

STRATEGIES WHEN WORKING TEXT RECONSTRUCTION

Strategies employed by students when working text reconstruction programs do not appear well worked out. The research I have encountered at this stage suggests that each researcher makes a separate list of perceived strategies, with little or no attempt to reconcile lists or work within a framework, or even to categorize the strategies according to cognitive load required.

Edmondson, Reck, and Schroder (1988) tracked 9 secondary level students doing a combined jumble sentence/paragraph exercise called SHUFFLE (think-aloud protocols were also used). They distinguish between coherence discovery strategies and linearization ones. The former refers to moves made while developing a hypothesis that is validated if shuffling text eventually achieves coherence, while the latter means grasping the correct order of words or paragraphs and then shuffling in order to make the meaning take shape. Though either case can yield an identical sequence of tracked events, the authors are interested only in the former, and they distinguish the two either from the verbal reports or from noting the timing of movements of elements during reconstruction. The strategies noted in general have little relevance to a study of cloze, except that they noted a tendency for students to use "frontal-attack" strategies; that is, take the first available sentence and try to place it; or build from the first sentence to the next and so on. Though the authors do not report the relative degree of that tendency in their data, there is a relationship here to students who work cloze from one blank to the next, in sequential order.

Trippen, Legenhausen, and Wolff (19??) used a microphone to record utterances when working CALL. Subjects were 28 students of English plus a number of secondary level students, divided into groups based on teacher estimate of ability. Strategies used (not in order of importance): use of high frequency function words (200); guessing (26 times) out 1150 total vocalized activities; semantic strategies such as synonyms, antonyms and collocations (109); grammatical strategies - using what they know about grammar (98); textual strategies - what they know of text types e.g. technical, formal, or any other indicators in text showing what words are likely (56); general knowledge - taking the text title, for instance, and slotting in words relating to that (98); formal strategies - word length indicator, punctuation (111); memory - having seen the text before (105). The authors identified differences in ages and ability levels and found that high ability subjects made greater use of linguistic strategies while low ability ones relied more on general knowledge, memory, and guessing. The authors therefore surmise that training weak students in use of strategies utilized by strong students might produce results.

STRATEGIES WHEN USING CLOZE

Lee's (1990) survey of the previous decade of research on reading gauges the research on several genres of research instrument, including cloze, for beginning, intermediate and advanced learners. No results for cloze research are reported for intermediate learners, and the section on beginners dwells heavily on Nunan, 1985, who finds that "like more advanced learners, beginning language learners perform better on cloze tests on familiar topics than they do on unfamiliar ones." (p.4) But "unlike more advanced learners, beginning language learners are less able to perceive (or perhaps utilize) intratextual relationships when carrying out written cloze tests" (again from Nunan) (p.5)

Advanced readers "unlike native readers ... are more reliant on local redundancy in a text in order to complete a cloze test than they are on longer range redundancy (Douglas, 1981). However, Cziko (1980) also cites several studies suggesting that advanced learners do utilize discourse, semantic, and syntactic constraints on cloze tests, and that they refer outside the sentence for information to help complete such tests.

One conclusion from Nunan's study is that "Beginning language learners are not able to take in the text as an integrated expression of ideas, when the text is violated by blanks. This finding may be a by-product of the fact that the text itself, as presented to readers, is not an integrated expression of ideas." (p.5) Frequent evidence is given in the literature of students not treating cloze passages as integrated readings. Alderson (1980) says "the nature of the cloze test, the filling-in of gaps in connected text, forces subjects to concentrate on the immediate environment of the gap ..." (p.74) Windeatt (1986) also found that his sub-

jects completed cloze blanks in predominantly linear fashion (he thought this was perhaps because they didn't like to scroll from screen to screen). Furthermore, in pilot work with the present implementation of computer-based cloze, the results showed that students with few exceptions addressed only the first 20% of the blanks throughout all the passages recorded.

Feldmann and Stemmer (1987) found that in processing text, only 2 of 20 subjects attempted to skim the entire text, but gave up quickly, as it was impossible because of the gaps (Cohen, Segal & Weiss, 1985, instructed students to skim cloze passages first, but reported similar breakdown). Thus in the Feldmann and Stemmer study, items were tackled sequentially, as reported in Windeatt.

Feldmann and Stemmer found that in solving C-tests, solution was either "automatic" or "non-automatic" (spontaneous vs. considered). In the latter case, recall strategy was used leading either to delay, giving up, or activation of another recall strategy. Once an item was recovered, evaluation strategy was used to check appropriateness (also used for automatic recovery), leading to acceptance or rejection of the item for that blank. Since production problems (e.g. spelling) could still occur after recall of the item, application strategies might also have to be used.

All strategies found by Feldmann and Stemmer are listed in their chapter, plus reference to prior work in the field. Strategies are placed on a bottom-up, top-down continuum. It is possible that the more text is solved, the more redundancy learners have at their disposal to elucidate unsolved blanks; this would have to be taken into account, but does not seem to have emerged as a factor in Feldmann and Stemmer's study.

Alderson (1980) finds that varying the amount of context has no predictable bearing on the ability of either NS or NNS to solve cloze tests. "Neither native nor nonnative speakers were aided in their ability to restore deleted words, or a semantic equivalent, or a grammatically correct word, by the addition even the doubling, of context around the deletion." p.72 More specifically, the effect is: "when cloze items are compared, changing deletion frequency has no effect for either group, but when cloze tests are compared, changing the deletion frequency does have an effect, albeit unpredictable. This effect is the same for native and nonnative speakers." p.66

Other readings regarding learner strategies:

Faerch, C. 1984. Strategies in production and reception - Some empirical Evidence. In Davies, A., Cripser, D., and Howatt, B. (Eds.). Interlanguage. Edinburgh University Press. pp. 49-70.

CALL NO: P53 L39 1987

O'Malley, 1987. Effects of training on strategy use in ESL. In Wenden and Rubin, Learner strategies in language learning, 133-144. - on strategy use; read about in Chapelle & Jamieson in Dunkel

O'Malley, 1985. Language Learning 35, 21-46. - strategies in classroom learning; read about in Chapelle & Jamieson in Dunkel

Oxford. 1991. Review of Language learning strategies, in System 19, 3:323-325.

LeMon, 1988. System 16, 1:37-40

how strategies influence attitudes toward novel instructional approaches
read about in Chapelle & Jamieson in Dunkel

NON-PRODUCTIVE STRATEGIES AND THE QUESTION OF CONTROL

Once it is discovered what strategies students use when solving computer-based cloze, it then remains to decide whether these strategies are ones that should be encouraged or not. Bland, Noblitt, Armstrong, and Gray (1990) for example, examine learner interactions with CALL with respect to a beginning learner

strategy they call NLH, the naive lexical hypothesis, or the beginning learner's assumption that for every word in the L1 there is an exact match in L2. Their study uses Systeme D to track learner queries/explorations of dictionary, vocabulary, grammar, and functional explanations. The authors assume that "these queries represent different strategies for trying to construct meaning in L2, and they suggest different types of developmental interlanguage hypotheses made by classroom L2 learners." p.440 in general, three types of queries were made, suggesting distance of the learner from the NLH: token matching (learner assumes close match in lexical items); type matching (student no longer confuses tokens with types); and relexicalization (the learner searches for alternate ways to express the concept in the L2). In applying the results of such research to CALL, a designer would want to counter a learner's tendency toward the NLH and encourage distance from it.

Accordingly, Windeatt (1986) suggests that computer-based cloze be configured to counter the tendency in students to solve problems gap by gap in strictly linear progression through the text; in other words, the program should somehow encourage students to approach the text holistically. Various ways to do this in the cloze program might be: (1) after an unsuccessful attempt at one problem, to automatically advance the cursor to the next, (2) deny access to the previous problem until another has been attempted, (3) start the cursor at the last gap and let it progress backwards rather than first gap forwards, (4) arrange scoring to favor any of the above behaviors.

Whereas Windeatt creates the impression that he would like to see more student use of program help features, the tendency for some students to abuse the hint and help options available to them was apparent from the preliminary study with SUPER CLOZE cited above. It is assumed that students who rely excessively on program-supplied help are not learning as much as those who try to solve the problems through the trial-and-error feedback accompanied by judicious use of help.

Pederson (1986) showed analogous effects when comparing students who had access to reading passages while answering comprehension questions with those for whom access was denied - consistently reduced retention was evident with the former group. In Pederson's words: "The data from the experiment indicate that subjects consistently recalled more if they answered questions about a passage when it was unavailable for reinspection." (p.38) "In the case of early intermediate French readers in the present study, greater benefit was derived from the subjects' being aware that they were required to do all of their processing of the text prior to viewing the question. ... The results indicate that passage-unavailable treatment always resulted in a comparatively higher comprehension rate than occurred in counterpart passage-available treatments regardless of the level of question or level of verbal ability." (p.39)

The possibility (indeed, likelihood) that students may not of their own free will choose a pathway through the CALL materials leading to optimal learning suggests a re-examination of the magister-pedagogue dichotomy (Higgins, 1983, 1988) which has strongly influenced CALL software development over the past decade. Rather than the computer acting as a pliant slave which unquestioningly obeys all student commands (the role favored in the dichotomy), it may be that an entity which aids the learner on demand while exercising enlightened authority over the learning process is more conducive to learning. But how much authority can a program exert without depriving students of benefits of autonomous learning (thus tending to be a magister, in terms of the dichotomy)? As pointed out by Chapelle and Mizuno (1989:27), the issue of optimal degree of learner control over CALL had "not yet been investigated". The research proposed here has the potential to provide insights on the degree of subtle control necessary in CALL so that it achieves the balance most conducive to learning while still allowing sufficient freedom for students to manage their own learning to the greatest extent possible.

Further reading On CONTROL

Steinberg, Esther. 1989. Cognition and learner control: Literature review. Journal of Computer-Based Instruction 16, 4:

Burston, Jack L. 1990. Towards better tutorial CALL: A matter of intelligent control. CALICO Journal 6, 4:75-89.

Burston, Jack L. 1990. Maximizing intelligent use of unintelligent response handling devices. CALICO Journal 8, 2:77-90.

(There's something in the recent System on student control; and also in one of the other journals I saw at the same time).

and review Chapelle, Carol and Suesue Mizuno. 1989. Student's strategies with learner-controlled CALL. CALICO Journal 7, 2:25-47. - put annotated entry in PHD.BIB

Gay, Geraldine. 1986. Interaction of learner control and prior understanding in computer-assisted video instruction. Journal of Educational Psychology: 225-227.

THE ROLE OF AUTHENTIC TEXT IN FL/SL READING

Authenticity was noted above as one advantage of using text manipulation as a means of CALL delivery. Therefore, it is well to note findings relating to how language learners are able to cope with authentic text. In their study of cognitive and affective responses of L2 learners to authentic input, Bacon and Finnemann (1990) cite Kienbaum, Russel, and Welty (1986), who found from an attitudes survey that elementary level students express a high degree of interest in authentic current events materials. Although many of these students were most comfortable with traditional instruction e.g. vocabulary lists, grammar review items, and finite content and testing, the study encourages trial of authentic materials.

Bacon and Finnemann also note Bernhardt and Berkemeyer's (1988) finding that high school German learners could cope with authentic texts of all types, and "that target language and level of instruction was a more important correlate of comprehension than was text difficulty." (p. 460 in Bacon and Finnemann). In a replication of that study, Allen, Bernhardt, Berry, and Demel (1988) found that their students were able to handle all authentic texts with which they were presented at three different levels i.e. "all subjects were at the very least able to capture some meaning from all of the texts" (p.168 in Allen et al.) - and beginners could handle texts of 250-300 words.

Bacon and Finnemann examined whether perceptions of general language learning (attitudes, motivation, choice of strategy), gender, and willingness to deal with authentic input can be associated with comprehension, satisfaction, and strategy use in situations of authentic input. Results suggest that students are willing to accept and deal with authentic text; e.g. that they perceive its value to their learning and are not unduly constrained (e.g. by a desire to analyze it) in processing what they can. The authors note that students who don't see such activities as directly affecting their grade may be less willing to interact with such text. One interesting finding is that "students do not perceive as beneficial the authentic input an NS instructor can provide," (p.467) possibly because of the increased pressure to interact accurately. In summary, they say that "exposure to authentic text has a positive perceived effect on comprehension and satisfaction and a negative perceived effect on frustration," (p.469) although some heightening of anxiety response was also noted. "The data suggest a two-way typology of learners: those who feel they learn by social interaction and are disposed to use language orally, and those who attribute learning to focused attention on language as an object." p.468 The authors therefore suggest that curriculum be designed to encourage authentic interactions; i.e. it must be presented early on, accompanied by organizers and comprehension checks, and included in the evaluation.

Kleinmann (1987) and Wyatt (1989) both castigate "current" reading courseware for regurgitating textbooks and failing to address higher order reading skills, and Kleinmann suggests that part of the problem is that reading programs do not provide enough comprehensible input. Kleinmann found no significant difference when a basket of 20 CAI reading programs was used to teach reading as opposed to conventional reading materials, though both groups made significant gains in reading. He found that the drill-and-practice nature of the CALL material virtually assured that no great strides would be made in learning (while the Reading Lab environment may have accounted for gains made in both groups). In his view, what is needed is software teaching higher order reading skills.

"If we accept the notion that comprehensible input in the form of text material that is interesting, relevant, and at an appropriate level of complexity is crucial to second language development (Krashen & Terrell) [sic.] then the nonsignificant findings with respect to the effect of CAI compare to non-CAI in the present study are easily understood. Very little of the available reading skills software meets these criteria of comprehensible input, especially for more advanced learners. ... Regardless of research design, attention will clearly need to be paid to creating software designed to develop meaningful communicative interaction between student and student as well as student and computer. Moreover, it will be necessary to develop software that stimulates general learning strategies that have been correlated with successful language learning, e.g. guessing, attending to meaning, self-monitoring (Rubin, Stern), [sic.] as well as more specific strategies relating to particular skill areas. For reading skills development, strategies such as skimming, scanning, and context utilization will be important." p.272

It is possible that working cloze may exercise context utilization (Jonz, Bachman cited above), although scanning is not a skill that cloze encourages (Nunan, Alderson 1980, Windeatt, and Feldmann and Stemmer, also noted above). However, computer-based cloze, and text manipulation programs in general, encourage practice with texts with potential to provide comprehensible input, assuming that learners take advantage of the amount of text that can be made available. And it appears from the results of studies noted here that use of authentic, ungraded text, rather than posing insurmountable problems for second language learners, might instead be an appropriate matrix for exercise of higher order processing skills called for by Wyatt, Kleinmann, and others.

Toward getting students to invoke high-order cognitive skills in solving the cloze-gap problems, I envisage arranging for concordance output to be used as a help feature (that is, when requested, having a concordancer find other contexts for the gapped word and presenting students with a number of these with the gapped word masked). Such feedback is commensurate with Johns' (1991/Should, 1991/PO-HO) concept of data-driven learning.

Making such an option available would raise other questions: how, for example, can students be encouraged to select and learn to interpret unfamiliar forms of feedback? Answers to such questions would contribute toward configuring such feedback so that it promotes language learning. One interesting aspect of the Bland, Noblitt, Armstrong, and Gray (1990) study is the discovery that although students had access to both dictionary and lexical help, they avoided lexical help for fear of getting lost in it. "We were initially surprised at the very few queries of this nature in the data." p.445 Furthermore, in an attempt to reverse the outcome of his Hangman study, where it was found that 53% of the students were touring the material with unacceptable levels of cognitive engagement, Stevens (the present researcher) reconfigured the program so that it presents context surrounding the target word on demand. The demand feature comes at the cost of points, the idea being for students to request just as much context as they need to solve the problem. On examination of the first set of data after the revised program was implemented, it was found that cognitive engagement remained about the same and that the students weren't using the context feature, probably because the program failed to make them aware of it. These are just two examples of the caveat that simply providing options to students by no means ensures that they will use them.

OTHER VARIABLES FAVORING SUCCESS WITH COMPUTER-BASED CLOZE

Bland et al. suggest as a follow-on to their work that "Further research could also examine the relationship of query behavior to the different cognitive and affective styles of learners." p.448 This is only one instance of burgeoning interest in the effects of cognitive style on work with CALL.

Ehrman and Oxford (1990) point out that at least 20 different dimensions of learning style have been examined, deriving from at least 3 psychological traditions. In the study of perception and Gestalt psychology tradition, FI/FD is one of the most widely researched (numerous studies cited). In the Ego Psychology tradition, global-holistic (FD, impulsive, broad categorization, right brain, global and random processing) marks one end of a continuum and forced-detailed (FI, reflective, narrow categorization, left brain, analytic, serialism, and atomism) the other. The third tradition (Jungian) encompasses the above 8 poles.

There are suggestions in the literature that learning styles and strategies used (as well as L2 aptitude) are related. Oxford's taxonomy of strategies includes direct (memory, cognitive, compensation) strategies and indirect (metacognitive, affective, and social) strategies. I intend to explore more fully the literature cited here, esp. literature regarding effects of training in use of learning strategies

This study itself, in making L2 learners aware of their strategies, employs a form of strategy training. The authors typed a group of 20 FSI L2 students (aged 25-52) according to the 4 bi-polar scales extroversion/introversion, sensing/intuition, thinking/feeling, and judging/perceiving according to the Meyers-Briggs Type Indicator and correlated these psychological types (or learning styles) with success in the FSI language courses.

As far as exploratory CALL is concerned, many types seemed to prefer structured learning environments; introverts, judges, and sensing students, for example - and feelers claimed to use no cognitive strategies (except for analysis, rejected by half of them), while judges like the cognitive strategy of drill-like repetition. Intuitives and perceivers on the other hand would probably like CALL - both like change and variety. "Language training for intuitives needs to permit global, even self-directed learning and induction, but through subtle guidance that does not leave the students feeling abandoned." p.320 Perceivers were the most relaxed about language learning, and they also tended to perform to highest standard as language learners.

Chapelle and Jamieson (1986) examined two student variables, time spent using CALL and attitude toward CALL, vs. the cognitive-affective variables field independence, ambiguity tolerance, motivational intensity, and English-class anxiety. They found that both student variables correlated with field independence and motivational intensity. Field independence appears to be a particularly fruitful variable to pursue in determining which students enjoy using CALL. "These analyses indicate that students who are not FI show a significant preference for using CALL; moreover, FI was the exclusive predictor of time spent on PLATO. ... It is likely that the FI students, who are capable of and accustomed to using their own internal referents, found the structured approach of the lessons in the ESL PLATO series to be inconsistent with their learning styles." (p.38) "In contrast, students with little FI may have liked being provided with a fixed set of exercises to work through. These students tend to rely on others to formulate objectives and point out important points, a role played by the PLATO lessons." (p. 39)

Chapelle and Jamieson include the important caveat that these results maintain only for a particular kind of CALL: "In interpreting these results, it is important to underscore the fact that the ESL lessons on the PLATO system cannot be equated with all possible CALL; instead, they represent a particular approach -- one taken in many CALL lessons -- but certainly not the only possible approach. The findings of this study might have been quite different if the lessons offered on the PLATO system had represented a greater variety of approaches." (p. 38)

The authors conclude that "Current CALL is notoriously 'insensitive' to individual learner differences (Hart, 1981) ..." (p.41) In future research, such differences must be taken into account: CALL "effectiveness must be analysed in terms of the effects of defined types of lessons on students with particular cognitive/affective characteristics and needs. To do this, it is necessary to assess the characteristics of students and analyze the approach taken in a particular lesson or series." (p.42) As Wittrock has said (1979:5): "It is more useful and meaningful to study ... how [approach] influences the attention, motivation and understanding, which in turn influence behavior, than it is useful and meaningful to study how [approach] directly influences student behavior. From this point of view, the art of instruction begins with an understanding and a diagnosis of the cognitive processes and aptitudes of the learners."

In subsequent work, the same researchers (Jamieson and Chapelle, 1987) found significant correlations between the cognitive variables field independence and reflection/impulsivity when measured against the learning strategies of advanced preparation and monitoring output. Accordingly, it would be worthwhile investigating what variables (e.g. language proficiency, personality, cognitive style) are involved when students work with computer-based cloze.

Other articles on matching instruction to style:

Pask, G. 1976. Styles and strategies of learning. British Journal of Educational Psychology 46: 128-148.

- students classed as holist or serialist; instruction matched to their learning styles favored learning and "mismatched instruction completely disrupts it" (p.138)

Birckbichler, D. and Omaggio, A. 1980. Diagnosing and responding to individual learner needs. ERIC/CLL Series on Languages and Linguistics 16: 336-345.

- describe in detail activities for impulsive, f/i, ambiguity intolerant students

Witkin, H.A., C.A. Moore, D.R. Goodenough, and P.W. Cox. 1977. Field-dependent and field-independent cognitive styles and their educational implications. Review of Educational Research 47, 1:1-64.

Another variable of possible significance with Arab learners is the extent to which tracking of progress with the program focuses attention and improves performance. Studies with Arab learners have suggested that performance on CALL is enhanced in proportion with such learners' perception of the program's effect on their evaluation. Producing data showing, for example, that 55% of Bahraini university student respondents to a questionnaire enjoy using computers because it helps them practice "language items learned in class" (vs. 14% who enjoy "working on their own" and 7% who enjoy "working at their own pace"), Dhaif (1990) finds that his research "undermines one of the basic assumptions about the attraction of using the computer for teaching languages, namely, that it offers a valuable source for self-access learning." (p. 70) Similarly, Littlejohn (1983) implemented a learner-managed course with Arab students in Bahrain and encountered "considerable resistance to or lack of comprehension of the purpose behind the tasks, uppermost in their minds being the examination which they knew they were to re-take." (p.606) In consideration of such findings, it might be useful to see if measurable effects on the effectiveness of computer-based cloze are obtained simply by making subjects aware that their performance is being monitored. Findings would also address the implication that there is a difference between subject performance in intrusive and non-intrusive studies.

CONCLUSION

Several research questions are suggested by the foregoing discussion. These questions can be subsumed under three general paths of inquiry:

1. How can a computer-based cloze program be configured to promote learner strategies conducive to language learning?
2. How can misuse of computer-based cloze be discouraged?
3. What other variables might favor success with computer based cloze; in particular language proficiency, cognitive style, tracking of student progress, and modeling of appropriate use of the program?

The study begins with an analysis of student strategies when working prototype versions of SUPER CLOSE, an implementation of computer-based cloze. The design of the program will then be adjusted to encourage productive behaviors and discourage non-productive ones. One purpose of the study will be to build into the program constraints on help meant to steer the learners into drawing on their cognitive resources rather than allowing the program to solve the problem for them. This might be achieved by limiting or penalizing recurrent exposure of solutions, perhaps through design of a scoring algorithm that will favor the desired behavior (however, it appears from recent Hangman data that scoring is not of great importance to those subjects). Thus one purpose of the study then is to explore methods of judiciously restraining programmed help so that students are subtly guided toward helping themselves.

One reason that students eschew or abuse help may be that they are unfamiliar with the concept of learning using text manipulation on computers and simply need to be shown how to use the program properly.

Toward this end, another aspect of the present project is to model the program for a group of students and examine how their subsequent use of the program differs from that of a control group.

There are countless considerations in the optimal design of a computer-based cloze program. For example, should the program be case-sensitive, or not, or should students be allowed to choose? What, if anything, can we learn from examining how passage difficulty and student frustration or success interact? Again, I can only speculate at this point on productive directions for research. It could be that some of these areas are non-productive (there was no significant correlation, for example, between passage difficulty and student frustration/success in the pilot study), while still other paths of inquiry might be suggested through observation of student interaction with the program at its various stages of development.

As has been pointed out, claims for the efficacy of much of the software developed for language learning are often based on the developer's intuition. It is hoped by conducting the proposed course of inquiry to produce a computer-based cloze program for which the learning outcome can be reasonably assured, according to tests leading to development of the final product.

REFERENCES

- Adams, M.J. and Collins, A. 1979. A schema-theoretic view of reading. In R. O. Freedle (Ed.). New directions in discourse processing. Norwood, N.J.: Ablex, 1-22. - on learner strategies, esp. bottom-up and top-down processing
- Alderson, J. C. 1979. The cloze procedure and proficiency in English as a foreign language. TESOL Quarterly 13:219-227.
- Alderson, J. C. 1980. Native and nonnative speaker performance on cloze tests. Language Learning 30, 1:59-76.
- Alderson, J. C. 1986. Cited in Jonz I think NOT
- Alderson, J. Charles, and A.H. Urquhart (Eds.). 1984. Reading in a foreign language. Burnt Mill, Harlow: Longman.
- Allen, Edward, Elizabeth Bernhardt, M. Berry, and M. Demel. (1988). Comprehension and text genre: An analysis of secondary school foreign language readers. Modern Language Journal 72: 163-172.
- Anderson, Neil J. 1991. Individual differences in strategy use in second language reading and testing. The Modern Language Journal 75, iv: 460-472.
- Bachman, L.F. (1982). The trait structure of cloze text scores. TESOL Quarterly, 16, 61-70.
- Bachman, L.F. (1985). Performance on cloze tests with fixed-ratio and rational deletions. TESOL Quarterly, 19, 535-556.
- Bacon, Susan M. and Michael D. Finneemann. 1990. A study of the attitudes, motives, and strategies of university foreign language students and their disposition to authentic oral and written input. The Modern Language Journal 74, iv: 459-473.
- Bernhardt, Elizabeth, and Victoria Berkemeyer. (1988). Authentic texts and the high school German learner. Unterrichtspraxis, 21: 6-28.
- Bland, Susan K., James S. Noblitt, Susan Armstrong, and Geri Gray. 1990. The naive lexical hypothesis: Evidence from computer-assisted language learning. The Modern Language Journal 74, iv:440-450.

Butler, Jonathan. 1991. Cloze procedures and concordances: The advantages of discourse level authenticity in testing expectancy grammar. System 19, 1/2:29-38.

Chapelle, Carol, and Joan Jamieson. 1986. Computer-assisted language learning as a predictor of success in acquiring English as a second language. TESOL Quarterly 20, 1:27-46.

Chapelle, C. and S. Mizuno. 1989. Student strategies with learner controlled CALL. CALICO Journal 7, 2:25-47.

Chavez-Oller, M.A., Chihara, T. Weaver, K.A., and Oller, J.W., Jr. (1985). When are cloze items sensitive to constraints across sentences? Language Learning, 35, 181-206.

Cousin, William. no date. Computer clozentropy measures: Groundwork for an investigation. manuscript (supplied via personal communication to present researcher).

Cohen, A., Segal, M., and Weiss, R. 1985. The C-test in Hebrew. Fremdsprachen und Hochschulen (sic). AKS-Rundbrief 13/14, 121-127. - reported difficulties with having students skim through cloze passages prior to working them

Cousin, William. no date. Computer clozentropy. manuscript (supplied via personal communication to present researcher).

Cziko, Gary A. 1980. Language Competence and reading strategies: A comparison of first- and second-language oral reading errors. Language Learning 30, 101-115.

Douglas, D. (1981). An exploratory study of bilingual reading proficiency. In Hudelson, S. (Ed.). Learning to read in different languages. Washington Center for Applied Linguistics.

Darnell, D.K. 1968. The development of an English language proficiency test of foreign students using a clozentropy procedure. Final report. University of Colorado, Boulder. Dept. of Health, Education, and Welfare Research Bureau No. BP-7-H-010TP.

Dhaif, H. 1990. Computer assisted language learning: A client's view. CALICO Journal 7, 4:67-81.

Dulany, D.E., R.A. Carlson, & G.I. Dewey. (1984) A case of syntactical learning and judgment: How conscious and how abstract? Journal of Experimental Psychology, General, 114: 25-32.

Dunkel, P. 1991. Computer-assisted language learning and testing: Research issues and practice. Newbury House.

Edmondson, Willis, Sabine Reck, and Norbert Schroder. 1988. Strategic approaches used in a text-manipulation exercise. In Jung, Udo O.H. (Ed.). Computers in applied linguistics and language teaching. Frankfurt: Verlag Peter, Lang, pp.193-211.

Ehrman, Madeline, and Rebecca Oxford. 1990. Adult language learning styles and strategies in an intensive training setting. The Modern Language Journal 74, iii:311-327.

Faerch, C. and G. Kasper (Eds.). 1987. Introspection in second language research. USA: Clevedon.

Feldmann, Ute, and Brigitte Stemmer. 1987. Thin- aloud a- retrospective da- in C-Te- taking: Diffe- languages - diff- learners - sa- approaches? In Faerch, C. and G. Kasper (Eds.). 1987. Introspection in second language research. USA: Clevedon. pp. 251-267.

Fransson ... In Alderson, J. Charles, and A.H. Urquhart (Eds.). 1984. Reading in a foreign language. Burnt Mill, Harlow: Longman. pp. ???

Gaies, S.J. 1986. Validation of the noise test. In R. Grotjahn, C. Klein-Braley, and D.K. Stevenson (Eds.). Taking their measure: The validity and validation of language tests (= Quantitative Linguistics 30). Bo-

chum: Brockmeyer. - on the validation of C-tests

Garrett, Nina. 1988. Software review of Text Tangles: A Vance Stevens RDA/Mindbuilders Software. Journal of Educational Techniques and Technologies 21,2/3:59-61.

Goodman, K.S. (1974). Miscue analysis: Theory and reality in reading. Paper presented at 5th World IRA Congress, 1974. In Merritt, J. (Ed.). Proceedings, New horizons in reading. International Reading Association, Vol. 19, 1976.

Harri-Augstein, Sheila, and Laurie F. Thomas. (1984). Conversational investigations of reading: The self-organized learner and the text. In Alderson, J. Charles, and A.H. Urquhart (Eds.). Reading in a foreign language. Burnt Mill, Harlow: Longman.

Hart, R. (1981). Language study and the PLATO system. Studies in language learning 3, 1-24.

Higgins, J. 1983. Can computers teach? CALICO Journal 1, 2:4- 6.

Higgins, J. 1988. Language, learners and computers. London: Longman.

Hosenfeld, C. 1976. Learning about learning: Discovering our students' strategies. Foreign Language Annals 9: 117-129.

Hosenfeld, Carol. Case studies of ninth grade readers. In Alderson, J. Charles, and A.H. Urquhart (Eds.). 1984. Reading in a foreign language. Burnt Mill, Harlow: Longman. pp. 231-

Jamieson, J. and C. Chapelle. 1987. Working styles on computers as evidence of second language learning strategies. Language Learning 37, 4: 523-544.

Johns, Tim. 1988. Whence and whither classroom concordancing? In Bongaerts, Theo et al. (Eds.). Computer applications in language learning. Foris.

Johns, T. 1991. From printout to handout: Grammar and vocabulary teaching in the context of data-driven learning. In Johns, Tim, and Philip King (Eds.). Classroom concordancing, ELR Journal 4. University of Birmingham. pp. 27-37.

Johns, Tim. 1991. Should you be persuaded: Two examples of data driven learning. In Johns, Tim, and Philip King (Eds.). Classroom concordancing, ELR Journal 4. University of Birmingham. pp. 1-16.

Jones, C. CLOZEMASTER

Jonz, J. 1990. Another turn in the conversation: What does cloze measure? TESOL Quarterly 24, 1:61-83.

Kienbaum, Barbara, A.J. Russel, and S. Welty. 1986. Communicative competence in foreign language learning with authentic materials. Final project report, ERIC 275200.

Klein-Braley, C. 1983. A cloze is a cloze is a question. In Oller, J., (Ed.). Issues in language testing research. Rowley, MA: Newbury House, pp. 218-228.

Klein-Braley, C. 1985. Reduced redundancy as an approach to language testing. Fremdsprachen und Hochschule (sic). AKS-Rundbrief 13/14, 1-13. - on the validation of C-tests

Klein-Braley, C. 1985. C-tests and construct validity. Fremdsprachen und Hochschulen (sic). AKS-Rundbrief 13/14, 55-65. - on the validation of C-tests

Klein-Braley, C. and Raatz, U. 1984. A survey of research on the C-Test. Language Testing 1, pp.134-146.

Kleinmann, H. 1987. The effect of computer-assisted instruction on ESL reading achievement. The Modern

Language Journal 71, 3:267-276.

Krashen, Stephen, and Tracy Terrell. 1983. The natural approach: Language acquisition in the classroom. Elmsford, NY: Pergamon.

Laufer, Batia, and Helen Osimo. 1991. Facilitating long-term retention of vocabulary: The second-hand cloze. System 19, 3:217-224.

Lee, James. 1990. A review of empirical comparisons of non-native reading behaviors across stages of language development. Paper presented at SLRF, Eugene, Oregon, (manuscript).

Littlejohn, Andrew. 1983. Increasing learner involvement in course management. TESOL Quarterly 17, 4:595-608.

McLaughlin, Barry. 1990. "Conscious" versus "unconscious" learning. TESOL Quarterly 24, 4:617-634.

McLaughlin, B., T. Rossman, & B. McLeod. 1983. Second language learning: An information-processing perspective. Language Learning 33: 135-158.

McClelland, J., D. Rumelhart, and G. Hinton. 1986. The appeal of parallel distributed processing. In D. Rumelhart, J. McClelland, and the PDP Research Group (Eds.), Parallel distributed processing: Explorations in the microstructures of cognition, Vol. 1, Foundations. Cambridge, MA: MIT Press, pp. 3-44.

Millmore, S., and Stevens, V. 1990. SUPER CLOZE (in various versions). Shareware available through CALL Interest Section MS-DOS Users Group, TESOL.

Nevo, Navo. 1989. Test-taking strategies on a multiple-choice test of reading comprehension. Language Testing 6: 199-215.

Nunan, David. (1985). Content familiarity and the perception of textual relationships in second language reading. RELJ Journal 16, 43-50.

Oller, J.W. 1976. Evidence for a general language proficiency factor: An expectancy grammar. Die Neueren Sprachen, 165-174.

Oller and Inal. 1971. (I seem to have lost the reference for this one)

Pederson, Kathleen Marshall. 1986. An experiment in computer-assisted second language reading. Modern Language Journal 70, 1:36-41.

Piper, Alison. 1986. Conversation and the computer: A study of the conversational spin-off generated among learners of English as a foreign language working in groups. System 14, 2:187-198.

Pritchard, Robert. 1990. The effects of cultural schemata in reading processing strategies. Reading Research Quarterly 25: 273-295.

Reber, A.S., and R. Allen. (1978). Analogic and abstraction strategies in syntactic grammar learning: A functional interpretation. Cognition 6, 189-221.

Rubin, Joan. 1975. What the 'good language learner' can teach us. TESOL Quarterly 9, 41-51.

Rutherford, William. 1987. Second language grammar: learning and teaching. Longman.

Schmidt, R. (1990). The role of consciousness in second language learning. Applied Linguistics 11: 129-158.

Segel, Kerry. 1986. Does a standardized reading comprehension test predict textbook prose reading proficiency of a linguistically heterogeneous college population? Dissertation, University of Texas.

Shiffrin, R.M., and W. Schneider. (1977). Controlled and automatic information processing: I. Detection, search, and attention. Psychological Review 84: 1-66.

Stern, H.H. 1980. What can we learn from the good language learner. In Croft, Kenneth (Ed.) Readings in English as a Second Language 2nd Edition. Cambridge, MA: Winthrop, 54-71.

Stevens, Vance. 1988. A critical but overlooked factor: Not can but will teachers modify the software? C.A.L.L. Digest 4,8:3-5.

Stevens, Vance. 1990. Text manipulation: What's wrong with it anyway? CAELL Journal 1, 2:5-8; reprinted in ON-CALL 5, 1:5-10.

Stevens, Vance. 1991. Reading and computers: Hangman and cloze. CAELL Journal 2, 3:12-16.

Stevens, Vance. 1991. Strategies in solving computer-based cloze: Is it reading? Paper presented at the Annual Meeting of the Teachers of English to Speakers of Other Languages (25th, New York, NY, March 24-28, 1991). ERIC Document Reproduction Service No. ED 335 952.

Stevens, Vance. 1991. Computer HANGMAN: Pedagogically sound or a waste of time? Revised version of a paper presented at the Annual Meeting of the Teachers of English to Speakers of Other Languages (24th, San Francisco, CA, March 6-10, 1990). ERIC Document Reproduction Service No. ED 332 524).

Stevens, Vance. 1991. Classroom concordancing: Vocabulary materials derived from relevant, authentic text. English for Special Purposes Journal 10: 35-46.

Stevens, Vance. 1991. Concordance-based vocabulary exercises: A viable alternative to gap-fillers. In Johns, Tim, and Philip King (Eds.). English Language Research Journal, Vol. 4, University of Birmingham, pp. 47-61.

Taylor, Wilson. 1954. Applications of cloze and entropy measures to the study of contextual constraint in samples of continuous prose. Unpublished Ph.D. thesis, University of Illinois.

Trippen, Gaby, Lienhard Legenhausen, and Dieter Wolff. 19?? Lernerstrategien und Lernprozesse bei der Bearbeitung von CALL-Software. In Sprache und Individuum, Kongresse-beitrage der 17. Jahrestagung der Gesellschaft fur Angewandte Linguistik, GAL e.V. Hrsg. von Wolfgang Kuhlwein und Bernd Spillner: Sektion Technologie und Medienverbund.

Windeatt, S. 1986. Observing CALL in action. In Leech, G. and C. Candlin (Eds.). Computers in English language teaching and research. Longman.

Wittrock, M.C. 1979. The cognitive movement in instruction. Educational Researcher 8: 5-11.

Wyatt, D. 1989. Computers and reading skills: The medium and the message. In Pennington, M. (Ed.), Teaching languages with computers: The state of the art. Athelstan.

A note on references to these items in the above text: Where two citations are used for the same author in the same year, the item is referred to in the text by some mnemonic rather than in the conventional means (1991a, 1991b, etc.). This is because in revision, a's and b's get changed about and it becomes impossible to keep straight which citation was meant, whereas with a mnemonic this problem is solved. In the final version, the conventional form will be used throughout.