

Laying the Groundwork For Hypothesis Making in EAP Lecture Comprehension

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Native speakers, when listening to lectures, sift through the information to choose what to listen to, make hypotheses about future discourse, synthesize preceding discourse, and add their own background knowledge. Non-native speakers, too, need to be aware of their active role as listener. They also need to be aware of the fact that their foreign language and foreign culture background may lead them to make predictions and interpret information during an English lecture differently than native English speakers. This article will present relevant theories of discourse processing for native and non-native speakers of English and suggest exercises for non-native speakers based on these theories geared towards awareness and improvement of hypothesis making during lectures.

In order to truly function in a language, a speaker/listener cannot rely solely on a grammatical competence in the language and must instead have a more comprehensive communicative competence in that language-- incorporating assumptions about the speakers and their roles, the speech event, and the underlying assumptions of the culture and language concerning how to use the language to perform particular functions. An academic lecture is a speech event in which the lecturer is attempting to communicate specific ideas to the audience. The audience is generally only involved in the receptive role. Because there is little room for requests for clarification and feedback, the lecture discourse, itself, must provide the information concerning what is meant to be communicated. In some way, a lecturer needs to lead the audience to interpret his/her output in the way s/he has intended. This means helping the audience follow his/her train of thoughts--his/her organization patterns, his/her hierarchy of information importance, his/her assumptions about the workings of the world, and ^{his}/_{her} assumptions about how language serves to express those assumptions.

This article will focus on the processes the listener must go through in order to reconstruct this train of thought. First, research in connected discourse processing will be discussed with extra attention placed on the

implications of this research for non-native speakers (NNS) of English. Lastly, suggestions will be presented as to how knowledge of discourse processing can be applied in an EAP lecture comprehension pedagogy to help students be more aware of their role as an active listener.

1. Research in Connected Discourse Processing with Implications for EAP lecture Comprehension.

Much research has been done to answer the question "what goes on in the listener's mind as s/he processes connected discourse for retention?" One of the first researchers to deal with this question was Bartlett (1932). He felt that researchers had to account for the fact that when a passage was recalled, it was not reproduced exactly but was rather reconstructed in the light of a person's "schema" at the time of recall. This concept of listening being a process of reconstruction based on the listener's own expectations and analysis and requiring the listener's own inferences has resulted in what may most generally be called "schema theory". Adams and Collins (1979:3), describe "schema theory":

A fundamental assumption of schema-theoretic approaches to language comprehension is that spoken or written text does not in itself carry meaning. Rather, a text only provides directions for listeners or readers as to how they should retrieve or construct the intended meaning from their own, previously acquired knowledge. The words of a text evoke in the reader associated concepts, their past interrelationships and their potential interrelationships. The organization of the text helps the reader to select among these conceptual complexes. The goal of schema theory is to specify the interface between the reader and the text--to specify how the reader's knowledge interacts with and shapes the information on the page and to specify how that knowledge must be organized to support the interaction.

Obviously, the listener is not a passive receiver. While listening, s/he is constantly recreating the text.

One type of "schema" research is Van Dijk's (1977a, 1977b) "theory of macro-structures". Van Dijk suggests that information processing involves the retrieval of the "macro-structures" of the discourse. (These "macro-structures" may be more commonly regarded as "topic" or "theme".) According to Van Dijk, a complete discourse comprehension model would activate knowledge of "frames" (units or concepts that are typically related), knowledge of super-structures (the functive use of the discourse e.g. narrative, argument, advertisement), inferences based on frames and super-structures, ^{and} application of macro-rules (of generalization of information, deletion of information, integration of information, and construction of information) to deduce the macro-structure of the discourse.

As Tannen (1979:138) says, "terms such as 'frames', 'schema', 'scripts' ... all amount to structures of expectations... based on one's experience of the world in a given culture, one organizes knowledge about the world and uses this knowledge to predict interpretations and relationships regarding new information, events, and experiences". Examples of "frames" are "how people look and behave" or "what the geography of the world is". In an "eating in a restaurant" frame, in American culture, there would be subsets including "eating in an expensive restaurant" and "eating in a diner". Further along in the hierarchy of information of the frame "eating in a diner" would be the concept of "eating at a counter", "tipping the waitress", "reading the newspaper over coffee". Van Dijk (1977b) treats these "frames" as being a hierarchy of facts, assumptions, propositions, expectations of actions and objects, all of which are stored in semantic memory.

Winograd (1977:81) defines three types of discourse schema:

- (1) interpersonal schema - conventions for interactions between the participants in a communication.
- (2) rhetorical schema - conventions for laying out a reasoning sequence which the speaker wants the hearer to follow.
- (3) narrative schemas - conventions for connecting a sequence of utterances into a coherent text.

In most discourse, all three of these schemas are working at the same time. During a lecture, for example, not only are there conventions for laying out a reasoning sequence, but there are also rules of lecturer-student interaction and rules for connecting the logical sequence of utterances within the larger lecture discourse organization.

What then does the listener do as s/he processes connected discourse according to schema theory?

A receiver strategically attempts to develop a message theme as soon as possible. The developed message theme serves as an organizational criteria for relating propositions to one another. It also serves as a retrieval cue to assess prior semantic memory schema and to decide if a message is complete and ready for long term semantic memory storage. (Housel and Acker, 1979: 28)

Adams and Collins (1979: 5) say that "every input event must be mapped against some schema and all aspects of that schema must be compatible with the input information". Connected discourse processing, then, is very much a matter of hypothesizing and assessing these hypotheses against the incoming information. Two processes in particular take place. One process is "bottom-up processing" which is evoked by the incoming data and tries to find more general schema that encompass the incoming information. The second processing strategy is "top-down processing" which tries to find lower-level schema that confirm hypotheses already made.

This concept of the listener first hypothesizing a message and then later assessing the hypothesis is the basis of Halle and Steven's (1967) 'analysis by synthesis' model of connected discourse processing. This model proposes that the listener generates internally a match for the speech s/he hears, a match that is constantly refined by testing it against incoming information. Halle and Stevens propose two stages in their model: stage one being a period of preliminary analysis and hypothesis finding; stage two being a period of synthesis and hypothesis testing. Oakeshott-Taylor (1979) posits a third stage of storage of semantic content of passage and integration with the content of previously heard ideas.

Freedle (1972:183) expands on this notion of hypothesis formation and testing when he states that "the relative difficulty we have in isolating the relevant topic of conversation is related to the size of the set of possible alternatives that we believe might be discussed under a given set of circumstances". If the set of possible alternatives is too wide, possibly due to cultural differences and different expectations, the receiver will have more difficulty with hypothesis formation and testing because his/her chances of forming incorrect hypotheses are greater and his/her chances of not finding that the incoming information is fitting into the hypothesized structure are greater. Freedle later says that those with too narrow a set of alternatives have great problems because they may feel that it is the lecturer who is making an error in topic or who is "wandering" off the topic .

Rivers (1966) attempts to deal with the problem of the ESL student's having too great a set of alternatives on the lexical and syntactic level. She suggests that those factors which reduce the possibility of occurrence of any particular word or idea should be pointed out and practiced. These

factors could be syntactic relationships (e.g. the necessity for a noun phrase following a determiner), combinations of words of high frequency (e.g. as a matter _____ where 'of fact' or, 'of course'^{are} the only reasonable alternative), or clichés (e.g. where there's a will, _____ where 'there's a way' is the only reasonable alternative.)

What unifies all of these branches of research is the idea that people do not receive information into an empty receptacle. Rather, the receiver imposes organization and unspoken ideas onto the input. This imposition arises from the receiver's accumulated knowledge of how the world works and how speech is used to express how the world works. Tannen (1979: 144) notes how this imposition not only aids interpretation but also may shape different interpretations:

This prior experience or organized knowledge takes the form of expectations about the world, and in the vast majority of cases, the world, being a systematic place, confirms these expectations, saving the individual the trouble of figuring things out anew all the time... At the same time that expectations make it possible to perceive and interpret objects and events in the world, they shape those perceptions to the model of the world provided by them... Thus, structures of expectation make interpretation possible, but in the process they also reflect back on perception of the world to justify that interpretation.

Our assumptions about the world are so deeply ingrained as undeniable "facts" about the world that it may be virtually impossible to see the world and its organization in a different way.

For the ESL student who is called upon to interpret connected discourse in a foreign language, this research may have relevance. The student may need to recognize and make the appropriate assumptions about super-structures in the foreign language. Kaplan (1966) discusses the idea of "contrastive rhetoric", the assumption that different cultures expect and call for a different system of presentation to get ideas across.

According to Van Dijk (1977b: 154) macro-categories (e.g. setting, resolution, episode in the super-structure of a narrative) "dominate sequences of propositions of the narrative discourse" and so, are the building blocks of interpreting a narrative. Listeners from cultures in which the macro-categories are different or very differently expressed may impose the wrong interpretation on the narrative or might end up totally confused at the seeming illogicality of the input.

On a lower level of interpretation, the ESL student must develop a source of "frames" similar to those assimilated by the native English speaker. Awareness of the "pictures" that come to mind when a certain topic is raised will lead to greater equivalence in background knowledge among native speakers (NS) and NNS. Rather than taking for granted that the NNS knows the implications of a topic, more attention needs to be placed on the cultural presuppositions about that topic. In terms of vocabulary, too, implications need to be discussed. Discussion of a character who is "begging" needs to include the presupposition that in American culture, "begging" denotes need or cunning, that it is a degrading practice, and that it is looked upon as a nuisance.

Attention also needs to be focussed on predictive assumptions at the word and syntactic level. Predictions of what grammatical form can fit into a certain slot need to be practiced. Awareness of lexical "chunks", words that always come together, need to be introduced. Awareness of clichés and cultural "proverbs" need to be dealt with.

The strategy that most needs to be worked on in the ESL classroom, then, is the making of correct hypotheses or at least, the making of incorrect hypotheses that can be refined by incorporation of preceding or incoming data leading to correct hypotheses. This hypotheses making can

be practiced on all levels of discourse: on the lexical level, the syntactic level, and most importantly for lecture discourse, on the discourse level of overall organizational patterns. The remainder of this article will focus on specific exercises to make students aware of the need for hypothesis making, to make students aware of the possibility of different hypothesis making due to different cultural backgrounds, and finally, to practice hypothesis making.

2. Pedagogy for Training Hypothesis Making in EAP Lecture Comprehension Classes

In the first and second exercises, lecture transcripts are used so that students see and discuss in concrete terms what is taking place during the lecture. The first exercise uses a complete transcript; the second exercise uses a transcript with words and ideas omitted. The third exercise aims at introducing students to non-linguistic cues to emphasis, de-emphasis, and organization. In the fourth and fifth exercises, students are listening to lecture segments and predicting lecture direction and discussing how they made their predictions. In the sixth exercise, students are listening to lectures with attention focussed on the overall discourse structure.

The following directions are handed out for the first lecture transcript analysis. It is stressed that there are no absolute answers and that the purpose of the exercises is discussion.

1. Circle all cues. (Cues tell you what to look at, what is important, what the organization is, what information is coming next, etc. Cues do not give facts. Examples of cues are "Let's take a look at ...", "Next...", "Now..." etc.)
2. Bracket [] all references (e.g. [from this point of view]).
3. Cross out all repetition, paraphrase, secondary detail (examples, clarification, expansion) and tangents.

Below is a sample of how one transcript might be analyzed.

Lecture Transcript - Language

let's first look at one aspect of language.. I want to look
cue to topic introduction *cue to topic introduction*

at the sociological or sociolinguistic way of looking at
cue to beginning a topic ???

language... all right from this point of view some linguists
cue to beginning a topic ???

have come up with the idea that language is a game...like
~~football, soccer, baseball...~~ each person who speaks in any
particular language or any community knows all the rules of
this game...~~they know how to play...~~ somebody who comes from
a different one ~~as you know well~~ may not know all the rules
so you have some problems with communication.. *cue ???* now because
we said language is a game doesn't necessarily mean that we
play it for fun...we usually play it for very serious reasons...
most of the time...~~although sometimes we do play it for fun...~~
~~sometimes we tell jokes and things like that... hmmm...~~ but
the rules...no matter what we do are very well defined...~~you
may not know what they are but they're very clear rules of
what you can do and what you can't do in any situation...~~
usually in any use of language people are trying to accomplish
something...~~trying to do something...~~ that's why they talk...
~~sometimes you just talk to yourself for no reason... some-
one's people talk for no reason but most people talk because
they want to accomplish something.~~ *cue of emphasis* basically some linguists
have set up *cue of organization* five categories of accomplishing things...we use
language to describe...~~tell about the world that we see...
there's a chair over there... there's a person over here...
someone is from China... or whatever...~~ *cue of organization* another thing that we
use it for is to tell people to do something...~~please close
the door... please open the door... do your homework... do this...
do that.~~

It is hoped that students would come out of a discussion based on the transcripts with the knowledge that there is a "method to the madness" and that it is within his/her reach. A primary benefit from this analysis is thus psychological--the student feels that there is a way to listen to a lecture and that there is some means by which s/he can learn how to listen. A teaching benefit is that a framework for discussing lectures, notes, listening

like a game in that A) sense ... A) important thing is
B) way ... B) another

of course like I said, you're out to win something just like
A) in any other game we do
B) you want to win the game you want to kick the ball in
the goal ...we're usually
out to accomplish something...something tangible...A) required
B) -
or something intangible, like emotional satisfaction...
something to that effect...OK...another thing A) concerning
B) to notice

A) language
B) - is that everybody has his own style of
A) play A) players have different styles
B) doing things like B) A goes to bed early; B takes
of playing games
a bath at night etc. just like
that some speakers are very good at certain ways of speaking
and have certain individual styles of speaking...everybody is
A) different
B) speaking in his own style nobody speaks the
same...also, like a soccer player or like any game player you
can change your style... A) similarly, you can choose your
B) -
A) style of play
B) - ...so styles change as well
as the fact that each person has his own style...

This exercise when done in groups provokes a lot of discussion and serves to put into practice ideas that were discussed theoretically in the first exercise using complete transcripts. The teacher's role in this activity is to get students to see what cues they used to predict what was coming. Where students can't predict, the teacher can discuss concepts of repetition, parallelism, reference, repeated organizational patterns (such as repeatedly making a statement and then comparing it to a sports game), clichés, etc. The teacher need not correct students or even provide "answers" except where the student's answer is illogical in terms of meaning.

The third exercise, designed to decrease student's dependence on listening to every word, is to show a video tape of a lecture (5-10 minutes) and have students mark down or discuss any non-linguistic or paralinguistic cues of emphasis or non-emphasis they notice or hear. The goal here is to get students to be looking beyond the words, not necessarily to come up with an uncontestable rule.

In the preceding exercises the students were introduced to the concepts of cues, organizational patterns, redundancy, expansion, and paraphrase by looking at transcripts--a concrete representation of the sounds and words that pass by quickly when spoken. In the next group of exercises the students begin to listen, still noting cues, organizational patterns, redundancy, etc. but are now not relying on text. At this point, practice begins in prediction, first on a one or two utterance level (utterances being marked by falling intonation or major junctures) and subsequently, on a larger segment level (continuous discourse of 1-3 minutes).

Practice in hypothesis making on the one or two utterance level is designed to introduce the students to the concept of discourse coherence. Words are not interpreted in isolation but must be related both backwards and forwards to other information in the discourse. This exercise begins by taping a lecture and playing it back in segments constantly stopping and asking: Where is the speaker heading (in a general sense)? What will come next? How do you know? Is this important information? An ideal interaction is demonstrated below. (In the classroom, the teacher would most likely give more clues to elicit these ideas and would probably give many of his/her own ideas and analyses.)

Lecture Segment Teacher-Student Interaction

Let's turn to
the Tao Te
Ching itself...

T: Where is the speaker heading?
S: He'll look at what's in the book...
the ideas in the book...
T: What will come next?
S: one main idea from the book? the
first page of the book? the book's
organization?
T: How do you know?
S: "turn to the book itself"...so he's
not talking about the background of
the book...he wants to look at the
content of the book...
T: Is this important information?
S: Yes...the lecturer is telling us his
focus...directing our attention...

now...the center
of this book is
in this word
"Tao" (written on
board)...this is
the heart...

T: Where is the speaker heading?
S: he wants to talk about what "Tao"
means...wants to talk about how whole
book relates to "Tao"
T: What will come next?
S: a definition of "Tao"?...what "Tao" is?
T: How do you know?
S: he uses words like "center", wrote
the word on the board...stresses "this
is the heart"
T: Is this important information?
S: yes...further subcategorizes topic
from Tao Te Ching to "Tao"

so...if you can
know what this
word is trying
to say...and the
way you know it
is not by sitting
down and intel-
lectually grasp-
ing...

T: Where is the speaker heading?
S: ...how can you know what this word
means...
T: What will come next?
S: he says the way is not by sitting
down and intellectualizing...must
be by feeling...
T: How do you know?
S: first he says we can know what "Tao"
is but then he tells us how not to
find out...he must intend to tell us
later how we can find out...
T: Is this important information?
S: maybe...it seems that the important
information will come...this is
leading up to it...

On a larger segment level, a lecture may be broken down into one to three minute segments. Again, the students will be asked to predict where the speaker is heading, to predict what will come next, and to describe how they have arrived at those conclusions. Two segments from a larger lecture on earthquakes follow.

1. What I'd like to talk about today is earthquakes--what scientists know or think about the causes of earthquakes, what developments have occurred concerning the prediction of earthquakes. As you may already know, earthquakes are one of the most unpredictable of natural occurrences. Most often, they strike without specific warning. One such unexpected earthquake occurred in Italy in December 1980; another occurred in Algeria in October 1980. In 1976, an earthquake measuring 8.2 on the Richter Scale occurred 90 miles southeast of Peking, killing as many as 650,000 people. This earthquake also had caught seismologists by surprise. It almost seems that at the present level of research, nature always surprises man.

2. Even so, as time passes, the earth's behavior is becoming much less mysterious. Less than 300 years ago, as late as 1750, the Bishop of London told his followers that two recent quakes had been warnings from an angry deity. Today, scientists, thinking that they're somewhat closer to an answer, prefer another explanation. This explanation is known as the theory of plate tectonics (write on board).

At the end of segment #1, the teacher might ask the students where they think the talk is heading. They will probably predict that the next segment of the lecture will begin with either the causes or prediction of earthquakes. The teacher should accept any logical possibility. The goal is to have students feel free to guess. Instead of going directly into all of segment #2, the teacher may begin slowly with perhaps only the first sentence, allowing students to modify their original guesses. For example, the lecturer begins segment #2 with "Even so, as time passes, the earth's

behavior is becoming much less mysterious." The teacher may again ask if there are any predictions of lecture direction. She may point out the cues "even so" (a cue that the following information is a contradiction or a qualification of the previous statement that "nature always surprises man") or the cue "as time passes" (a reference to time up to the modern day). Students may be able to guess that the talk will continue about theories of earthquake causes or prediction in the past to the present. This type of questioning would be repeated throughout a complete lecture.

Lastly, students need a basis for being able to predict the overall design of the lecture. By making students aware of traditional rhetorical plans and asking them to see whether and how a lecture fits into this plan, students are again building up their intuitions about how lecture discourse is organized in English.

A sample framework could be as follows. This framework is for an "inductive" lecture style. In this style, the main point of the lecture is stated at the end in the form of a conclusion. Until the end, the listener must follow the author's line of thought, expecting conclusions at the end to tie together all of the anecdotes, narratives, test descriptions, etc. in the body of the lecture.

Inductive Organizational Style

Introduction (optional):

Topic that needs to be dealt with; statement of a problem:

Anecdote(s), narrative(s), test description(s), observation(s) concerning topic or problem:

Conclusions based on the above anecdote(s), narrative(s), test description(s), observation(s):

Summary of points covered (optional):

Being aware of this model style, students have a greater chance of being able to accurately predict discourse direction. They will be able to say with more authority that given what the lecturer has already stated, s/he will probably continue in a certain direction.

3. Conclusion

This article discussed the relevance of theories of discourse processing and the relevance of discourse analyses to EAP lecture comprehension pedagogy. Studies in the discourse of lectures provide the teacher with an awareness of what might be taking place during lecture discourse and can serve as guidelines to classroom teaching with the assumption that "identifying strategies of interpretation can both serve to elucidate discourse as well as act as a language learning objective" (Candlin 1978: 40). These strategies of interpretation include awareness of cohering and cohesive devices of lectures (lexical, syntactic, and paralinguistic) as well as an awareness of devices that serve to emphasize information (lexical, syntactic, paralinguistic, and organizational cues). It should be noted, however, that the teaching of lecture comprehension cannot be accomplished solely by analyzing the strategies of listening. Input and practice must be extensive, with discussion of strategies serving to facilitate and impose order on incoming information.

Studies in the cognitive processes involved in lecture comprehension and note-taking are further removed from actual classroom interaction than are discourse analyses. However, models of comprehension such as "schema" models, "analysis by synthesis" models, and "depth of processing" models do provide the teacher with a knowledge of why s/he is teaching what s/he teaches. Hypothesizing that comprehension involves mapping incoming information against some schema presupposes that the listener's schema is compatible or flexible

enough to incorporate the lecturer's schema. Hypothesizing that comprehension is a process of analysis and hypothesis finding and testing suggests the importance of guessing and predicting when listening to lectures. An awareness of how culture may affect the mapping process or the hypothesis finding and testing process suggests the need to expand the NNS's cultural awareness by giving context to topics and elucidating various assumptions that NSs would make while listening to a lecture.

The exercises presented in this article are based on theories of what occurs when listening, yet no empirical tests have been done to determine which strategies and exercises are, in fact, used by and useful to the student when s/he listens to lectures. These exercises do, however, provide the students with a stronger base in knowing what s/he needs to do when listening, and provides the teacher and students with a clearer view of the ultimate goal and the steps and reasons for each step leading to that goal.

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