THE EFFECTS OF TASK, TIME, AND RULE KNOWLEDGE ON GRAMMAR PERFORMANCE FOR THREE ENGLISH STRUCTURES

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Introduction

This paper reports on a task variation experiment using a repeated measures design to investigate the effects of time, task, and rule knowledge on the performance of three English structures by non-native speakers of English. The design and procedures used are similar to studies by Hulstijn and Hulstijn (1984), Tarone (1985b, 1982), and Bialystok (1982).

MANOVA and ANOVA analyses indicate time had a significant effect on performance for two oral production tasks. Four tasks (2 oral and 2 written) ranged from more "automatic" to less automatic or "controlled" (see Chaudron, 1985 for a discussion of task types). Tasks 1 - 4 elicited significantly different performance levels. Task 5, rule knowledge (full, partial, or none at all), had a significant correlation with only one of the four other tasks.

Previous Research

Research in interlanguage variability has evolved rapidly over the past few years. Seliger (1979) investigated the relationship between rule knowledge for indefinite articles and performance and found no significant relationship between

non-native speakers (NNSs) who could state rules for the indefinite articles compared to those who do not know the rule in terms of target-like performance. Seliger's conclusion was that rules may function as facilitators of acquisition, but not as monitoring devices, thus contributing to the notion that 'rule knowledge' may be distinct from the performance aspects of language processing.

Huebner's (1983) longitudinal study of a Hmong speaker over a period of one year provides some insights into the relationship between rule knowledge and performance. Huebner attributes variation in performance over time to the learner constantly reviewing and updating his/her rule hypotheses. These hypotheses are sensitive to the context of utterances in which the rule applies. As a result, when learners deal with different contexts, their rule application alters performance. Alteration may take the form of overuse, i.e., applying "their" rule in all contexts, or underuse, i.e., reducing the application of a rule until their hypothesis about that rule is refined or another one is devised. If such a process does indeed occur, it explains performance variation to some degree, but does not explain the underlying process(es) responsible for that variation.

Monitoring, apart from rule knowledge, has been investigated by Tarone (1979, 1983, 1985b). Tarone sees interlanguage variability resulting from differing amounts of attention learners pay to speech. This notion is best represented on a continuum of 'styles' within one grammar system. At one end of the continuum is the "careful style" which is characterized by language produced in environments where the learner is paying the

most attention to language. The other end of the continuum is the language produced when learners are paying the least attention to grammar form, or "vernacular style". Tarone (1983) hypothesized that accuracy would increase as tasks require more attention to language form. This assumption is the basis for her 'chameleon' explanation of interlanguage variability.

Tarone (1983, 1985b) reports a study in which 20 subjects performed 3 tasks designed to elicit different speech styles representing positions on a continuum from a careful to a vernacular style. Performance on 4 English grammar forms: 3rd person singular, article, plural S, and 3rd person direct object pronouns, was compared across tasks.

The three tasks were sentence correction, oral narration, and an oral interview. The first task, which involved starring erroneous sentences and writing in corrections, was assumed to require the most attention to language form. Task 2 entailed subjects telling a story clearly enough for a native speaker to correctly arrange a sequence of pictures. This story telling task was considered to require the least attention to form. Task 3 was considered to be intermediate in terms of attention to form and consisted of an oral interview conducted by a native speaker.

Tarone hypothesized that systematic variability would be evidenced if the accuracy level of the target forms changed between the oral tasks (Tasks 2 and 3). This change would be attributable to specfic constraints of the task. Variability in article use was significantly different between these two tasks. However, no difference was found for plural-S. A second

hypothesis, that performance on Task 1 would vary from performance on Tasks 2 and 3 was supported; yet, plural S showed no variation across the three tasks. Article performance was lower on Task 1 than on Task 2 or 3.

The results led Tarone to reevaluate the notion that grammatical accuracy would increase as task focused on form. She examined the function of the article and its role in the three tasks. She attributes the variation in target-like performance on article to the article's cohesive function in a narrative or interview (Tasks 2 and 3). Cohesion was not so much an issue in the isolated sentences of Task 1, thus providing fewer cues for correct article use.

> "In short, there is a sort of inverse relationship in the study between the degree of attention to language form required by a task, and the cohesiveness of the discourse elicited by that task" (1985b:13).

Bialystok (1982) takes a slightly different approach to the sources of interlanguage variability. Instead of differences in style, or under and overuse of rules, Bialystok attributes variation in performance to the effects of cognitive, linguistic, and social demands placed on the learner. Performance is dependent on the learner's ability to meet those demands in different situations. Bialystok recognizes two control dimensions: an analyzed factor, which is characterized by a learner's awareness of a structure in his/her knowledge and the ability to transform and manipulate that structure. Unanalyzed knowledge is characterized by the learner's potential ability to manipulate knowledge, but the learner has no awareness of a structure in that knowledge. For example, a learner who could

form a correct sentence and offer an accurate grammatical explanation of that sentence, could be said to exhibit 'analyzed knowledge'. A learner who could form a correct sentence but not offer any conscious rule knowledge, could be said to exhibit 'unanalyzed knowledge'.

A second factor in Bialystok's control dimension is labelled the automatic factor. Automaticity is described as the access a learner has to knowledge. Access here is defined as the effectiveness of a learner's retrieval system under different conditions. Bialystok suggests the aspects of the control dimension are hierarchical according to "markedness". Analyzed knowledge is marked over unanalyzed knowledge and automatic control is marked over non-automatic control. She predicts the unmarked forms will precede the marked forms.

In two experiments this notion was investigated in terms of performance on six English structures. It was hypothesized that a hierarchy of knowledge would conform to the demands made by different tasks. A hierarchy would be evidenced if performance levels increased on "marked" forms rather than "unmarked" forms. This distinction creates a model (Bialystok, 1982) in which a qualitative view of learner knowledge rather than a quantitative one is suggested. In other words, what a learner is able to do with various levels of knowledge is the underlying factor of performance accuracy in different situations.

Bialystok's (1982) study supports the notion that tasks requiring unanalyzed knowledge will be performed equally well by both advanced and intermediate learners, but tasks requiring

analyzed knowledge will be performed accurately only by advanced learners. Bialystok's concerns turn to the point at which learners without analyzed knowledge will be constrained by task demands. Bialystok hypothesizes:

> "Learners...should begin with an ability to solve tasks not requiring marked information, gain control over tasks requiring information marked on one factor only, and finally, we expect, will master those tasks for which marked information is required in both factors" (1982:199).

The point is that having rule knowledge does not of itself necessarily mean learners have the ability to use a given rule in tasks requiring different types of manipulation of that rule. Bialystok's work supports Huebner's (1983) findings and provides a possible explanation for Seliger's (1979) results.

Additional constraints on performance were examined by Hulstijn and Hulstijn (1984), who looked at performance on two Dutch word order rules under the constraint of time pressure and focus on attention. Rule knowledge is said to be a part of a metalinguistic domain which Hulstijn and Hulstijn hypothesized would not be related to performance. This hypothesis was borne out in their findings. That focus on form would increase performance for the two word order rules was also supported. However, the presence or absence of time pressure had no significant effect on subject performance.

Results from these recent studies complement each other in that generally, tasks focusing on form tended to produce higher levels of accuracy than those not focusing on form. Whether or not a learner has metalinguistic knowledge of a particular rule, does not seem to effect performance significantly.

The Study

Following Chaudron (1985), the goal of this research is to provide replicable measures and procedures for reliable interlanguage data elicitation. To do this, several of the issues raised in the research outlined above are invesitgated, namely: the effects of task (Tarone, 1985a&b) time, and rule knowledge on grammar performance (Hulstijn and Hulstijn, 1984) for three English structures: Plural-S, Article (a/an/the), and Relative Pronoun Marker (who, whom, that, which, when). By using similar materials and methods found in Tarone (1985a&b) and Hulstijn and Hulstijn (1984), this study attempts to provide data on interlanguage variability in which controls and conditions are consistent with other research. Task constraints are modelled after Tarone (1985a&b). Hypothesis have been generated on the basis of Hulstijn and Hulstijn's (1984) results.

Method

The following hypotheses are investigated: Hypothesis 1: Time will have no effect on grammar performance between Task 1 and Task 2. Hypothesis 2: rule knowledge will have no effect on performance across tasks whether it is exhibited fully, partially, or not at all. Hypothesis 3: Grammar performance on the three dependent variables will increase as tasks require more controlled processing.

Subjects:

18 Ss took part in the experiment. The Ss were attending an intermediate Academic Listening Comprehension course in the English Language Institute (ELI) at the University of Hawaii,

Fall 1985. Ss were placed in the class as a result of scores on the ELI placement exam (3 auditors were included in the study who had not taken the placement exam). There were 10 females and 8 males with a mean age of 26 years and a mean length of residence of 2 1/2 years. Half the group (9) were native speakers of Chinese (4 Cantonese, 5 Mandarin and Cantonese), while the other half was made up of 3 native speakers of Korean, 2 Japanese, 1 Thai, 1 Ilocano, 1 Indonesian, and 1 Vietnamese. The cultural background of the Chinese language group was varied: 4 were from the Peoples' Republic of China, 2 from Taiwan, 2 from Hong Kong, and 1 from Vietnam. (10 of the 18 Ss had taken the TOEFL. Their scores ranged from 490 to 557).

Tasks:

Four tasks involved the imitation, dictation, or grammar correction of equivalent sentences (i.e., sentences of approximately equal syllable length and syntactic complexity). The fifth task required the Ss to write out explicit grammar rules and provide examples for the three structures dealt with in the experiment. Tasks 1 & 2 (elicited imitation (EI): -time -repetition +oral +aural vs. +time +repetition +oral +aural) are considered to tap the automatic processing realm, Task 3 (dictation: +time +aural +writing) is considered to lie between the automatic and controlled realms. The controlled realm is represented by Task 4 (grammar correction: +time +writing +reading -oral -aural), and Task 5 rule statement: +explicit knowledge, +writing).

Materials:

Equivalent sentences were selected from Azar's (1981) Understanding English Grammar; Danielson and Hayden's (1973) Using English; and Frank's (1972) Modern English Part II for their representation of the three target structures. 162 sentences with at least 1 obligatory instance of a target structure were chosen and, if necessary, modified to be 11 to 15 syllables in length. The sentences were divided into three target structure groups of 40 sentences each. From these three target structure groups, sentences were randomly assigned to one of the 4 tasks: Task 1 (EI Minus Time); Task 2 (EI Plus Time); Task 3 (Dictation); and Task 4 (Grammar Correction). Tasks 1 to 3 then consisted of 10 correct sentences from each structure group yielding 10 obligatory instances per structure per task for a total of 30 target items in a given task. Each sentence contained only one scored item. The sentences were randomly assigned to one of the four tasks.

For Task 1, each sentence was recorded in Standard American English at 148 wpm without repetition. A sentence number preceded each sentence and there were 15 seconds between sentences. Ss orally imitated the sentence into their headset microphone and recorded it in the 15 second gap between items. A different set of equivalent sentences was recorded by the same speaker for Task 2 (127 wpm), but with 2 repetitions 1 second apart, and 30 seconds between sentences (again, Ss recorded the sentences they heard). Task 3 was recorded with the same constraints as Task 2 (since this was dication, Ss did not imitate orally, but wrote the target sentence on paper).

Task 4 did not involve recording and Ss had 45 minutes to complete it. Five sentences from each structure group were altered to form a grammatically incorrect sentence, the error being the scored obligatory instance of one of the three grammar forms. Five sentences were left unaltered. Ss were given 30 sentences and told that some of the sentences may have one and only one grammatical error. Ss were allowed to add/delete a word or letter, but not to change the word order or add/delete more than one word or two letters. Ss were to read the sentence and write only the correction on a line underneath the error (following Tarone, 1985b).

For Tasks 1 through 4, three practice items were performed with the experimenter providing feedback. The practice items were not scored.

Task 5, (Explicit Rule Knowledge) required the Ss to write out the rule for each of the 3 target structures and provide original example sentences of those forms. Ss were prompted with the rule name and an example of the item. A rule statement and example was supplied by the experimenter as a practice item. Ss were given 45 minutes to complete the task.

Procedure:

In a pilot session, a native speaker of English as was able to perform each task accurately. Tasks 1 - 3 were performed in a language lab Ss were familiar with. Prompt sentences were played over Ss individual headsets. Ss recorded their responses on individual cassettes through headset microphones for Tasks 1 and 2 (+aural, +oral, +/-time respectively). Task 3 (+aural,

+writing) was carried out in the lab for aural quality. Task 4 (+reading, +writing, +time, +focus on grammar) was carried out in the Ss' regular classroom.

All tasks were conducted during the Ss' regular classtime with 1 to 2 days between each task. Tasks were presented in consecutive order beginning with Task 1 and ending with Task 5. (Any S absent or excused from class made up the task in a private office with the experimenter present only to go over the practice items. This procedure also applied to several Ss who experienced tape malfunctions during Task 2: EI Plus Time).

Scoring:

The data consist of the results on 4 performance tasks of 10 obligatory items each for 3 structure rules: Plural-S (concrete count nouns); article (a, an, the); and relative pronoun markers (who, whom, that, which, when) totaling 120 scored items. Task 1 and 2 (taped oral data) were scored by the experimenter for realization of the pre-selected target items only. If a S produced the item only once in the time allowed, a point was awarded for that production regardless of the number of incorrect attempts. 2 separate scoring periods were carried out by the researcher on the taped data and any discrepancies were averaged. Tasks 3 and 4 were scored by the experimenter with a pre-established answer key. Only exact answers were scored as correct. (Targets in Tasks 1 - 4 were mixed in terms of sentence location as much as possible between the 1st, 2nd, and 3rd portions of each sentence for all scored forms). Task 5 was judged in accordance with a pre-set rule statement for each

target structure adapted from Azar (1981) and Danielson and Hayden (1973).

Analyses and Results

All statistical procedures (MANOVA, ANOVA, Oneway, Pearson Correlations) were calculated using SPSSx User's Guide, (Norusis, 1985) on the Univeristy of Hawaii's IBM 3081 computer.

In order to support the assumption that the aural Tasks (Tasks 1, 2, and 3) had some commonality with each other a Pearson correlation was calculated yielding the coefficients in Table 1. As expected, the non-aural grammar task (Task 4) was not significantly correlated with any of the tasks, while Tasks 1, 2, and 3 correlated at $p < .01$. Task 5 (grammar knowledge) did not correlate with tasks 1, 3, or 4, but

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Table 1 about here
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did show a significant ($p < .05$) correlation with Task 2. A possible reason for this correlation may be due to the increased amount of time present in each task.

A multivariate a priori contrast between Task 1 and 2 yielded a t-test value of $t = -3.12$ ($df=15$), which is significant ($p < .01$). The comparison of means between the two tasks indicates time had a significant effect in favor of Task 2. Hypothesis 1 (a null hypothesis), that Time would have no effect on Tasks 1 and 2, is therefore rejected.

Hypothesis 2, that rule knowledge would have no effect on performance (in Task 5) is partially supported in the non-significant correlations shown in Table 1. Task 5 does not

correlate significantly with Tasks 1, 3, or 4. There is, however, a significant relationship between Task 5 and Task 2. As mentioned earlier, this may have been due to the amount of time alloted and the saliency of the target items in the two tasks.

Hypothesis 3, that correct grammatical performance on the forms would increase as tasks required more controlled processing, was not completely supported. Figure 1 shows the plotting of the mean scores across tasks by grammar type (i.e., Plural-S, Article, Relative Pronoun Marker). The results indicate Plural-S supports the hypothesis, but article does not. Relative pronoun marker is consistent with the hypothesis for Tasks 1 - 3, but not for Task 4. Table 2 lists the means and standard deviations by task for each grammar type. (Means for Task 5 are not presented here because the task demands were very different from those of Tasks 1 - 4 and the scale in Task 5 was based on three instead of ten).

Figure 1 about here

Table 2 about here

However, as can be seen in Table 3, which reports the results of the Multivariate ANOVA with a repeated measures design, 'Grammar Type' had a significant effect across tasks, as did Task and Task by Grammar Type. In other words, the means for Grammar Type and Task were significantly different, as were the means for each type within tasks. Table 4 shows the overall means for the

Grammar Types. The relative pronoun marker received the highest overall mean, followed by article, and plural S.

Tables 3 & 4 about here

Significant differences were found for each task separately as shown in Table 5. The variation between cells for Grammar Type yielded an F (df 2/34) = 5.536, $p < .01$. Article performance was significantly higher than performance on Plural-S for Tasks 1 - 3, but no differences were found for article and relative pronoun marker (see Table 5).

Table 5 about here

Three oneway ANOVAs and post hoc contrasts tested the effect for the individual Grammar Types (Plural-S, Article, and Relative Pronoun) by Task. Results are presented in Table 6. The Mean Square reported in the computation is the Mean Square derived from the pooled variance in the MANOVA procedure. Total performance on Task 1 was worse than total performance on Tasks 2 and 3. However, performance on Task 4 was worse than Task 3. Hypothesis 3, then, is only partially supported.

Table 6 about here

A Tukey multiple range test at the $p < .05$ level of significance shows that performance on Plural-S was significantly different between Task 1 and Task 4 (see Figure 1). Performance on Article in Task 4 was significantly different from Tasks 1, 2, and 3. Performance on Relative Pronoun Marker in Task 1 was significantly different from Task 3; and Relative Pronoun

performance in Task 4 was also significantly different from Task 3 as well. Other relationships were not significant. Table 7 reports post hoc analyses for the differences between means for Grammar Type on each task. Significant pairs (at $p < .05$) are indicated by *. In Task 1, Article and Relative

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Table 7 about here

Pronoun Marker are significantly different from one another. For Task 2, relative pronoun marker is different from plural S, as it is in Task 3. In Task 4, plural S and relative pronoun marker are significantly different from article performance. And in Task 5, plural S is significantly different from relative pronoun marker performance.

Discussion

Hypothesis 1, that Time would not have a significant effect on performance between Task 1 and 2, was rejected. This may have been due in part not only to the amount of time given for Task 2 (15 seconds more), but also to the extra repetition of the sentence Ss received. The extra repetition together with the extra time may have served to enhance the Ss' performance rather than Time alone.

Hulstijn and Hulstijn (1984) report no significant effect for Time in a story retelling task. No real comparisons can be made between the effect for time in the present study, and the lack of effect for time in the Hulstijn and Hulstijn study due to the non-equivalent nature of the tasks in the two studies. To

help clarify the issue of a time factor, a more exact replication of Hulstijn and Hulstijn study is needed.

Hypothesis 2, that no effect for rule knowledge would be found across tasks, seems to be supported (see Table 1). This supports Seliger's (1979) finding regarding indefinite articles and rule knowledge. Huebner's (1983) notion of variable learner rule hypotheses could also be an explanation of this sample group's performance. In addition, Hulstijn and Hulstijn's (1984) hypothesis that rule knowledge would have no significant effect is supported by the present results. In terms of Bialystok's (1982) study, the status of Hypothesis 2 may reflect the Ss' status as "intermediate" learners dealing with tasks requiring analyzed knowledge. However, Task 5 differed enough from the other tasks in what it called on the Ss to do to possibly eliminate it from comparisons with the other 4 tasks. The 'unguided' format may not have allowed enough instruction or prompting for the Ss to fully indicate their knowledge of the rules).

Hypothesis 3, that grammar performance for the 3 dependent variables will increase as tasks require controlled processing, is not supported. The Relative Pronoun Marker provided the strongest indication of support, but fails in Task 4 (see Figure 1). Plural-S supports Hypothesis 3 for Tasks 1, 2, and 4, but fails in Task 3. Article is the most variable of all in terms of any steady increases related to task requirments.

Explanations for these results are difficult to come by. One possibility for the high Article performance on Task 1 could be that it is a fairly routinized form and "easy" or salient for

imitation. As more attention is focused on grammar, the Ss' interlanguage rule for Article may begin to interfere with the unanalyzed system and cause a poorer performance. This would explain the drop in Article performance from Task 1 to Task 4 (Tasks 2 and 3 seem to be equal). Plural-S on the other hand, being an "easier rule" shows an increase in performance when Ss focus on form. This may indicate the rule's status as an "analyzed" rule in the Ss' knowledge system re Bialystok. Performance on Relative Pronouns improved across Tasks 1 to 3, but dropped off in Task 4. This may be due to the apparent aural saliency of Relative Pronoun Markers in the elicitation and dictation Tasks 1 - 3; whereas in the grammar correction task (Task 4), the marker lost its aural saliency thus requiring Ss to focus on grammatical relationships. Another explanation (Ed Klein, personal communication) may be that different types of Relative Clauses require different degrees of knowledge than others (subject clauses vs. object clauses for example).

Therefore, a possible explanation for the varying performance levels of these three grammar forms may have to do with the "difficulty" of each rule; i.e., Task alone (as Tarone (1985) and others suggest) may not be the sole cause for variability. For example, when a learner focuses on grammar, "easy" rules may be reflected in high accuracy levels, while more difficult or more complex rules would be reflected in low accuracy levels. Different types of processing (as Bialystok 1982 suggests) for different rules may work in unison with task to exhibit variability.

In this study, the performance on Task 4 would indicate that Plural-S is easier than Relative Pronoun Marker, and Relative Pronoun Marker is easier than Article when Ss focus on form. Tarone (1985b) suggests Article performance is related to cohesion, but in this study, all tasks consisted of isolated sentences and Article performance was lowest when Ss focused on form.

Conclusion

Task variation and interlanguage variability are complex issues. The results of this study suggest that Time as a processing constraint has an effect on performance. Tasks which focus on grammar may result in interlanguage variability not only due to the effect of task, but also due to the potential factor of rule type and the constraints it places on language processing. Further research on the effect of rule type is needed to clarify this issue.

Notes

[1] The author wishes to acknowledge Craig Chaudron and Graham Crookes for their invaluable assistance on earlier versions of this paper.

[2] Copies of Tasks 1 - 5 may be obtained from the author: Department of ESL, University of Hawaii, 1890 East-West Rd. Honolulu, HI 96822.

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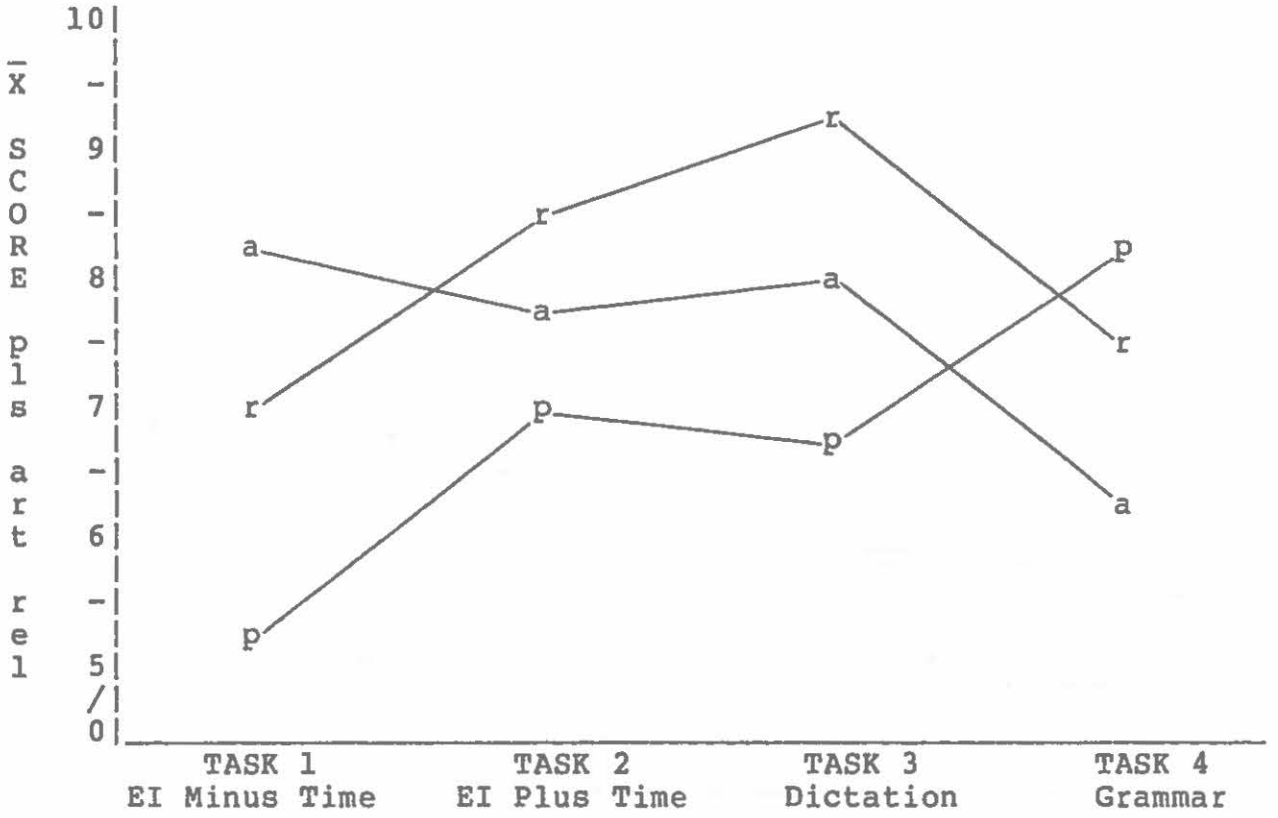
TABLE 1
Pearson Correlations Between Tasks

TASK	1	2	3	4	5
1 EI Minus TIme	1.0	.755***	.689**	.284	.188
2 EI Plus Time		1.0	.683**	.046	.506*
3 Dictation			1.0	.459	.165
4 Grammar				1.0	-.019
5 Rule Knowledge					1.0

*p < .05
**p < .01
***p < .001

FIGURE 1
Grammar Means Across Tasks



p = Plural S a = article r = relative pro

TABLE 2
Grammar Type Means for Tasks 1 - 4

Task	Type	$\bar{X}$	S.D.
Task 1	Plural S	5.333	2.910
	Article	8.166	1.504
	Relative Pro	7.111	2.494
	Total:	20.611	5.403
Task 2	Plural S	6.944	2.312
	Article	7.888	1.875
	Relative Pro	8.444	2.035
	Total:	23.277	5.233
Task 3	Plural S	6.777	3.227
	Article	8.0	2.029
	Relative Pro	9.166	1.043
	Total:	23.944	5.034
Task 4	Plural S	8.388	1.036
	Article	6.333	1.328
	Relative Pro	7.5	1.653
	Total:	22.222	2.624

TABLE 3
Effects of Task, Grammar Type, & Task by Grammar Type

Multivariate Table

Effect	df	Wilks	Hotellings T^2	F
Task	3/15	.532	.878	4.39*
Grammar Type	2/16	.584	.71	5.68*
Task by Grammar Type	6/12	.138	6.229	12.46***

*p < .05
***p < .001

TABLE 4
Total Means for Grammar Type Across Tasks 1 - 4

Grammar Type	$\bar{X}$	S.D.
Plural S	27.444	7.493
Article	30.389	5.326
Relative Pro	32.222	5.364

TABLE 5
Effect of Grammar Type for Task Level

Multivariate Table

Effects	df	Wilks	Hotellings T^2	F
Grammar Effect Task 1	2/16	.467	1.136	9.095*
Grammar Effect Task 2	2/16	.685	.459	3.674*
Grammar Effect Task 3	2/16	.427	1.341	10.73**
Grammar Effect Task 4	2/16	.392	1.547	12.383**

TABLE 5 (Continued)
Effect of Grammar Type for Task Level

Grammar Effect Task 5	2/16	.571	.75	6.0*

Univariate Table

Effects	df	F ratio
Grammar Type pls vs. art	1/17	9.991**
Grammar Type art vs. rel	1/17	.215

*p < .05
**p < .01

TABLE 6

ANOVA for Grammar Type Pls by Task

Source of variance	SS	df	MS	F
Between groups	84.277	3	28.092	4.439**
Within groups	430.333	68	6.328	

**p < .01

ANOVA for Grammar Type Art by Task

Source of variance	SS	df	MS	F
Between groups	39.041	3	13.013	4.463**
Within groups	198.277	68	2.915	

**p < .01

ANOVA for Grammar Type Rel by Task

Source of variance	SS	df	MS	F
Between groups	46.555	3	15.518	4.374**
Within groups	241.222	68	3.547	

**p < .01

TABLE 7
Input Matrix
Mean Grammar Score by Grammar Type for Each Task

Task 1	pls	rel	art
	5.3	7.1	8.1
pls			
rel	*		
art	*		

*p < .05

Task 2	pls	art	rel
	6.9	7.8	8.4
pls			
art			
rel	*		

*p < .05

Task 3	pls	art	rel
	6.7	8.0	9.1
pls			
art			
rel	*		

*p < .05

Task 4	art	rel	pls
	6.3	7.5	8.3
art			
rel	*		
pls	*		

*p < .05

Task 5	rel	art	pls
	6.0	6.3	7.3
rel			
art			
pls	*		

*p < .05