Academic Listening and Lecture Notetaking for L1/L2 Students: The Need to Investigate the Utility of the Axioms of Good Notetaking

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This review of the literature on lecture notetaking (1) delineates the avenues of past research concerning learning from L1 lectures as a function of L1 notetaking; (2) highlights the dearth of research concerning the processing of L2 lecture information by advanced foreign/second language learners; (3) outlines accepted axioms of good notetaking; and (4) suggests continued research to assess the utility of these axioms, and to explore further L2 lecture information processing.

The lecture is the method of information transmittal most often encountered by college students in the university instructional setting. For those attending lectures given in their native language (L1), taking notes is the habitual reaction. Many foreign/second language (L2) students resort to this same metamemory strategy when faced with the task of listening to a lecture given in a language other than their native language. Learning how to listen and take notes in L2 is, in fact, perceived to be "a question of academic survival" for those non-native English speaking students who intend to pursue academic degrees in English-speaking universities (Dunkel & Pialorsi, 1982). L2 textbook writers have, as a result, published materials with accompanying audio- and videotapes to help international students develop their listening and notetaking. A review of these programmes reveals the variety of instructional approaches taken to help L2 students develop academic listening and notetaking skills, and suggests the considerable amount of interest in providing pre-university ESL/EFL students with experience in encoding and decoding extended spoken academic discourse.

Notetaking Materials

Almost twenty years ago, Coltharp (1969) devised a series of audiotaped lectures giving students practice in listening to different lecturers while

they take notes or outline the lecture information. Addressing the problem of Hebrew-speaking university students required to attend lectures given by visiting English-speaking professors, Mendelsohn and Klein (1974) designed a curriculum to develop intensive listening and notetaking skills. In attempting to prepare Indonesian college instructors in English language skills that they would need for study abroad, Weissberg (1974) developed an audiotape series of microlectures which focus student attention on cue-features of lecture language, such as connectors, new topic markers and reiterative cues. So's (1974) language lab programme for advanced ESL students utilized a set of audiotapes covering three categories of discourse (e.g., lectures, speeches, and dialogues) to give practice in listening for comprehension, notetaking, summary writing, outlining, and oral communication. Ewer (1974) targeted tertiary-level students of science and technology in the non-English speaking world who receive science and technology training in English. Instead of a series of audiotaped lectures, Ewer devised self-contained, teacher-delivered lecturettes on science and technology subjects. He enjoined that the *reading-style* in lecture delivery be avoided at all costs and that the lecturettes be delivered to the class in *lecture-style* with pauses, hesitations, gestures, and glances toward the audience. Also involved in teaching lecture notetaking to ESL students of science and technology, Otto (1979) concentrated on developing focussed listening, notetaking and outlining of discourse related to basic concepts in university-level mathematics, physics, and chemistry. Sims and Petersen (1981) added the dimension of video to their programme of listening and notetaking development. Plaister's (1976) mythical Kingdom of Kochen series included a notetaking model of the lecture in the instructional design and provided students with numerous repetitions of the lecture in the attempt to saturate the listener with the structure and vocabulary of the minilectures, thereby freeing them to concentrate on the *act* of taking notes. Two other curriculum designers in the field of ESL notetaking instruction, Snow and Perkins (1979), created a set of listening comprehension lectures, revolving around topics pertinent to agriculture, psychology and sociology, and recorded in natural speech. Deploring the fact that artificially constructed listening comprehension materials especially cooked for ESL students often reduce the amount of language redundancy available from a speaker in a natural setting, thereby making the listening task unnaturally difficult, the authors included false starts, lapses, and long pauses in their taped lecture presentations. Dunkel and Pialorsi's listening and notetaking programme (1982) emphasized listening for, and taking note of, factual, detailed information as a first step in developing extended listening and notetaking skills. Notetaking skill development is built up through modelling, shaping, prompting, fading, and reinforcement

via a series of audio- and videotaped lectures. A series of listening and learning modules by Young and Fitzgerald (1982) is composed of mini-lectures on academic topics (e.g., economics and commerce; psychology and education; and political science and law). Accompanying activities provide practice in information analysis and transfer as well as in notetaking techniques. In 1983 Mason's material introduced college-bound ESL students to the many elements that constitute lecture comprehension: (1) the role and style of lecturers; (2) the use of language and vocabulary characteristic of lecture rhetoric; and (3) techniques for notetaking. Reutten's (1986) programme was fashioned to enable students to first focus on the main point of a lecture and then on the supporting information given by the lecturer. The study-skills text was also aimed at helping students recognize typical rhetorical and organizational patterns in academic discourse and to use previous information and expectations about university courses in order to make appropriate predictions about the content, focus and organizational scheme of the audiotaped lecture.

Is Notetaking Facilitative of Lecture Information Processing?

Although authors have attempted with various approaches and, no doubt, with varying degrees of success to fashion better notetakers out of non-native speakers of English, the basic question remains: Is there actually research support for the facilitative effect of notetaking on the learning and recall of L2 lecture material? While a review of empirical data gathered over the past six decades on the comprehension and recall of lecture information suggests that L1 students generally derive positive benefits from notetaking during English lecture presentations (Ganske, 1981), the research data also (1) reveal some equivocal findings concerning the effect of L1 notetaking, (2) highlight the dearth of research assessing the effect of notetaking on L2 lecture learning, (3) suggest the need for additional research to probe the efficacy of L2 notetaking, and (4) challenge researchers to analyze and test the axioms of good notetaking propounded in study skills textbooks that teach lecture notetaking.

The purpose of this review then is as follows: (1) to examine the relevant L1 notetaking literature in order to delineate the avenues of past research; (2) to outline the major research paradigms used to drive the notetaking investigations; (3) to enumerate some of the pedagogical guidelines found in the L1 study-skills literature which might pose research questions for L2 notetaking researchers and serve as instructional frameworks for L2 study skills teachers; and (4) to stress the need for additional research in the area of L1/L2 notetaking practices in order to illuminate the covert cognitive processing of extended spoken discourse by L1/L2 listeners.

The L1 Research Focus: The Process and Product Functions of Lecture Notetaking

Taking lecture notes is widely accepted as a useful strategy for augmenting student attention and retention of academic discourse. Notetaking is intuitively appealing to learner and lecturer alike and is generally viewed as one class of mathemagenic activity (Rothkopf, 1970) that facilitates the process of learning and retaining lecture material. The facilitative effect of notetaking on the assimilation of lecture content is thought to derive from one or both of two postulated functions: (1) the encoding function; and (2) the external storage function (Di Vesta & Gray, 1972). Hartley and Davies (1978) contrast these functions and suggest that encoding aids learning and retention by activating attentional mechanisms, and by engaging the learner's cognitive processes of coding, integrating, synthesizing, and transforming the aurally received input into a personally meaningful form. The importance of the external storage function of notetaking is recognized by those who postulate that the notes serve as an external repository of information which permits later revision and review to stimulate information recall. Carrier and Titus (1979) have dubbed the storage versus encoding hypotheses concerning the utility of notetaking the *product versus process* dichotomy.

While notetaking is intuitively appealing to both learner and lecturer, one would like to know whether past research supports or confirms these intuitions concerning the efficacy of notetaking. Since, to date, only one empirical investigation of L2 notetaking has been reported (see Dunkel, 1988), the utility of L2 notetaking is still open to question. Let us, however, briefly survey the literature concerning L1 notetaking to help find an answer to the question: Does notetaking positively affect the comprehension and recall of lecture information for L1 and L2 learners?

The Process Versus Product Dichotomy of Lecture Notetaking: The Empirical Investigations

A major category of L1 research includes studies concerning the process versus product effect of notetaking. Carrier (1983) frames the process/product hypotheses in relation to the student activities during and after the lecture (Figure 1).

In conducting L1 notetaking research, investigators have traditionally compared L1 notetakers to L1 non-notetakers using immediate and/or delayed quizzes based on the lecture material. Results of one of the earliest experiments indicated that "taking notes on a point does not guarantee its being recalled at the time of the quiz, but failing to take notes on it very greatly decreases its chances of being recalled" (Crawford, 1925a: 289). Half a century later Aiken, Thomas, and Shennum (1975) also found that

lecture material was twice as likely to be recalled if it was configured in note form than if it was not. Howe's (1970b) research lends support to the notion that there is a positive correlation between notetaking and information recall. In his study, the probability of recalling an item that appeared in written notes was .34, whereas the probability of recalling an item that was not in the notes was .047.

Figure 1. Two hypotheses about notetaking.

A. The Encoding Hypothesis

The audience is divided between Notetakers and Listeners (who do not take notes).

Notetakers:

- Attend carefully to avoid missing critical points
- Compare new information to stored information
- Translate lecturer's words into own words
- Create a larger structure for later use

Listeners:

- Daydream
- Read other material
- Doodle
- Lose concentration

B. The External Storage Hypothesis

According to this hypothesis, the real value of notetaking occurs during later review of the notes.

Typical Activities During Notetaking:

- Record information in rote, verbatim fashion
- Copy, but do not react to or process information
- Record as much as possible without discriminating between essential and nonessential information

Typical Activities During Later Review:

- Review and rehearse information
- Rewrite notes in own words
- Seek clarification of some points
- Compare prior knowledge with new knowledge

Source: Carrier 1983.

Investigating the External Storage Hypothesis: The Product Value of L1 Notetaking

Other empirical studies by Carter and Van Matre (1975), Fisher and Harris (1973), and Thomas (1978) demonstrated improved recall due to notetaking and rehearsal of the notes taken. Fisher and Harris concluded that notetaking serves both an encoding function and an external memory function, with the latter being more important. Results indicated that a combination of taking and reviewing notes yielded maximum immediate and delayed recall. Lending support to Fisher and Harris' work of 1973, Carter and Van Matre (1975) found that taking and reviewing notes led to superior performance on both immediate and delayed tests of recall. Their data strongly suggested the external storage function of notes and clearly implied that the *having and reviewing*, rather than the *taking per se* of notes facilitated recall performance. In their discussion of the results, Carter and Van Matre put forth four points to explain the importance of the storage claim: (1) learners are given an additional learning trial when reviewing notes; (2) note review inhibits recall of irrelevant material; (3) learners who can review their notes apparently are able to focus their retrieval efforts more effectively; and (4) notes cue reconstruction of parts of the lecture not initially recorded in them. Thomas (1978) similarly acknowledged the powerful effect of the external storage function of notes. Summarizing the findings with respect to the question, "Does reviewing notes help recall?" Hartley and Davies (1978) determined that 13 out of 16 studies indicated that for L1 notetakers, it does. According to Hartley and Davies, only three studies (Fisher & Harris, 1974a; 1974b; Peters & Harris, 1970) found no significant difference between the review and non-review conditions of L1 notetaking.

Investigating The Encoding Hypothesis: The Process Value of L1 Notetaking

Some researchers (Barnett, Di Vesta & Rogozinski, 1981; Howe, 1970a) view the encoding function of notetaking as the more important of the two functions. They argue that too great a reliance on notes as an external memory device can result in inefficient learning if crucial encoding fails to take place. Howe suggests that if the only reason for taking notes were to *have* them, it would be far simpler to provide mimeographed outlines of the lecture before class so learners could be free to attend and react to other cues in the lecture presentation. Howe (1974) stipulates that *taking* notes aids the learners' attending to knowledge they are attempting to assimilate and brings about a deeper processing of the information. According to Peper and Mayer (1978), notetaking could be viewed as requiring more effort on the part of the learner than just listening and that

material which requires deeper levels of activity is encoded more deeply; this could be called the *effort theory* and is similar to Craik and Lockhart's (1972) principle of levels of processing. Annis and Davis (1975) came to a similar conclusion that personally encoding the lecture through the taking of notes is very important for success on tests of recall. Strong support for the encoding function of notetaking was also found in a L1 study conducted by Barnett, Di Vesta, and Rogozinski (1981).

Condensing the research on L1 notetaking, Hartley and Davies (1978) cite 17 out of 35 studies supporting the contention that the process of notetaking itself aids recall. In addition, studies by Bentley (1981), Maqsud (1980), Thomas (1978), Weiland and Kingsbury (1979) also support the beneficial effect of the *act* of notetaking on lecture information recall. In sixteen studies, however, no significant differences were found in the recall scores of those who took notes and those who were precluded from taking notes (Hartley & Davies, 1978).

Extending the L1 Notetaking Base to L2 Investigations: Methodological Issues

An examination of the literature on notetaking reveals the dearth of research devoted to the investigation of L2 notetaking. Clearly, this avenue of research needs to be given serious consideration by those who seek to understand L2 information processing and the impact of second-language lecture notetaking. With the exception of the empirical studies conducted by Dunkel and Chaudron et al. (1988), little research has appeared in the second-language or educational-psychological literature. What types of studies then need to be done on lecture notetaking, and what procedures should be followed in assessing the utility of L2 notetaking for lecture processing? Hartley and Davies (1978) outline the methodological division within L1 research concerning ways to answer questions about notetaking; the division splits the literature into (1) the *naturalistic approach* (e.g. the initial lecture notetaking investigations of the 1920s and 1930s) and the *analytic experimental method* (the methods in vogue in investigations of the 1950's through the 1970s). The naturalistic approach involved analysis of data gathered in the field, in live lecture situations, using actual lectures and course tests (e.g. Crawford, 1925a, b; Jones, H. E., 1923; Jones, E. S., 1930). More empirical, less ecological methodology drove the research of investigators such as Berliner (1968), Di Vesta and Gray (1972, 1973), Fisher and Harris (1973, 1974). The empirical investigations used brief, neutral subject matter lectures presented via audiotape or videotape, and placed an emphasis on the internal validity of the experiments. In the late 1970s and at present, both traditions seem to co-exist, with ecological researchers examining notes taken during actual lectures (e.g.

Ganske, 1981; Hartley, 1976; Kiewra, 1984; Norton, 1981), and with empirical researchers using tightly controlled laboratory-like procedures in their investigations (e.g. Bentley, 1981; Dunkel, 1988: Weiland and Kingsbury, 1979).

Commenting on the limitations of the two procedures, Hartley and Davies (1978) note that while the naturalistic approach does not provide adequate control for a number of potentially important variables (e.g. subject aptitudes and characteristics), and while it is difficult in a naturalistic study to be precise about what indeed is occuring in terms of the synthesis, evaluation, and integration of information by notetakers, the controlled, analytic studies may lack external validity. It is easier to be precise about what is occurring in the analytic studies, but it may be questionable whether the results that emerge apply for notetakers in actual lecture situations. Both research strategies have strengths and weaknesses. It may be that investigation of variables identified as relevant to the processing success of notetakers in the analytic studies (e.g. memory, aptitude, and language proficiency) should be further investigated in natural settings. Hartley and Davies (1978) stress that if L1 notetaking studies (or L2 studies, for that matter) are to have external validity, then they must include naturalistic situations, replications with different lectures and lecturers, and students unaware that they are taking part in experiments. Further experiments should, as a result, include use of the ecological paradigm of research, involving direct observation and perhaps even case histories. Until a veritable mosaic of L1 and L2 notetaking findings exists, one that has been amalgamated both from experimental and ecological research investigations, there is a great need for the accrual of additional ecological and experimental data concerning the information processing benefits and liabilities of lecture notetaking. While there seems to be a trend in L2 acquisition and classroom research toward quantitative (empirical) research (see Chaudron, 1986; Gaies, 1983; Henning, 1986), it also appears that qualitative research conducted in naturalistic lecture settings is being called for. As Chaudron, (1986) exhorts, L2 research should draw on both the qualitative and quantitative approaches both to pose and seek answers to basic research questions.

Notetaking Dicta Based on Intuition and Expert Advice: Some Axioms of Good Notetaking

Researchers often assert that notetaking is important, either because students believe it to be so, or because it may provide an approach to studying the black box of cognitive processing (Ganske, 1981:64). In addition, ESL materials writers and curriculum developers believe notetaking to be an important skill for L2 learners to develop as evidenced by the

number of published textbooks targeted at developing ESL learners' notetaking skill. Although the content, focus, and approach of these books vary, as previously suggested, they incorporate many of the *axioms* of good notetaking in their instructional designs. Many of these axioms have been framed from intuitive beliefs and have been set forth in study guides and articles in the literature. Teachers and materials writers have often incorporated such guidelines into their teaching or the design of their classroom materials. Although the guidelines were written with L1 notetakers in mind, they seem to also have relevance for those instructors or materials writers who seek to develop the lecture processing and notetaking skills of L2 learners. In addition, they may even suggest hypotheses for investigation for L2 researchers interested in exploring the impact of the metamemory strategy of lecture notetaking. The guidelines set forth by Hartley and Davies (1978) suggest that teachers:

1. Show notetakers that different styles of notetaking are appropriate to different aims and subject matter. (Good notetakers apparently adjust their notetaking strategies to suit the style of the lecturer, the aim for taking notes, and the subject matter of the lecture.)
2. Make clear the organizing principle of different lectures (e.g. does the lecturer explicitly state the structure of the lecture before beginning with an abstract-like introduction or does the lecturer pose rhetorical questions as organizational cues? (See Gage and Berliner (1975) for an illustration of various organizational schemes often used by lecturers.)
3. Use advance organizers or skeleton notes to make transparent the ideational scaffolding and the bare bones facts of the lecture. Klemm (1976:12) argues that providing skeletal notes frees the student from the need to scribble frantically to get down the material on paper. "By being less swamped with the mechanics of notetaking, students can think more about what is said; they are free to organize thoughts and to analyze the lecture material." This use of skeleton notes and advance organizers may be particularly important for non-native speakers who are struggling both to comprehend the language, and to assimilate the content, of the presentation. Hartley (1976) further suggests that skeletal notes make it easier for students to note down personal reference notes in the margins of the handout, and ensure accuracy of recording detail information. (Phonological difficulty, for example, might cause an L2 learner mistakenly to note down 1980 for 1918 in the notes; with skeletal notes, this problem is eliminated.)
4. Teach students to recognize verbal signposts in a lecture that make evident the structure of the information; teach students, in other words, to recognize rhetorical cues (e.g. repetition of certain phrases that instruct the students about the component parts of a series of ideas).

Gage and Berliner (1975:506) offer an example of a lecturer's use of repetition of relational words and phrases to lay bare the structure of the lecture:

> Teaching can be analyzed in many different ways for different purposes. *It can be analyzed according to* the components of the learning process that it influences, when it is being related to the learning process. *It can be analyzed according to* the time sequence of the logical steps involved, when one is planning a teacher education program. *It can be analyzed according to* grade level or subject matter, when one is planning to speak to teachers of different grade levels or subject matters.

5. Teach students to flag changes of major topics and themes (e.g. "We are through with that topic, now let's turn to the second major theme." Give them practice in keying in on phrases which expose essential content and prompt student attention to particular information (e.g. use of phrases such as "Now note this . . ."; "It is especially important to realize that . . ." (Gage and Berliner, 1975:503).
6. Point out that lecturers often use humour or asides to counter student fatigue and maintain attention on the part of the learner. (Differentiating between asides, jokes, and pertinent information that may be needed for later review is an important notetaking skill.)
7. Allow students sufficient time for notetaking (i.e. refrain from requiring students, particularly L2 students, to take notes on lengthy lectures that are densely packed with information, thereby causing information overload). Lecture samples should be graded in terms of length and information density, and should include examples of verbal fillers, false stops, reiterations and reworking of information by the lecturer. They should not be extended dictation exercises.
8. Encourage students to take notes. Then examine their notes, and provide the students with feedback concerning how they might improve their notes. The teacher's feedback might stress that students:
   a. Use diagrammatic formats for layouts (e.g. in a comparison-contrast section of the lecture, the notes could be framed in a split-page form, and key words could be noted in diagrammatic form).
   b. Write down questions that occur to them about the lecture information while they are listening. They can later ask their professor or their peers for answers to their questions or for clarification of ambiguous pieces of information.
   c. Leave sufficient space on each page of notes to jot down additional information during review of the notes. (The margins of the notebook could serve for this purpose.)
   d. Use some system for highlighting information signalled to be important by the professor or perceived to be significant by the

notetaker. (Underlining, circling, or highlighting could be used for this purpose.)

e. Take full rather than skimpy notes.
f. Consolidate lecture notes with notes taken on a textbook assignment, if possible, in order to create a *gestalt* of information read and heard. Add syntheses and evaluations of the information in the lecture and text.
g. Review the notes to consolidate learning.

Continuing the Research Probe

In 1941 Laycock and Russell examined 38 study manuals and listed the most frequently cited notetaking recommendations. Figure 2 lists, by frequency, their recommendations, many of which apply to notetaking from text.

Many of these recommendations as well as those listed above could form hypotheses that might be tested in research studies. In addition to probing the utility of the guidelines set forth by Hartley and Davies (1978) and Laycock and Russell (1941), Ganske (1981:169) has identified additional questions that could drive L2 notetaking research inquiries. Ganske ponders the following questions.

- What proportion of ideal notes does a student record?
- How are male notetaking behaviors different from female notetaking behaviors (if they are)?
- What is the error rate in notetaking?
- What is the effect of seating position, lecture cues, and serial position on error rate?
- How do notetaking behaviors vary with main ideas compared to examples of specific details?
- Are graduate students better notetakers than undergraduates?
- What trends in notetaking occur across lectures?
- Do students perceive differences in notetaking in terms of encoding function and the storage function (notetaking as process and product)? What is the nature of this difference?
- Do students who process information before recording it have better notes than those who record it verbatim?
- How well do notetaking scores represent knowledge?

To this list could be added the additional questions:

- Are there cross-cultural differences in notetaking styles?
- Are there differing perceptions of the importance of notetaking across cultures?
- Do the axioms of good notetaking hold for L2 notetakers and lecture attendants, or do other axioms apply in L2 notetaking situations?

Few definitive answers to these questions have come from the research investigations conducted to date, though some of these questions have actually been posed in past empirical studies or have been suggested by the findings of L1 notetaking studies. The process and the product of L1 notetaking and, more particularly, of L2 notetaking is today in need of continued and innovative research efforts, both of the experimental and the ecological varieties for until we begin to scrutinize both the notetaking strategies employed, and the content of L2 students' notes, we will remain far from identifying a coherent and relevant set of principles that can be used to guide L2 learners in their attempt to comprehend and retain extended spoken discourse in L2.

Figure 2. Summary of recommendations on outlining and notetaking from books. Taken from 38 study manuals

Recommendation	Frequency
Have a neat and carefully thought-out system for taking notes; that is, new topics on fresh sheet, arrange statements to show the main headings by system of indentation	29
Organize material read under headings and topics	24
Make brief outlines	21
Do not take down everything	19
Get thought units from paragraph heads, topic statements, etc.	18
Use your own words	15
Judge value of the outline	14
Use looseleaf notebook with good size paper	14
Invent and use abbreviations	13
Realize importance of notes	12
Take in full: quotes, unfamiliar material, important facts	11
Understand what you are trying to organize	11
Read, then outline	10
Summarize by underlining	8
Adapt procedure to nature of book and use to be made of notes	7
Put main headings in question form	6
Take points and organize later	6
Realize notes and be accurate	6
Do not have too much detail in summary	6
Skim explanatory material	5
Review notes before filing	5
Realize that written outline is preparation for mental review	5
Use key words	5
Intend to remember	4

Source: Laycock and Russell, 1941 (cited in Ganske, 1981).

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