

PROTOCOL ANALYSIS OF THE PROCESS OF TRANSCRIPTION

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ABSTRACT

In the first experiment, the phonetic transcription of three undergraduate students was subjected to protocol analysis to determine whether proficient vs. mediocre transcribers used different strategies. A second experiment compared the transcription strategies used by two students early and again later in their training.

INTRODUCTION

In spite of its importance, the process of learning to transcribe phonetically has received little empirical attention. We investigated the hypothesis that proficient vs. mediocre students apply different strategies when faced with a transcription task and that student strategies change with practice. Protocol analysis [1], a procedure devised to investigate problem solving, was adapted to discover strategies used in phonetic transcription.

EXPERIMENT I

Three undergraduate students in introductory phonetics, one earning an A (LF), and two who were less skilled (LD, ST) transcribed a 170 word passage. They were instructed to talk their thoughts out loud while transcribing. All their comments were recorded. They reported no difficulty in verbalizing and found it to be quite natural.

Student comments were written as protocols. Analysis yielded the following classification which represents the expected FLOW of the process of transcription:

1) SCAN: preliminary reading of a sentence or phrase.

2) RECOMBINATION: grouping previously transcribed material with new material.

3) FOCUS: attention in the attempt to transcribe a unit: phrase; word; partial word; syllable; consonant; or vowel.

4) METHOD OF ATTACK: repetition of a unit; blind repetition with no variation; systematic repetition with changes in pronunciation; memory aids or other devices for transcription; orthographic cues.

5) DECISION: exit, final unit uttered signifying completion of transcription; evaluation, comments about transcription.

LF, the proficient student, completed the transcription in 15 min. with 34 errors. The mediocre students required more time; LD required 30 min. with 154 errors and ST 37 min. with 94 errors.

Analysis of the protocols showed three systematic differences between the proficient and the mediocre transcribers: 1) their initial approach to the task, 2) the primary units on which they focused during transcription, and 3) the method of attack.

LF SCANNED up-coming phrases before she attempted to focus on a unit for transcription. This preliminary scan was rarely used by the other two transcribers.

LF used RECOMBINING more than twice as often as LD and ST. LF read lengthy phrases such as "By way of introduction, I'd like..." Almost all LF's efforts were preceded by some type of scan before focusing on a unit for transcription. In contrast, both LD and ST limited their recombinations to two or three words, and sometimes even partial words.

Initially, the students FOCUSED on a unit and subsequently experimented with the details of the unit. They differed in the size of the unit for focus. LF dwelt on relatively large units such as phrases or words. LD initially focused on words but quickly fragmented words into syllables and vowels. When LD did focus on words, she selected short words such as *the*, *to* or *have* while LF concentrated on multi-

syllabic words such as *united*, *immigrant*, or *introduction*. ST typically focused on segments or syllables. The numerical differences of units of focus are given in Table 1.

ST's transcription of *problems* contained two vowel errors as might be expected from her piecemeal approach.

After selecting a unit for focus, the subjects employed a METHOD of attack

Table 1. Units of focus selected in transcription.

	Phrase	Word	Word-part	Syllable	Vowel	Consonant
LF	73	70	15	37	5	2
LD	14	80	12	83	60	8
ST	16	46	27	116	67	15

Table 2. Methods used in transcription.

	Repetition	Blind-rep	Sys-rep	Mem aids	Orthography
LF	68	9	144	26	3
LD	59	75	20	19	32
ST	25	103	24	7	2

In a few instances, LF focused on smaller units but with considerable recombining, as in the following sample:

51. by way of introduction

52. [Introdʌkʃən]

53. by way of [Introdʌkʃən]

54. [Introdʌkʃən]

55. [Introdʌkʃən]

56. [ʃən]

57. [Introdʌkʃən].

LD initially focused on words and then fragmented the word into smaller and smaller units:

88. [Introdʌkʃən]

89. [Introdʌ]

90. [dʌ]

91. [dʌk]

92. [ʃən].

ST rarely focused on words as units but instead attacked syllables and sounds. It was sometimes difficult to determine just which word she was working on:

196. [pra]

197. [pɹ]

198. [pɹə]

199. [pɹə]

200. [bʌʒəmz].

for transcription. Initially, a REPETITION seemed to be used to replay or recheck a word. LF and LD rechecked a unit more than twice as often as ST. LF rarely used BLIND REPETITION whereas LD and ST repeated words without any variation in pronunciation.

On occasion, subjects used MEMORY AIDS about transcription. These were helpful when correct, but comments were sometimes erroneous. LD used ORTHOGRAPHY as a cue. The numerical differences given in Table 2 point out preferences in method.

LF used SYSTEMATIC REPETITION, varying her pronunciation to determine the most appropriate for her transcription. The following shows her approach to transcribing "immigrant families".

33. [ɪmɪgrənt fæmɪlɪz]

34. [tu ɪmɪgrənt]

35. [ɪm ɪgrənt]

36. [ɪmɪgrənt]

37. unstressed

38. [ɪmɪgrənt]

39. [ɪm'ɪgrənt]

40. [ɪmɪgrənt fæmɪlɪz]

41. [fæmlɪz]

42. You don't say [fæmlɪz]

43. [fæmɪlɪz]

In contrast, LD repeated blindly. In her attempt to transcribe each, she confused orthography with phonetic symbols.

464. [ɪtʃ]

465. I don't hear the a

466. [ɪtʃ]

467—470. [i]

471. [æ]

472. [ɪtʃ]

473. Why don't I hear a in these words?

474—475. [ɪtʃ]

ST also used blind repetition of parts of words. In working on *promised*, she pronounced the word only when her transcription was complete. Her repeated vowel was [a] although she wrote [ɔ] as in

259. [pi]

260. [pʃ]

261—264. [a]

265. [ɜ]

266. [a]

267—268. [ɪ]

269. [ɪst]

270. [pramɪst]

In addition, ST used memory aids such as *cow* to remind her of the diphthong [aʊ] more often than the other two transcribers.

The subjects used different patterns to indicate that they were satisfied with the results of transcription. LF used repetitions, usually recombining them with upcoming material. For example, after transcribing *united*, she combined the word with the next item *states*. Both LD and ST tended to repeat only the target word when completing transcription.

In summary, the proficient transcriber attacked the problem of transcription in a different manner from the two less competent transcribers. She initially scanned a portion of the material to be transcribed before focusing on units for transcription. Her units of focus were typically phrases or words. Her predominant method of attack was systematic repetition. She com-

bined previously transcribed material with upcoming material before focusing on the next unit. In contrast, the mediocre transcribers used scanning to a limited degree and tended to focus on small units. LD focused first on words and then fragmented them into syllables and sounds. ST worked from a sound-up direction and often did not pronounce the whole word. Repetitions by LD and ST did not seem to be experimental but simply another attempt to hear the word.

The resulting question is whether a proficient transcriber uses more advanced strategies because of competence or is competence a result of advanced strategies? If students are provided with additional training, will changes in strategies occur? The second experiment is designed to answer these questions.

EXPERIMENT II

In the second experiment, two students (LH and KT) were asked to transcribe the original passage midway in their phonetics course (T1) and another 154 word passage six weeks later (T2). Protocols describing their thoughts while transcribing were obtained at both times. The protocols were analyzed as in the first experiment.

KT, the proficient student, transcribed the T1 passage in 25 min. with 15 errors and LH, the mediocre student, in 30 min. with 49 errors. At T2, both students required the same amount of time as in T1. Both error counts were reduced: KT's transcription was nearly perfect with three errors while LH made ten errors, a vast improvement in accuracy over her first attempt.

Both transcribers SCANNED words and phrases, both scanning phrases more often at T2 than T1. Only LH scanned sentences at T2. KT used recombining of transcribed material with new material, often as a check of her previous work. LH recombined syllables to build up words at T1 but abandoned this procedure by T2.

Both transcribers FOCUSED on words

and syllables as units at T1 with LH focusing on syllables more often than KT. By T2, LH changed her unit of focus from syllables to words and phrases, indicating an ability to handle larger units. The changes in focus for LH and KT at T1 and T2 are given in Table 3.

LH and KT used many Systematic Repetitions as a METHOD OF ATTACK in transcribing words, especially those which they found difficult. KT increased the number of times she used systematic repetition from T1 to T2 while LH used approximately the same number. KT monitored her transcription more than LH did, offering comments such as "I hear a schwa". KT referred to orthography surprisingly often, with observations such as "That's not a t" in transcribing a word with initial [ʃ].

Table 3. Units of focus selected by LH and KT at T1 and T2.

	Phrase	Word	Word-part	Syllable	Vowel	Consonant
LH (T1)	11	107	10	106	17	6
LH (T2)	20	77	13	40	2	4
KT (T1)	8	109	17	84	18	3
KT (T2)	12	63	13	82	6	5

Both LH and KT repeated words or phrases in EVALUATING their work, indicating satisfaction with the transcription. KT sometimes made evaluative comments when terminating transcription. For example, she would reread as in this example, "...or at least reduce static electricity in your body...yeah!" Both made extraneous comments or sighed audibly, particularly when faced with difficult stretches of transcription.

KT was a fairly accurate and proficient transcriber at T1. Since she was doing well, she may not have seen any need to make major changes in her approach to transcription, either in her initial scans, her units of focus, or in her methods of attack. LH was probably aware of some need to improve her performance. At T2, she began to scan longer units and to focus on

words and phrases rather than syllables and segments. The accuracy of her transcription improved at the same time.

In conclusion, we believe the observed evidence between strategies and performance in transcription is compelling. Although our data are based on association rather than a cause-and-effect relationship, the differences in strategies between proficient and mediocre students reflect greater accuracy in transcription. Changes are evident with additional training as well. We plan to incorporate some explicit instruction in transcription strategies in the future. Training will be based on an organized FLOW in which the initial SCAN on mega-units rather than micro-units is emphasized to the extent that students can handle larger units. Scanning will be fol-

lowed by FOCUS on the unit to be scrutinized for transcription. SYSTEMATIC REPETITION of the focal units is the METHOD recommended in determining sound-symbol relationships. RECOMBINING as a strategy throughout will provide for check on old material and the approach to new material. Final EVALUATION of the unit under attack will provide greater assurance of accuracy in the transcription process.

REFERENCES

[1] Hayes, J.R. (1981), *The Complete Problem Solver*, Philadelphia: Franklin Institute Press.