students, with six students having identified themselves as non-native speakers, it was deemed crucial to determine whether or not there might be several subgroups of subjects representing more than one population. Consequently a hierarchical clustering analysis (Johnson 1967) was carried out on the subjects' scores, but this analysis revealed that only one population was represented, at least in terms of their behaviour in this particular task.

An analysis of variance was performed on the standardized scores to investigate the effects of sentence type and definiteness and the possible interactions between these two factors. The experimental design was a two-way analysis of variance with repeated measures and replications. All ten syntactic types were included in the same analysis, with each type (T) represented by four replicates (R), two with definite direct object NPs and two with indefinite direct objects. The results of the analysis of variance are represented in Table 2.

Table 2. Analysis of Variance

Source	Degrees of Freedom	Mean Square	F
Type	9	237.49	98.06**
Definiteness	1	15.63	7.58*
T x D	9	48.77	20.14**
Replicates	1	1.50	0.54
Subjects	63	0.41	
T x S	567	2.42	
D x S	63	2.06	
T x D x S	567	2.42	
Residual	1279	3.16	

'**' = $p < .001$ '*' = $p < .01$

Sentence type and definiteness were both significant, as was the interaction ($p < .001$). The Type by Definiteness interaction was quite unexpected. From a graph of the interaction it was found that the general tendency is for definite direct objects to be preferred over indefinites. The only three exceptions to this tendency, and those therefore accounting for the interaction, are Types IIa (to-V-PRT-NP), IIIb (V-NP-PRT-PP), and IVb (V-NP-PRT-RC). An examination of the mean scores of each of the sentences for these sets revealed that in each case, one of the definite direct object replicate sentences had an abnormally low score. The three aberrant replicates were:

(10) a. The warden found it easy to draw in the hiking trails. (Type IIa)
  b. The Donaldsons took their new car back with faulty tires. (Type IIIb)
  c. Mother did the bedroom over that the baby is to occupy. (Type IVb)

It is clear that the first two of these sentences are ambiguous, and it is entirely possible that subjects were giving these tokens low acceptability ratings because of the ambiguity, a factor which did not appear in the other replicates. Item (10c) is quite an awkward sentence and while perhaps not ambiguous, it still invites an interpretation in which the relative clause headed by that is somehow syntactically parsed as the object of the preposition over, analogous to (10d):

(10) d.   Mother did the bedroom over that big porch.

Whatever the precise reason for the low acceptability of (10c), however, the fact remains that the interaction of Type by Definiteness is attributable to precisely three replicates in the stimuli, and accordingly, one is tempted to conclude that the interaction is a product of those replicates and not of the syntactic property of definiteness in general. In what follows, we will assume this to be the case and proceed under the assumption that the tendency for definite object NPs to be preferred is a general one.

In order to assess the predictions of each of the hypotheses against the data, planned comparisons were carried out using the means for each type. The following results obtained.

1. Those types in which the particle was placed immediately after the verb were judged significantly more natural and acceptable than those in which the particle was displaced from the verb ($F(9,255)=$ 547.48, P $<.01$). This result clearly refutes the Free Position Hypothesis.

2. Within the six types with the particle displaced from the verb, Type IVc, which has the particle placed after a relative clause, was judged significantly less acceptable than the other five types ($F(5,255)=82.54$, $p<.01$).

3. Within the five types with the particle displaced from the verb, but excluding Type IVc, structures with the particle immediately after the direct object but before a postnominal modifier were judged significantly more acceptable than those with no postnominal modifier and also more natural than Type IIIc, which had the particle positioned after a final PP ($F(4,255)=107.51$, $p<.01$). Another way of stating this result is that among the structures with a displaced particle, the ones with a final particle were less natural than those in which the particle was not final, suggesting the possibility of a prescriptivist strategy of 'avoiding a final preposition.'

Since the experiment was conducted in terms of four distinct types of sentences, it is useful to represent the results of the planned comparisons in terms of each type. These general results are represented in Table 3, from which conclusions can be drawn as to the hypotheses being tested.

Table 3. Experimental Results

Type	Results
I	Ia > Ib
II	IIa > IIb
III	IIIa > IIIb > IIIc
IV	IVa > IVb > IVc
IIIc, IVc	IIIc > IVc

'>' = 'is significantly more acceptable than'

3. Discussion and Conclusion. The results clearly indicate that the Free Position Hypothesis is refuted. This result is quite in accord with the intuitions of the scholars cited above. It is probably safe to say that few, if any, linguists would argue in support of free position for the particle, although when the distinction between grammaticality and acceptability is not carefully drawn, one can be easily led into concluding that some formally defined notion of grammaticality must be equated with native speaker intuitions as to acceptability and naturalness.

As pointed out above, the only place in the structures under consideration here where the Distance and Complexity hypotheses make different predictions is in terms of Types IIIc versus IVc. So long as the PP and RC lengths are held constant, Distance predicts no difference, while Complexity predicts that IVc should be less acceptable than IIIc. It is clear from the results that the simple distance, as measured in number of words, is not the determining factor. In this crucial case, Distance is refuted and Complexity is supported.

In summary, the results of the experiment indicate that the syntactic property most relevant to the determination of subjects' acceptability judgements on the verb-particle sentences is one of the intervening syntactic complexity between the verb and particle, although it must be borne in mind that this result is based on a forced differentiation among sentence types which differ in relative acceptability. Accordingly, care must be taken not to generalize the result too freely, and especially not to cases in which judgements are based on free judgements, without supporting empirical evidence.

At this point, two major questions remain to be addressed. The first is simply: Why should the structural complexity of material intervening between the verb and its associated particle have any bearing on relative acceptability? The second is: Why should definite direct

object NPs tend to be preferred over indefinite ones?

Answers to these questions appear to lie beyond the specific syntactic properties of English, and indeed beyond the specific hypotheses evaluated above. Tentative answers can be found in the kinds of discourse and processing strategies (Clark and Clark 1977) that speakers employ in language comprehension and production. In particular, an answer to the first question can be found in the very general 'Anti-Interruption' strategy suggested by Bever (1970) and formulated by Slobin (1973) and Sheldon (1977). This strategy simply states that any unit (clause, phrase, etc.) which is internally interrupted is more difficult to process, and thereby less acceptable, than a similar unit which is not interrupted. More generally, the Anti-Interruption strategy seems to be a special case of a Closure strategy (cf. Bever 1970; Prideaux and Baker 1982), which states that while processing a particular unit, the hearer attempts to obtain closure on that unit as soon as possible. Such a strategy is useful in explaining, for example, why extraposed clauses are intuitively more acceptable than non-extraposed ones, as in (11):

(11) a.   That for John to win the race is easy is obvious.
     b.   It is obvious that it is easy for John to win the race.

The Closure strategy is likely also the reason that sentences with center-embedded relative clauses are generally less frequent and are judged less acceptable than those with final relative clauses (cf. Prideaux 1980; in press). Clearly, if the interrupting material is itself relatively highly structured, as a relative clause must be, the hearer has more processing to carry out than if the interrupting material is less highly structured, as in a simple prepositional phrase. Accordingly, it would appear that the Complexity hypothesis is not itself the final determining factor in the verb-particle structures, but rather is a result of a more general cognitive processing strategy.

The answer to the second question, dealing with subjects' preference for definite over indefinite direct objects may also lie in a general processing strategy associated with the often observed tendency for old or given information to be associated with definite NPs and new information with indefinite NPs (cf. Givon 1979). In particular, it appears that for sentences within a discourse and having a linguistic context, English exhibits a strong tendency for subject NPs to be definite and given, while this is less the case for direct object NPs. However, when sentences are presented in isolation there is no context, and consequently subjects are expected, and naturally tend, to embue the sentences with meaning. This suggests that they must create a context, perhaps quite unconsciously, in which the sentence is meaningful. Yet since the sentence contains NPs, and the sentence is the focus of attention, it is quite natural to assume that the NPs in the sentence are given rather than new information. Indeed, it is plausible to speculate that for sentences in isolation, definite NPs are in general preferred

over indefinite ones for this very reason. In fact, there is empirical evidence in support of this speculation. Prideaux and Baker (1982) found that for sentences containing relative clauses in a variety of positions, and with subject and direct object NPs varied systematically according to definiteness, those sentences with definite subject and direct object NPs were preferred over all other combinations.

In conclusion, it appears that the Closure and Given-New strategies underlie the results reported here. It is important to recognize, along with Clark and Haviland (1974), that purely syntactic factors alone do not serve to explain psycholinguistic results, but rather that such factors arise from more general cognitive aspects of the human mind. It is in that domain where explanatory principles and factors must be searched out.

NOTES

1. This article is based in part on the first author's M.Sc. thesis (Hunter 1981). We are grateful for the comments and clarifications suggested by our associates at the University of Alberta as well as for the very useful suggestions of an anonymous JAPLA referee. All errors are our own.

2. Fraser (1976) noted that since idiomatic transitive verb-particle combinations exhibit different possibilities of particle placement, each can be characterized according to a 'Frozenness Hierarchy' such that idioms can range from those which permit no 'distortion' to those allowing a full range of particle placements.

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