TAKE CARE OF THE SENSE AND THE SOUNDS WILL TAKE CARE OF THEMSELVES.

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The objective of the experiment reported in this paper is to provide evidence of the difference in language performance between first language (L_1) speakers of English and second language (L_2) speakers of English in utilising Stress, Rhythm and Intonation (S. R. I.) cues to disambiguate utterances presented out of context.

The paper shows that L_1 speakers of English consistently, if not invariably, respond to the S. R. I. cues of English, while L_2 speakers do not; and it is suggested that teaching techniques based on meaningful distinctions may be more effective than pure imitation in teaching L_2 speakers to use the S. R. I. patterns of English for both reception and production.

Background to the Experiment

In the last ten years a great deal of work has been done on establishing the nature of the relationship between sense and sound, work that has centred upon the relationship between S. R. I. and syntactic structure. Most of this work has been related to competence studies i e the intuitions of a native speaker about his language, rather than performance i e reaction to overt data. One of the problems faced by those working in this field has been that the researcher's internalised knowledge is his reader's overt data, and the reader's performance-based response often fails to confirm the original insight, without of course necessarily invalidating it.

The starting point for those studies most closely related to the experiment reported here has been summed up by Philip Lieberman as follows: "Intonation can furnish different meanings to utterances that have the same words by grouping the words into different blocks which direct the listener's recognition routines towards one underlying phrase marker rather than another " *[1] Unfortunately (from a tidiness point of view at least), this is not the whole story Lieberman has shown that the listener may use his internalised grammatical knowledge of the language to impose a S. R. I. pattern upon an utterance, which is not apparent in the acoustic signal itself. *[2] The more complex position was stated by Chomsky and Halle as follows: "The hearer makes use of certain cues and certain expectations to

determine the syntactic structure and the semantic content of an utterance ... he will 'hear' the phonetic shape determined by the postulated syntactic structure and the internalised rules." *[3] Here I take 'certain cues' to include S. R. I. cues in the acoustic signal, and 'certain expectations' to refer to the context in which the utterance is heard.

British linguists, those who have followed Firth, and in particular M.A.K. Halliday, have consistently emphasised the importance of context. They have maintained that language does not exist outside a situation of some kind which influences it. It follows that where no context exists, the listener must make an assumption concerning the context as part of his decoding process

Halliday sees S. R. I. cues as indicating probability: "as regularly with intonation choices, there is a probabilistic correlation but the choice remains "*[4] Jan G Kooij expresses the notion of probability rather differently: "It is plausible, as far as actual speech is concerned, to assume that disambiguation is always a matter of computing the probabilities over and against the phonetic cues .." *[5] and later "It is well known that native speakers have in general no difficulty in assigning different functions to phenomena that, phonetically, are quite similar in nature. (This) means that on occasion, such functions may be very hard to discriminate in one particular sentence." *[6]

The experimenter working on the disambiguation (by means of S. R. I. cues) of utterances presented out of context is therefore somewhat at the mercy of his subjects' uncontrolled expectations and/or inventive powers.

Introduction to the Experiment

The study departs from general practice in applied linguistics in two ways: firstly by contrasting the learner's "approximative system"[7] of the L_2 with the native speaker, rather than contrasting the learner's mother tongue with the target language, and secondly by studying performance rather than competence.

Little contrastive analysis has been done on the S. R. I. systems of different languages, and from the point of view of language teaching, little would be achieved by such studies. Despite the undeniable influence of the stress and rhythm patterns of the learner's L_1 in his L_2 speech, the overall approximative system of the learner (I am thinking here particularly of L_2 English speakers in P. N. G.), seems obviously different from that of any L_1 even to a casual listener, being characterised by a lack of pitch contrasts and vocal "colour" generally

This observation is in line with the increasingly widely held belief that 'error' or

deviation from the L_1 speaker's norm in the target language does not result solely or even primarily from carrying over the habits of the mother tongue into the L_2 but that errors are rather "signs of false hypotheses" *[8] similar to those made by a child learning his L_1, and that the making of such errors "is an inevitable and indeed necessary part of the learning process."*[3]

Past studies have also tended to contrast the learner's performance with that of an idealised native speaker i.e. with a competence model, a procedure which inevitably leads to ineffectual over-teaching. It is assumed here that it is only by first establishing the nature of the operation of language rules in the performance of native speakers that we can determine how best to make L_2 performance approximate to that of the L_1 speaker.

Another good reason for contrasting the performance of L_1 speakers and L_2 speakers is to establish much more clearly the kinds of disadvantage the L_2 speaker is under. As more and more people become dependent on the use of a L_2 in education, commerce and administration, any such information is likely to prove extremely valuable

Subjects

There were 37 L_1 speakers of English for Part 1 and Part 11 of the test. The fact that teachers of English and post-graduate teacher trainees formed a large part of the group makes it an unrepresentative sample, but more importantly, all the L_1 subjects knew the person who recorded the tape and were therefore familiar with his voice. This was not the case with the L_2 sample. A much larger sample of L_1 speakers is to be tested at La Trobe University

The L_2 sample consisted of 229 subjects for Part 1, and of 209 subjects for Part 11. They were upper secondary school students and post secondary school students studying at the Administrative College. These subjects' English was considered to be at or approaching advanced level, but to be sufficiently far short of complete bilingualism to throw light upon the inadequacies in the performance of L_2 speakers of English in interpreting S. R. I. cues to structural relationships in the language.

Test Items

Most sentences used in the test were taken from the literature where they appeared as examples of utterances ambiguous in written form but capable of disambiguation in speech through a particular S. R. I. pattern. The last three items test the subjects' ability to judge affective cues in the speaker's intonation.

The Method

The instructions for answering the test and the test questions were taped. The voice used on the tape has a Southern English accent. The speaker concentrated rather upon the meaning of what he had to say than on producing a particular S.R.I. pattern. It was intended that the voice should sound as natural as possible, without undue emphasis or precision. Each test item was heard by the subjects only once except for questions 33 and 34 where a short dialogue was involved. For these two questions the test items were given twice

In Part 1 there are 30 test items each of which is ambiguous in its written form, but may be disambiguated in speech by S.R.I. cues to the underlying syntactic relationships Subjects have 6 choices on their answer sheets as follows:

a)& b) give paraphrases of the alternative 'readings': e.g. 'English Teacher' may be understood to mean a) A teacher from England, or b) A teacher of English, and the subject chooses according to his understanding of what he hears.

c) Both meanings are possible

d) Neither of these meanings is possible

e) I am uncertain whether a) or b) is correct

f) I did not hear the sentence properly.

The main purpose of c), d), e) and f) was to discourage subjects from guessing. In the analysis these answers were classified as 'no choice'.

In Part 11 there are 23 test items involving 7 test units The test units consist of words, sentences and dialogues which are repeated a number of times with variations of S.R.I. The subjects again indicate their response or non-response on the answer sheet In these items the number of possible meaningful choices varies between 2 and 5, indicated by the letters a) to e). The method of indicating no choice is to enter the letter Z on the answer sheet. Detailed instructions were given on the tape for each test unit.

Results

The results for each question are given below. They are shown after each test sentence or item and the set of meaningful alternatives from which the subject can choose. The predicted choice is underlined. The L_1 responses are given on the left, the L_2 responses on the right.

The first figure given shows the number of subjects who chose alternative (a), the second, (b) etc and the last figure shows the number of subjects who made no choice. / represents a trend in the predicted direction X indicates a trend in the opposite direction. ^{o} indicates no significant trend.

In Part 11, the question item is spoken a number of times with a variety of S.R.I. patterns. The set of alternative readings remains constant with each variation, the predicted choice being different in each case. On the results sheet (below) each question item is given from the tape script once only, and is followed by the set of alternative readings. The resultant choices made by the two groups are presented as follows: the predicted choice (i.e. a), b) etc) is stated first The results are then given for the L_1 subjects: (a) N_1 (b) N_2 (c) N_3 ... (Z) N_4, where N_1 = the number who chose alternative (a), N_2 = the number of subjects who chose (b) etc. The number given after (Z) shows how many subjects either did not or indicated that they could not make a choice. The results for the L_2 group are presented in the same way The /, X and ^{o} are used as for Part 1.

The results are not presented in the order in which the variations on the test items were given on the tape. This ordering is shown by the number against the relevant paraphrase of the predicted choice.

For all items Chi-square tests were used to establish the level of significance of the difference in the response patterns of the two groups (L_1 and L_2 speakers of English) for each question.

In order to give an overall comparison between groups, the mean percentage of correct responses per question was calculated for each sample and the difference between the two means was tested for statistical significance.* [10]

To assist the understanding of the results item one is presented in detail:

TEST ITEMS & RESPONSES

PART 1

1. I drove by the signs. (test item on tape)

   a) I went past the signs - I missed them and got lost (first reading for 1 and predicted choice)

   b) I followed the signposts to the place I was going to. (second reading for 1)

L_1 23, 6 8 / L_2 65, 102, 62, X 0.1%

L_1 First language speakers of English
23 subjects chose alternative (a)
6 subjects chose alternative (b)
8 subjects made no choice.
/ trend as predicted

L_2 Second language speakers of English
65 subjects chose alternative (a)
102 subjects chose alternative (b)
62 subjects made no choice.
X trend against prediction

0.1% The difference between the two groups was significant at 0.1% Chi squared

2. I gave John what I wanted
   a) There was something I wanted but I gave it to John
   b) I wanted to give John a certain thing and I did give it to him

L_1 14, 17, 6° L_2 105, 84, 40 X Not significant at 5%

3. They don't admit any students
   a) They admitted no students
   b) They admitted a few special students.

L_1 20, 10, 7 X L_2 170, 18, 41 X 1.0%

4. She's a pretty interesting girl.
   a) The girl is both interesting and pretty.
   b) The girl is very interesting.

L_1 11, 19, 7 X L_2 105, 69, 55 / 5.0%

5. She didn't go to the doctor because she was sick
   a) She did go to the doctor and she wasn't sick.
   b) She didn't go to the doctor and she was sick.

L_1 26, 4, 7 / L_2 70, 59, 100° 0.1%

6. He washed and brushed his hair

a) He washed himself and then brushed his hair.

b) He washed his hair and brushed his hair.

L_1 16, 15, 6° L_2 112, 60, 57 / Not significant at 5%

7 I gave her dog biscuits

a) I gave some biscuits to her dog.

b) I gave dog biscuits to her.

L_1 0, 33, 4 / L_2 78, 115, 36 / 0 1%

8. Tau the crocodile is dead.

a) Tau, I must tell you that the crocodile is dead

b) A crocodile called Tau has died.

L_1 9, 23, 5 / L_2 98, 95, 36° Not significant at 5.0%

9. He only lent it to me.

a) He lent it to me He didn't give it to me.

b) He lent it to me and to no one else.

L_1 35, 0, 2 / L_2 106, 75, 48 / 0.1%

10. I like amusing guests.

a) I like making my guests laugh

b) I like guests who make me laugh.

L_1 9, 21, 7 / L_2 83, 77, 69° 5.0%

11. He has plans to leave

a) He is going to leave here and go somewhere else.

b) He has some plans and will leave them here with us.

L_1 10, 21. 6 / L_2 97, 47, 85 X 0.1%

12. He's an English teacher.

a) He teaches English.

b) He is a teacher and he comes from England

L_1 11, 16, 10 / L_2 118, 57, 54 X 5 0%

13 Old men and women often come here.

a) Only old men and old women come here often.

b) Old men, and young and old women come here often.

L_1 8, 19, 10 / L_2 168, 9, 52 X 0.1%

14. I think that man is honest

a) That particular man is honest in my opinion

b) All men are honest in my opinion.

L_1 2, 30, 5 / L_2 128, 64, 37 X 0 1%

15. He is a sweet salesman.

a) He sells sweets.

b) He is a goodnatured and plesant salesman.

L_1 7, 25, 5 / L_2 120, 54, 55 X 0.1%

16. He uses a steel cutting blade.

a) A blade which cuts steel.

b) A steel blade which cuts.

L_1 0, 34, 3 / L_2 50, 111, 68 / 0 1%

17. The teacher spoke to the boy with a smile.

a) The teacher was smiling as he spoke to the boy.

b) The teacher spoke to the boy. The boy was smiling.

L_1 33, 1, 3 X L_2 193, 11, 25 X Low expected values
Chi square meaningless.

18. There's a car behind the garage that needs paint.

a) The car needs paint.

b) The garage needs paint.

L_1 13, 18, 6 / L_2 144, 24, 61 X 0.1%

19. They were both happy and excited.

a) There were only two people.

b) There may have been more than two people.

L_1 4, 24, 9 / L_2 87, 39, 103 X 0.1%

20. We need a hot evening drink.

a) The evening was hot.

b) The drink was hot.

L_1 4, 26, 7 / L_2 26, 66, 137 / 0.1%

21. He tripped over a red paint pot.

a) The pot was red in colour.

b) The paint in the pot was red.

L_1 31, 4, 2 / L_2 70, 77, 82° 0.1%

22. He watched the dancing girl carefully.

a) The girl was dancing

b) The girl is a dancer

L_1 29, 3, 5 / L_2 103, 50, 76 / 0.1%

23. I admire his new captain's uniform.

a) His new captain had a uniform.

b) It was a new uniform. The uniform was for a captain.

L_1 15, 15, 7° L_2 45, 105, 75 X 2.0%

24. I saw him inside the dark green house.

a) The house was painted dark green.

b) The green house was dark.

L_1 3, 31, 3 / L_2 66, 100, 63 / 0.1%

25. You would do a silly thing like that.

a) Only you would do such a silly thing and you have done it.

b) You might do it if you have a chance some day even though it is silly.

L_1 28, 2, 7 / L_2 54, 94, 81 X 0.1%

26. They don't know how good meat tastes.

a) They have never tasted any meat at all.

b) They have only tasted bad meat.

L_1 3, 28, 6 / L_2 77, 69, 83° 0.1%

27. I'm always glad to meet a nice man.

a) A man who is nice.

b) A man who sells ice (or ice cream).

L_1 34, 0, 3 / L_2 142, 15, 72 / 1.0%

28. I haveason Tau who is a doctor.

a) Tau is the name of the person being spoken to.

b) Tau is the name of the son, who is a doctor.

L_1 0, 33, 4 / L_2 8, 194, 27 / Low expected values Chi square meaningless

29. It's hot today, isn't it?

a) "Isn't it?" means "You agree with me, don't you?"

b) "Isn't it?" means "Please tell me".

L_1 32, 2, 3 / L_2 154, 26, 49 / Not significant at 5 0%

30 I intend to read this paper carefully. He can sign it when I've done so.

a) "I've done so" means after I've signed the paper

b) "I've done so" means after I've read the paper.

L_1 1, 34, 2 / L_2 33, 127, 69 / 0.1%

PART II

31. We bought two hundred year old houses.

(2) a) The houses are one year old. There are two hundred of them.

(1) b) The houses are one hundred years old. There are two of them.

(3) c) There are a number of houses. They are two hundred years old.

L_1 a) - a) 32, b) 0, c) 5, Z) 0 /

b) - a) 1, b) 35, c) 0, Z) 1 /

c) - a) 5, b) 1, c) 27, Z) 4 /

L_2 a) - a) 77, b) 27, c) 82, Z) 23° Low expected values chi square meaningless

b) - a) 18, b) 120, c) 52, Z) 19 / " " "

c) - a) 48, b) 27, c) 103, Z) 31 / 5.0%

32. John gave Mary a banana at the market today.

(In each case the subject must decide which question the test sentence is answering.)

(2) a) Where did John give Mary a banana today?

(1) b) Who gave Mary a banana?

(5) c) Who did John give the banana to?

(3) d) What did John give Mary today?

(4) e) When did John give Mary the banana?

L_1 a) - a) 13, b) 4, c) 2, d) 0, e) 15, Z) 3°

b) - a) 13, b) 17, c) 0, d) 1, e) 2, Z) 4°

c) - a) 1, b) 2, c) 33, d) 0, e) 0, Z) 1 /

d) - a) 2, b) 0, c) 0, d) 33, e) 1, Z) 1 /

e) - a) 1, b) 2, c) 1, d) 2, e) 29, Z) 2 /

L_2 a) - a) 62, b) 25, c) 25, d) 41, e) 41, Z) 15° Low expected values Chi square meaningless.

b) - a) 90, b) 41, c) 18, d) 23, e) 24, Z) 13 X " " "

c) - a) 27, b) 31, c) 80, d) 25, e) 29, Z) 17 / " " "

d) - a) 34, b) 38, c) 23, d) 71, e) 26, Z) 17° " " "

e) - a) 26, b) 36, c) 35, d) 28, e) 61, Z) 23°

33. "The boss is getting a new secretary." "Who?"

(The subject decides upon the appropriate continuation of the dialogue).

(2) a) The boss.

(1) b) Mary Smith

L_1 a) - a) 36, b) 1, Z) 0 /

b) - a) 1, b) 36, Z) 0 /

L_2 a) - a) 119, b) 70, Z) 20 / 0.1%

b) - a) 58, b) 139, Z) 12/ 0 1%

34. "Where were you born?" "Port Moresby". "Where?."
(Answered as for 33)

(1) a) Port Moresby.
(2) b) Hanuabada.

L_1 a) - a) 36, b) 1, Z) 0 /
b) - a) 1, b)35, Z) 1 /

L_2 a) - a) 89, b)115, Z) 5 X Low expected values Chi square meaningless
b) - a) 74, b) 116, Z) 19 / 0.1%

35. "Ask you friend to come inside".
(The subject is asked to judge degrees of politeness)

(3) a) polite
(1) b) a request
(2) c) a command

L_1 a) - a) 20, b) 12, c) 2, Z) 3 /
b) - a) 3, b) 12, c) 11, Z) 1^{o}
c) - a) 13, b) 7, c) 14, Z) 3^{o}

L_2 a) - a) 81, b) 56, c) 63, Z) 9^{o} 5.0%
b) - a) 55, b) 60, c) 76, Z) 18^{o} 2.0%
c) - a) 57, b) 80, c) 68, Z) 4 X Not significant at 5.0%

36 "It's not bad."
(The subject is asked to judge emotive 'overtones ')

(1) a) It is good.
(4) b) It is satisfactory.

(3) c) It isn't very good.

(2) d) Some poeple think it is satisfactory, but I think it is awful

L_1 a) - a) 32, b) 1, c) 1, d) 1, Z) 2 /
b) - a) 4, b)22, c) 3, d) 4, Z) 4 /
c) - a) 0, b) 8, c) 24,d) 3, Z) 2 /
d) - a) 3, b)16, c) 4, d) 6, Z) 8 X

L_2	a) - a) 72, b) 63, c) 37, d) 28, Z) 9°	0.1%
	b) - a) 39, b) 32, c) 36, d) 61, Z) 41 X	1.0%
	c) - a) 37, b) 43, c) 54, d) 46, Z) 29°	0.1%
	d) - a) 51, b) 63, c) 59, d) 18, Z) 18 X	0.1%

37. "Yes."

(Answered as for 36).

(2) a) I agree

(1) b) Go on.

(3) c) You can't really mean "Yes?"

(4) d) I'm doubtful.

L_1 a) - a) 36, b) 0, c) 0, d) 0, Z) 1 /
b) - a) 0, b)34, c) 0, d) 2, Z) 1 /
c) - a) 0, b) 1, c)35, d) 0, Z) 1 /
d) - a) 0, b) 2, c) 0, d)35, Z) 0 /

L_2	a) - a) 126, b) 41, c) 7, d) 24, Z) 11 /	0.1%
	b) - a) 36, b) 89, c) 39, d) 32, Z) 13°	Low expected values chi sq meaningless
	c) - a) 27, b) 45, c) 77, d) 46, Z) 14°	0.1%
	d) - a) 11, b) 28, c) 60, d) 98, Z) 12°	Low expected values chi sq meaningless

The response of L_1 and L_2 subjects to the test items in Part I and Part II is summarised below in terms of predicted choice.

PART I

L_1 Trend		L_2 Trend	
As predicted	24	As predicted	11
Not significant	3	Not significant	5
Against prediction	3	Against prediction	14
Total	30	Total	30

PART II

L_1 Trend		L_2 Trend	
As predicted	18	As predicted	7
Not significant	4	Not significant	11
Against prediction	1	Against prediction	5
Total	23	Total	23

Overall Results - means (percent of correct responses per question)

The difference between the samples was very highly significant, and the probability of such a difference occuring by chance is virtually zero.

Discussion of the Results

As the summary of results (above) shows, L_1 speakers showed a highly significant tendency to select the predicted paraphrase, though as expected, the S.R.I. cues operated in terms of probability and not certainty. It would have been reasonable to expect L_2 speakers' responses to be in line with these probabilities, though at a less significant level than L_1 speakers. In fact, the L_2 speakers' responses approximate rather to random-choice behaviour,

with as many predicted paraphrases being selected as non-predicted, and almost as many items showing no particular pattern of choice.

The argument was put forward earlier that in order to make a choice it is necessary for the listener in some sense to contextualise the utterance he has heard. In this test two contexts were in effect provided and the listener had to choose between them. L_2 listeners clearly found this harder than L_1 listeners. Perhaps this fact can be accounted for in terms of reading comprehension, though at the level of education reached by the subjects, this seems unlikely A possible explanation is that classroom language learning tends to be decontextualised, particularly in the case of drill work on S.R.I. which is almost invariable divorced from meaning.

Overall the experimental evidence shows that there is a system of stress, rhythm and intonation in English, that this system does effectively cue the language responses of L_1 speakers, and that L_2 speakers with a minimum of ten years of English medium education have little or no mastery of that system.

Comments on Test Items

The major problem encountered by L_1 subjects seems to have been to distinguish between contrastive or emphatic stress marking the 'information point' and an S.R.I. pattern cuing underlying structure. In a number of items (see below), identifying the S.R.I. pattern as contrastive leads to the non-predicted choice. Nevertheless L_1 speakers in this situation made the overall assumption (by confirming the predictions) that the main function of the S.R.I. pattern is to indicate underlying structure.

Item 3

More L_1 subjects than L_2 recognised the significance of the S.R.I. pattern, but both groups went against prediction The stress on 'any' could easily be considered emphatic within context (a).

Item 4.

The only item for which L_2 subjects reacted as predicted while L_1 speakers reacted against prediction Again the cue utterance could easily have been interpreted by L_1 subjects as emphatic. Some L_2 speakers might not know the use of 'pretty' as an intensifier. It is difficult to assess the importance of such semantic variables in several items. In theory, subjects should have made no choice if confused in this way

Item 6

The only other item where L_2 speakers responded more in accordance with prediction than L_1 speakers.

Items 10 and 12.

Both test sentences allow a strong possibility of contrastive stress e.g. "amusing them not annoying them" or "An English teacher not a Frenchman".

Items 17 and 18.

It is tempting to assume here that Item 17 was badly presented since the underlying structures of 17 and 18 are identical and L_1 subjects responded as predicted to Item 18, if not decisively.

Item 30

Item 30 tests S. R. I. patterns in discourse rather than at sentence level. It is interesting that L_2 subjects responded here as predicted.

Item 35

The test item was a poor one since tone of voice (kept neutral here) seems to be at least as important as S. R. I. pattern.

Items 36 and 37

Since these items tested affective response and were given out of context, L_1 subjects performed perhaps surprisingly well. For 7 of the 8 responses by L_2 subjects, more than half were uncertain or made their choice against prediction, a disturbing result when one considers how much a teacher depends on the pupil understanding the precise shades of meaning implied in the way he says "Yes", or "It's not bad". This result suggests too that contextualised learning is not always effective, since the L_2 subjects have been for many years in communication situations involving the meaningful interpretation of such expressions

Some Pedagogical Implications

Since de Saussure, linguists have been generally in agreement that language is a system of relationships. This assumption is made here in its strongest form: that every item in a

sub-system of the phonological, syntactic or semantic components exists in terms of its relationship to all other items in the sub-system, that each sub-system is related to all other sub-systems of the component, and that the components are similarly related to each other

It follows from this assumption that effective language learning associated with a particular item of a particular sub-system must affect all items within the total language system to a greater or lesser extent. George Miller has shown the impossibility of the task of first language acquisition on the basis of necessarily fragmentary data if this were not the case *11

The language learning experience of the L_2 subjects of the experiment reported above was apparently not effective and in terms of the argument presented above, their learning was ineffective because their work on S.R.I. was discrete, the patterns being practised in isolation and in relation only to themselves.

John MacNamara bases the following remarks on studies of both L_1 and L_2 acquisition: "A person's language learning abilities are brought into play only when he is either trying to make out what someone is saying to him in the new language or trying to tell someone something in that language. *12

A. Bruce Gaarder is similarly convinced that the learner's attention must be directed "beyond drills from the beginning and fixed constantly on the meaning and reality of his life experience in the new language, however verbal and vicarious this may be". *13

These points with regard to the nature of both language and learning were summed up by John Carroll in 1966 as being well established if poorly implimented tenets of learning theory:

> "1. The frequency with which an item is practiced per se is not so crucial as the frequency withwhich it is contrasted with other items with which it may be confused.
>
> 2. The more meaningful the material to be learned, the greater the facility in learning and retention." *14

If these arguments are accepted, they suggest that the experimental technique used here can be adapted to provide radically improved teaching materials for S.R.I., materials which will contrast related items within the phonological component and express the relationship of these items with the syntactic and semantic components, and which will express these relationships by reference to different contexts and meanings. It must be admitted that not all S.R.I. patterns are amenable to meaningfully contrastive presentation, but I would like to suggest that those rules or probabilities which are not dependent on meaning contrasts, or

seem not to be, are in fact the by-products of the language acquisition device, the rule-making mechanism, and are largely dependent upon and shaped by those rules which are based on meaningful distinctions. If this is so, then many of the traditional criteria for the selection of teaching materials, such as frequency and utility, become less highly valued than the search for crucial instances where clearly definable meaning differences can be established: where by taking care of the sense, the sounds take care of themselves.

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