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Applying Aspects of the Cognitive Theory to L_2 Learning: Focus on Training Transfer

Hosney M. El-daly

Associate Professor of Linguistics
Department of Linguistics
Faculty of Humanities and Social Sciences
United Arab Emirates University
P.O.Box: 17771, Al-Ain, U.A.E.

ABSTRACT: *One of the major issues that has been the focus of much SLA research is "Is SLA unconscious in the way L_1 acquisition seems to be?" The controversy over conscious versus unconscious learning has been at the heart of much debate in the field of L_2 acquisition. Although this debate has attracted a growing number of researchers, one area of worthwhile research that has received minimal attention is the effect of learners' training on their ability to notice linguistic forms and meanings, which, in turn, may affect the rate of development of their metalinguistic knowledge. On the other hand, listening comprehension has been characterized as a highly-complex problem-solving activity that can be broken down into a set of distinct subskills.*

With this theoretical background in mind, the present study reports the results of an experiment conducted on 200 learners of English as a second language. It attempts to answer three interrelated questions: (1) to what extent does the advanced students' performance in listening tasks differ from that of the beginning students before and after training?; (2) how can two types of training (intensive listening vs. improving learners' linguistic skills) affect L_2 learners listening comprehension skill?, and (3) what does students' performance, before and after training, tell us about their abilities to transfer?

The instruments used are (1) pre-test; (2) classroom instruction sessions; (3) post-test, and (4) interviews. The data analysis has a quantitative and a qualitative, interpretative part. Results are obtained and discussed, and pedagogical applications are suggested.

Key words: *cognitive theory; L_2 listening; Training transfer*

Introduction

One of the major aims of education, whether stated explicitly or implicitly, is to increase students' ability to competently interact with a varied and changing world. To meet this goal, students must be able to appropriately transfer knowledge and skills acquired in one setting to

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another. Therefore, psychologists and educators have long been interested in understanding how people learn, for the concept of learning is central to many different human endeavors. The problem, however, is threefold: 1) given the central importance of transfer in our educational system, it is surprising that relatively little attention has been paid to this issue by educational and psychological researchers, and linguists, as well. 2) as we think about our experiences as teachers and researchers and examine our beliefs about the learning process, it becomes clear that we have no all-encompassing theory of language acquisition that matches what we have learned from experience. Rather, we find a great deal of research on small parts of the total picture without an integrated theory to guide our work. In this connection, Hatch, Shiari, and Fantuzzi (1990: 697) argue that "there is no theory that integrates all areas of language acquisition. Because each researcher must limit the scope of his or her research, the questions asked and answers sought are almost always about one separate subsystem of the total picture". The third aspect of the problem we are encountering is that theories of how second languages are learned have been approached from a variety of perspectives: sociolinguistic, educational, neurolinguistic, psycholinguistic, and linguistic. "Because of this diversity, it is often difficult for researchers from different traditions to communicate with one another or to fully appreciate the significance of the questions being addressed (Gass, 1989: 6) Relatedly, McLaughlin (1987: 6), correctly, points out that "disciplines tend to become fragmented into 'schools', whose members are loath to accept, and are even hostile to the views of other schools using different methods and reaching different conclusions. Each group becomes convinced that it has a corner on 'truth'. Instead, it should be kept in mind that 1) linguistics is only one of the disciplines that second language acquisition research can draw on, and "multiple sources of information are needed to build up a picture of the language knowledge in the mind" (Cook, 1993: 269). 2) As McLaughlin (1987: 6) argues, "multiple ways of seeing result in multiple truths... there is no scientific truth... Scientific progress is achieved as we come to illuminate progressively our knowledge in a particular domain by taking different perspectives, each of which must be evaluated in its own right".

Specifically speaking, the field of linguistics and cognitive psychology contain separate paradigms for describing second language acquisition. As Spolsky (1985) points out, linguistic theories assume that language is learned separately from cognitive skills, operating according to different principles from most learned behaviors. As O'Malley, Chamot and Walker (1987: 288) point out, "this assumption is represented in analysis of unique language properties such as developmental language order, grammar, knowledge of language structures, social and contextual influences on language use, and the distinction between language acquisition and language learning. Language and linguistic processes are often viewed as interacting with cognition but nevertheless maintaining a separate identity that justifies investigation independent from cognitive processes". In addition, theory development in second language acquisition that addresses cognitive processes remains limited despite recent interest in the relationship between language and cognitive processes.

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The Subjects

The present study reports the results of an experiment, which was conducted on 200 learners of English as a foreign language. The first group (Beginners) consisted of 100 first year students in the department of English, at the Faculty of Education, Minufiya University, Egypt. The second group (Advanced) consisted of 100 fourth year students in the same department. Each group will be divided into two sub-groups: one group will be given visual training and the other group will be given auditory training.

Hypotheses

It was hypothesized that advanced students' performance before and after training would be better than that of the beginning subjects. This may seem natural because of the seemingly advanced linguistic abilities of advanced students in comparison to those of the beginning students. In addition, it was hypothesized that intensive listening training would be more beneficial than visual training for both beginners and advanced students. Finally, it was hypothesized that advanced students would be able to transfer their learned knowledge, which they had obtained throughout the training sessions, to the actual task of listening. This ability of transfer may explain why advanced students would be better performers than the beginners, regardless of their linguistic level.

Instruments

The instruments of this study consisted of four tasks:1) pre-test; 2) classroom instruction sessions; 3) post-test, and 4) interviews. The pre-test was made of 30 questions of part (A) from a TOEFL test; listening comprehension section. Each Correct answer was worth one point. Having accomplished the above task, the subjects were asked to truthfully report on their performance. Specifically, they were asked to pinpoint the problems they faced while working on the pre-test, and the strategies they used to overcome these problems. The subjects were asked to come the next day following the pre-test to attend a group discussion on the test they had taken the other day. Each group (either "Beginners or Advanced") was distributed into two sub-groups; one group attended a visual training and the other sub-group attended an auditory training. Each student in the auditory groups was given intensive exposure to the listening material of the pre-test. This session took place in the language lab, in which the auditory group had a chance to listen repeatedly to the listening material. The auditory training continued as long as students want. In the end of the session, students were asked if they want to listen more; and their answer was simply "we are ready for the test". However, to be sure that the students had enough auditory training, they were asked to come the following day for further training. No discussion or explanation of the listening material was provided; the focus was mainly on just listening. Each student in the visual training groups had a copy of the sentences and conversations of the pre-test. Together we discussed them, and the purpose was to get them familiar with the vocabulary, grammatical structures, and to answer any question related to the linguistic aspects of these sentences and conversations. No student was allowed to take the

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papers home. In the post-test session, the subjects in both groups were asked to work on the test used before. To be sure that their performance reflects their listening ability, the order of the sentences and conversations was changed before the post-test began. Also, the post-test was given one week after the training sessions to reduce any reliance on memorization. Finally, each student in both groups was interviewed to explain his /her performance in the post-test. I interviewed the students individually. Conducting the interview with each subject took about one hour and half. During the interview, students were asked to explain why certain answer was made. No feedback on the correctness of their responses was given before the end of the interview. Students' explanations were tap-recorded and transcribed.

Data Analysis

The data analysis had a quantitative and a qualitative, interpretative part. The quantitative part consisted of a descriptive statistical comparison of the number of correct responses in the pre-and post-tests. The T-test was applied to determine the significance of differences among means. The qualitative part was an analysis of each student's performance in the pre-and post-tests. The analysis was inductive, based on the individual's explanations, and aimed at accounting for the differences between the tasks.

Theoretical Framework

Before Chomsky, linguistics tended to be a taxonomic enterprise, involving collecting a body of data (utterances) from the external world and classifying it without reference to its source, the human mind (Carston, 1988). Since Chomsky, "linguists have thought of themselves as investigating mental representations and rules, and thus as engaged in a branch of theoretical cognitive psychology. Chomsky himself characterized the study of generative grammar as having effected a shift of focus in language study from E-language (= externalized language) to I-language (= internalized language), that is, "from behavior or the products of behaviour to states of the mind / brain that enter into behaviour" (Chomsky 1986: 3). On the other hand, cognitive approaches to L_2 acquisition see L_2 acquisition as a complex cognitive skill. As Schulz (1991: 19) points out "rather than stressing innate, universal linguistic processes, affective factors, input, or interaction as causative factors for L_2 development, cognitive theory sees L_2 acquisition as a mental process, leading through structured practice of various component subskills to automatization and integration of linguistic patterns" (See Al-Hinai, 2006; Bardovi-Harlig, 2006; Beare & Bourdages, 2007; Brown, 2009).

Literature Review

Listening comprehension: its importance/Nature

The endeavor of today's communication scholars and SLA researchers to penetrate and illuminate the mental processes involved in comprehending discourse spoken in one's native language (NL) or second / foreign language (L_2) is a quest that has engrossed philosophers since ancient times, has absorbed psychologists and speech communication scholars since the early

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part of the 20th century, and, more recently, has captured the attention of SLA researchers and practitioners of English as a second language as well as English as a foreign language. The study of listening comprehension has, in fact, become a polestar of second language acquisition theory building, research and pedagogy. According to Dunkel (1991), a major catalyst for the relatively recent and intense interest in listening comprehension research has been the realization and accumulating evidence that input plays a critical role in second language acquisition. In this regard, Long (1985) points out that current theories of second language acquisition, such as the information processing model (McLaughlin, Rossman, & McLeod, 1993), monitor model (Krashen, 1977), the intake model (Chaudron, 1985), the interaction model (Hatch, 1983), all emphasize the key role listening plays in the development of a learner's second / foreign language, particularly at the beginning stages of language development.

Not only is listening comprehension important at the beginning stages of SLA, it appears to be crucially important for advanced-level learners (Power, 1985). Peterson (1991: 106-107) maintains that no other type of language input is as easy to process as spoken language received through listening. At the beginning stages of language study, before students have learned to read well, it is by listening that they can have the most direct connection to the meaning of the new language. They can use spoken language to build an awareness of the interworkings of language systems at various levels and thus establish a base for productive skills. At the intermediate level, when students are refining the grammatical system of the language, listening can be used to stimulate awareness of detail and to promote accuracy. At advanced levels, when written language becomes a viable source of input, a regular program of listening can extend the limits of learners' vocabulary and use of idioms, and build their appreciation for cultural nuances. Now, many contemporary foreign language educators and researchers regard comprehensible input (written as well as spoken) as essential to developing the ability to produce the target language fluently. Accordingly, listening comprehension has become the foundation of a number of theories of second language acquisition that focus on the beginning levels of second language proficiency. The primary assumption underlying these theories is that language acquisition is an implicit process in which linguistic rules are internalized by extensive exposure to authentic texts and particularly to comprehensible input that provides an appropriate level of challenge to the listener (See Centeno-Cortes & Jienez, 2004; Cohen, 2008).

Current understanding of the nature of listening comprehension draws on research in psycholinguistics, semantics, pragmatics, discourse analysis, and cognitive science. However, there is little direct research on second language listening comprehension. It may be pertinent, then, to look to the NL listening research literature for help in identifying some of the factors that seem to influence comprehension of L_2 discourse. According to Clark and Clark (1977:49), the following processes appear to be involved in comprehension: (1) The listener takes in raw speech and holds an image of it in short-term memory, (2) An attempt is made to organize what was heard into constituents, identifying their content and function, (3) As constituents are identified, they are used to construct propositions grouping the propositions together to form a

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coherent message, (4) Once the listener has identified and reconstructed the prepositional meanings, these are held in long-term memory, and the form in which the message was originally received is deleted.

Foder, Bever, and Garrett (1974) suggest that native language words are held in short-term memory only long enough for the listener to organize them into clauses and to extract the meaning that they convey. As soon as the listener has interpreted the clause, the elements that made it up are purged from memory in order to make room for incoming sounds. Foreign language input seems to be processed in the same way, but, as Rivers and Temperley (1978) point out, short-term memory for target language words is often overloaded. Causing words to be purged before they can be organized and interpreted. Thus, even though language learners may be able to recognize each word of an utterance as it is spoken, they may not be able to hold lengthy utterance in mind, long enough to interpret them. Since most learners experience this frustration in learning to communicate orally in a foreign language (Loe 1984, Rivers 1972), an understanding of this relationship is important for the purpose of improving instruction (See Conley, 2008; De Keyser, 2003; Echevarri et al., 2004).

Short-Term Memory and Language Comprehension

The act of listening to and understanding a spoken language can be described as a series of processes through which the sounds associated with a particular utterance are converted into meaning. As the sounds impinge on the auditory system of the listener, they are briefly retained (for about one second) in a sensory store called echoic memory (Loftus and Loftus 1976). At this point, the listener imposes order on this succession of sounds by means of previously learned patterns which segment the sound stream of the language into meaningful units. Once the patterns that the sounds form have been recognized, they pass into short-term memory, usually in the form of words. The capacity of short-term memory is limited to about seven units, plus or minus two (Miller 1956, Klatzky 1975). The definition of a unit varies with the type of input and also with the listeners' previous experience in dealing with the particular type of material that they are processing. For example, if a series of letters of the Roman alphabet were presented in random order to native speakers of English, they would be able to recall only about seven, plus or minus two letters. If, on the other hand, the letters were presented so that they could be patterned into English words, listeners would probably be able to group the letters into meaningful units according to their previous knowledge of English sound-symbol correspondence.

In language processing, units are usually defined syntactically as words, phrases, or clauses. Once sounds have entered short-term memory and have been patterned into appropriate syntactic units, they are retained only long enough to be interpreted semantically before they are purged from memory in order to make room for new input. The information that they carried may or may or may not pass into long-term memory, but the exact words in which the information was expressed are seldom retained for a long period of time. Once the meaning has

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been extracted, the exact words are forgotten. Jarvella (1971) offers evidence that only the last-heard sentence (or clause, if the sentence is lengthy) can be recalled verbatim. Thus, short-term memory, by using syntactic rules to chunk incoming linguistic data, plays a central role in the extraction of meaning and potential long-term retention of meaning from spoken language (See Ellis, N., 2002, 2005; Ellis, R., 2006).

Attention: What is it?

Attention is one of those psychological topics that everyone has intuitions about, but few know exactly how to define precisely. Although discussed by James (1890), it was long ignored in the behaviorist era as being too mentalistic and unobserable to be worthy of study in scientific psychology. In the 1950s and 1960s, however, there arose a resurgence of interest in studying attention, primarily by several British researchers, notably Broadbent (1958); Treisman (1964), and Cherry (1953).

Many of the contemporary ideas of attention are based on the premise that there are available to the human observer a myriad of cues that surround us at any given moment. Our neurological capacity is too limited to sense all of the millions of external stimuli, but, even were these stimuli detected, the brain would be unable to process all of them (Solso, 1991). Generally, attention has been conceptualized in two ways. First, it has often been considered as a state of concentrating on something. In this tradition, James (1970/1890) called attention the "focalization of consciousness". As a state, it has some similarities to other psychological states, such as emotions like anxiety or happiness, which are also not directly observable, but rather must be inferred from behavior. An alternative way to conceptualize attention is as processing capacity, which can be allocated in a variety of ways to different stimuli and activities. In this regard, Leahey and Harris (1997: 109) maintained that "the concept of time-sharing is useful here. A finite amount of capacity (attention) exists that may be allocated or time-shared among the various stimuli and activities demanding attention. According to James (1970/1890: 403) "attention is the taking possession of the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thoughts... It implies withdrawal from some things in order to deal effectively with others" (See Eskildsen, 2008; Jiang, 2007).

Studies of attention fall into two broad classes, which are concerned respectively with divided and with focused or selective attention. Divided attention tasks used to establish limits to performance and to measure the extent to which different tasks can be combined without loss. They are also used to analyze the causes of dual-tasks decrements and to locate the stages of processing that limit performance. Tasks of selective or focused attention are used to study resistance to distraction, and to establish the locus beyond which relevant and irrelevant stimuli are treated differently. As Dodd and white (1980: 14) argue. "Attention... involves a selection of information [which] is often related to central processor control, depending on specific goals and plans, certain information will be selected and other information rejected". According to Leahey and Harris (1997:109), how we select activities to attend to and how we determine how many

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stimuli we can process simultaneously depends on a variety of factors: 1) the number of sources is important; that is, it is harder to pay attention to five people talking than it is to one; 2) the similarity of sources is important; that is, "some people find that they can study well with instrumental music in the background, but not with vocal music. The latter, being linguistic, is similar enough to reading to interfere, while purely instrumental music in not."; and 3) the complexity of sources or tasks is another important variable; that is, it is much easier to pay attention to several simple stimuli or simultaneously perform more than one simple task than it is if the stimuli or tasks are complex. To sump up this section, Haberlandt (1997: 64) points out that "Attention plays a role in perception and performance, even though we may be unaware of it. We become aware of its role, however, when a stimulus is difficult to perceive. When we execute two tasks simultaneously, and when we face an overload of information" (See Hoey, 2007; Gass & Makey, 2011).

Our attentional system performs many functions other than merely turning out familiar stimuli and turning in novel ones. The four main functions of attention are1) selective attention, in which we choose to attend to some stimuli and to ignore other; 2) vigilance, in which we watchfully wait to detect the appearance of a particular stimulus; 3) search, in which we actively seek out particular stimuli, and 4) divided attention, in which we prudently allocate our available attentional resources to coordinate our performance of more than one task at a time.

SLA Research on Attention and Noticing

Over the past two decades, researchers in the field of second language acquisition (SLA) have become increasingly interested in concepts traditionally associated with cognitive psychology such as memory, learning ability, and connectionism. Ellis (2002:299) points out, "we are now at a stage at which there are important connections between SLA theory and the neuroscience of learning - and memory". The concept of attention has become especially important because of its crucial role in so many aspects of SLA theory such as input, processing, development, variation, and instruction (Lightbown and Spada, 2006). The noticing hypothesis seems to have been motivated by a seminal study by Schmidt and Frota (1986), which documents the role of noticing for a beginner learning Portuguese in Portugal over a period of 22 weeks. Their findings question the assumption that language acquisition is a purely subconscious process (Krashen, 1982), since the learner clearly noticed some of the grammatical structures he seemed to have acquired. Different results were obtained in a similar study by Altman (1990, as cited in Schmidt, 1990), who monitored her own acquisition of Hebrew over a period of five years. Altman was unable to identify the source of half of the new verbs she had learned. She concluded that awareness was not necessary in learning vocabulary. Schmidt and Frota also admit that they were unable to trace much of what had been acquired to what had been noticed. Self reports are inherently subjective. Moreover, memory effects may play a role depending on the amount of time that passes before the diary entry is made. Nevertheless, first person accounts seem to be the most valid method for assessing what is noticed. Much of Schmidt's work ties

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findings from cognitive psychology into SLA theory. As N. Ellis (1994: 10) points out, "Schmidt is one of the few linguists who have adopted the conceptual and experimental rigours of experimental psychology in answering questions concerning the role of consciousness in L2 acquisition". Reviewing the psychological literature on consciousness has led Schmidt to propose the *Noticing Hypothesis*, which states that "noticing is the necessary and sufficient condition for converting input into intake" (1990: 129). Since then, a considerable amount of research has addressed the issue of noticing in SLA (Cross, 2002; Sakai, 2004; Chun & Zhao, 2006; Perry and Lewis, 2009).

One of the most influential attentional studies in SLA was conducted by Van Patten (1990), who investigated the notion of attention as a limited resource (Broadbent, 1958, as cited in Robinson, 1995). More specifically, the study examined whether learners were able to consciously attend to both form and meaning when processing input. Results showed that the *content only* and *lexical* groups significantly outperformed the *form* and *morphology* groups. This led Van Patten to conclude that it was difficult, especially for beginners, to notice content and form at the same time. Moreover, he postulated that learners would notice meaning before form, since their primary objective is to understand the prepositional content of utterances. Van Patten's findings have led SLA researchers to try and find ways to help learners focus on both form and meaning. Posner and Petersen (1990) describe attention in terms of three networks: *alertness, orientation,* and *detection.* Alertness refers to a general state of readiness to receive input. The higher the level of alertness, the faster the speed of selecting information for processing will be. Orientation to the alignment of attentional resources to a particular stimulus from among a host of stimuli. Orienting attention to a. stimulus facilitates th_9 processing of that stimulus. Orientation differs from alertness in that a learner might for example be ready to learn (alertness) but not know whether to focus on form or meaning (orientation). Detection is probably the most important network in attention; it refers to the cognitive registration of a stimulus. Once a stimulus is detected, it becomes available for further processing. Although detection does not necessarily imply awareness, Schmidt (2001) suggests using the term registration to refer to stimuli that are detected without awareness. According to Schmidt (1994: 179) noticing refers to the "registration [detection] of the occurrence of a stimulus event in conscious awareness and subsequent storage in long term memory..." Schmidt is careful to distinguish noticing from *understanding,* which he defines as "recognition of a general principle, rule or pattern" (1995: 29). Understanding represents a deeper level of awareness than noticing which is limited to "elements of the surface structure of utterances in the input" rather than underlying rules (Schmidt, 2001: 5). Tomlin and Villa (1994) suggest that there are four conceptions of attention in SLA. One is that of attention as a limited capacity system. The idea being that the brain may be presented (through the sensory system) with an overwhelming number of stimuli at any given time, and it seems impossible to process them all. The limitations of attention refer not only to the amount (or duration) of attention that may be given to a single stimulus but also to the number of stimuli that may be attended to simultaneously. This leads to a

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second conception of attention, namely that it constitutes a process of selection. The overwhelming amounts of incoming stimuli force the attentional system to be selective. The third conception of attention, involves controlled rather than automatic processing of information. The underlying assumption here is that some tasks require more processing effort, and hence a higher degree of attention, than others. A person may therefore perform two tasks at the same time, especially if one requires automatic processing (low attention). By the same token, it is more difficult to perform two tasks if both require controlled processing (high attention). The fact that controlled processing of two simultaneous tasks *is* sometimes possible led researchers to develop a fourth conception of attention, which is that it must involve a process of coordination among competing stimuli and responses. In this process, attention must be established, maintained, discontinued, and redirected in order to perform different actions (See Robinson, Ellis, N., 2011; Kimberly, 2009).

Transfer of Training

Within the last half-dozen years or so, cognitive psychologists have steadily become more and more interested in transfer, to the point where it is once again a principal focus of research. Transfer of training (often called transfer of learning) is pervasive in everyday life, in the developing child and in the adult. Transfer takes place whenever our existing knowledge, abilities, and skills affect the learning or performance of new tasks. In this connection, Cormier and Hagman (1987: XI) point out that "it is no wonder that the topic of transfer of learning has been of theoretical importance to the behavioral scientist and of practical importance to the educator and trainer". At the most general level, transfer is a phenomenon involving change in the performance of a task as a result of the prior performance of a different task (Gick and Holyoak, 1987). In essence, transfer of learning occurs whenever prior-learned knowledge and skills affect the way in which new knowledge and skills are learned and performed. When later acquisition or performance is impeded, transfer is negative (See Nation, 2008; Mouhanna, M. & Mouhanna, L., 2010).

Human performance in almost any cognitive or motor skill shows profound changes with practice. For example, the beginning reader may need a few second to encode each new letter and be error prone, whereas the expert can accurately encode 25 letters per second and still have sufficient capacity available to encode the material semantically. The striking changes that occur with practice have led many researchers to propose that qualitative changes occur in the processing (Schneider, Dumais and Shiffrin, 1984). According to Fisk, Schneider (1981), training can help to increase vigilance, but in tasks requiring sustained vigilance, fatigue hinders performance, so there may be no substitute for frequent rest periods to enhance signal detection. After a great deal of consistent practice, subjects in a number of studies have been able to perform complex dual tasks with little or no duel-process performance decrement (See Mongubhai, 2006; Lightbown & Spada, 2006).

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Because transfer depends on the application of previously acquired knowledge, it is inherently dependent on memory. There are four classes of factors that determine transfer performance, adapted from the four-factor model of memory performance developed by Jenkins (1979). First, it is important to consider the structure of the task to be initially learned and its relationship to the transfer task. That is, the learner's representation of the task is necessarily dependent on the structure of the task itself. Second, it is necessary to assess whether the conditions at encoding foster learning of the material and are appropriate for the subsequent transfer task. The third class of factors concerns conditions at retrieval (i.e, the performance of the transfer task) that influence access to and applications of appropriate knowledge. The fourth important factor to be considered is the background knowledge of the subjects. Effective transfer of knowledge depends on its prior acquisition. As long as structurally similar responses are acquired in the training and transfer tasks, positive transfer increases with degree of initial learning. Despite the importance of this basic fact, studies of transfer have not always demonstrated the requisite degree of initial learning.

The Present Study

The present study reports the results of an experiment, which was conducted on 200 learners of English as a foreign language. It attempts to answer three interrelated questions: 1) to what extent does the advanced students' performance in listening tasks differ from that of the beginning students before and after training?; 2) how can two types of training (intensive listening vs. improving learners' linguistic skills) affect L_2 learners' comprehension skill?, and 3) what does students' performance, before and after the training, tell us about their abilities to transfer?

The reader is reminded that listening comprehension is characterized as a highly-complex problem-solving activity that can be broken down into a set of distinct subskills. Two of these skills were described by Rivers (1972) as the recognition of component parts of the language (words, verb groups, simple phrases) and memory for these elements, once they have been recognized. Recognizing linguistic elements, while essential to the process, is not sufficient for comprehending what is heard.

Results

The first question that this study attempts to answer is "to what extent does the advanced students' performance in listening comprehension skill differ from that of the beginning students before and after training?". Based on the results of the experiment reported in the present study, the following conclusions can be made:

1) Sub-group (1) of the beginning subjects (N=50) scored a total of 408 out of 1500 points in the pre-test, with a means of 8.16, and standard deviation of 3.18. After receiving visual training, they scored a total of 728 points in the post-test, with a means of 14.56, and standard deviation of 4.74.

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2) Sub-group (2) of the beginning subjects (N=50) scored a total of 387 out of 1500 points in the pre-test, with a means of 7.74, and standard deviation of 3.20. After receiving auditory training, they scored a total of 526, with a means of 10.52, and standard deviation of 4.51.
3) Sub-group (1) of the advanced subjects (N=50) scored a total of 411 points out of 1500 in the pre-test, with a means of 8.22, and standard deviation of 3.44. After receiving visual training, they scored a total of 659 in the post-test, with a means of 13.18, and standard deviation of 4.59.
4) Sub-group (2) of the advanced subjects scored a total of 481 points out of 1500 in the pre-test, with a means of 9.62 and standard deviation of 3.72. After receiving auditory training, they scored a total of 695 points in the post-test, with a means of 13.90, and standard deviation of 5.82 (see Table 1).

Table (1)

Means and standard deviations of subjects' scores in the pre- and post- tests.

Note: Beginners and Advanced (1): Visual training group.

Beginners and Advanced (2): Auditory training group.

No.	Group	N	X	X^2	$\bar{X}$	SD
1	Beginners (1) Pre-Test	50	408	3836	8.16	3.18
2	Beginners (1) Post-Test	50	728	11724	14.56	4.74
3	Beginners (2) Pre-Test	50	387	3507	7.74	3.20
4	Beginners (2) Post-Test	50	526	6552	10.52	4.51
5	Advanced (1) Pre-Test	50	411	3971	8.22	3.44
6	Advanced (1) Post-Test	50	659	9741	13.18	4.59
7	Advanced (2) Pre-Test	50	481	5321	9.62	3.72
8	Advanced (2) Post-Test	50	695	11351	13.90	5.82

5) Both sub-groups of the beginning subjects (N=100) scored a total of 795 points out of 3000 in the pre-test, with a means of 7.95, and standard deviation of 3.20. After receiving two types of training (visual and auditory), they scored a total of 1254 points, with a means of 12.54, and standard deviation of 5.05.
6) Both sub-groups of the advanced subjects (N=100) scored a total of 892 points out of 3000 in the pre-test, with a means of 8.92 and standard deviation of 3.65. After receiving both

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types of training (visual and auditory), they scored a total of 1354 points in the post-test, with a means of 13.54, and standard deviation of 5.25 (see Table 2).

Table (2)

Means and standard deviations of both beginners and advanced in the pre- and post- tests.

No.	Group	N	X	X2	$\bar{X}$	SD
1	Beginners (1+2) Pre-Test	100	795	7343	7.95	3.20
2	Beginners (1+2) Post-Test	100	1254	18276	12.54	5.05
3	Advanced (1+2) Pre-Test	100	892	9292	8.92	3.65
4	Advanced (1+2) Post-Test	100	1354	21092	13.54	5.25

7) Comparing the performance of sub-group (1) of the beginning subjects in the pre-test to the performance of sub-group (2) of the beginning subjects in the pre-test shows that there is no significant statistical difference between the two. The T value is 0.65 which is not statistically significant.
8) Comparing the performance of sub-group (1) of the beginning subjects in the pre-test to their performance in the post-test was in favour of the post-test. The T value is 7.85, which is statistically significant at 0.01. Also, comparing the performance of sub-group (2) of the beginning subjects in the pre-test to their performance in the post-test (auditory training) shows that the training effect is statistically significant. The T value is 3.52, which is statistically significant at 0.01.
9) Comparing the performance of all Beginners (N=100) in the pre-test to that of all Advanced (N=100) in the pre-test was in favour of the Advanced subjects. The T value is 1.99, which is statistically significant at 0.05.

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Table (3)

T-Test

Variables	N	$\bar{X}$	SD	T	Sign. Level	In favour of
Beginners (1) Pre-Test	50	8.16	3.18	0.65	Insign.	-
Beginners (2) Post-Test	50	7.74	3.20			
Advanced (1) Pre-Test	50	8.22	3.44	1.93	Insign.	-
Advanced (2) Post-Test	50	9.62	3.72			
Beginners (1) Pre-Test	50	8.16	3.18	0.09	Insign.	-
Advanced (1) Pre-Test	50	8.22	3.44			
Beginners (2) Pre-Test	50	7.74	3.20	2.68	0.01	Advanced (2) Pre-Test
Advanced (2) Pre-Test	50	9.62	3.72			
Beginners (1+2) Pre-Test	100	7.95	3.20	1.99	0.05	Advanced (1+2) Pre-Test
Advanced (1+2) Pre-Test	100	8.92	3.65			
Beginners (1) Pre-Test	50	8.16	3.18	7.85	0.01	Beginners (1) Post-Test
Beginners (1) Post-Test	50	14.56	4.74			
Beginners (2) Pre-Test	50	7.74	3.20	3.52	0.01	Beginners (2) Post-Test
Beginners (2) Pre-Test	50	10.52	4.51			

$N_1 = N_2 = 100$

T = 2.60 significant at 0.01

= 1.97 significant at 0.05

10) Comparing the performance of sub-group (1) of the Beginning subjects in the pre-test to that of sub-group (1) of the Advanced subjects in the pre-test shows no significant statistical difference between the two. The T value is 0.09, which is not statistically significant. In addition, comparing the performance of sub-group (2) of the Beginning subjects in the pre-test to the performance of sub-group (2) of the Advanced subjects in the pre-test shows statistical significant difference between them in favour of the Advanced sub-group. The T value is 2.68 which is statistically significant at 0.01.

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11) Comparing the performance of sub-group (1) of the Advanced subjects in the pre-test to that of sub-group (2) of the Advanced subjects in the pre-test shows no significant statistical difference between the two. The T value is 1.93 which is not significant statistically (see Table 3).
12) Table (4) shows that comparing the performance of the beginning subjects (N=100) in the pre-test to their performance in the post-test was in favor of the post-test. The T value is 7.64, which is statistically significant at 0.01. Similarity, comparing the performance of the advanced subjects (N=100) in the pre-test to their performance in the post-test was in favour of the post-test. The T value is 7.19, which is statistically significant at 0.01.
13) Comparing the performance of sub-group 1) of the advanced subjects (N=50) in the pre-test to their performance in the post-test was in favour of the post-test. The T value is 6.05, which is statistically significant at 0.01. The same can be said regarding sub-group 2) of the advanced subjects. The T value is 4.34, which is statistically significant at 0.01.
14) More importantly, comparing the performance of sub-group (1) of the beginning subjects in the post-test (after receiving visual training) to the performance of sub-group (2) of the beginning subjects in the post-test (after receiving auditory training) was in favour of the visual training. the T value is 4.32 which is statistically significant at 0.01 However, this is not the case with the advanced subjects. That is, comparing the performance of sub-group (1) of the advanced subjects in the post-test (after receiving visual training) to the performance of sub-group (2) of the advanced subjects in the post-test (after receiving auditory training) shows that the effect of either training has no significant statistical value. The T value is 0.68 which is not statistically significant (see Table 4).

Table (4)

T-Test

Variables	N	$\bar{X}$	SD	T	Sign. Level	In favour of
Beginners (1+2) Pre-Test	100	7.95	3.20	7.64	0.01	Beginners (1+2) Post-Test
Beginners (1+2) Post-Test	100	12.54	5.05			
Advanced (1+2) Pre-Test	100	8.92	3.65	7.19	0.01	Advanced (1+2) Post-Test
Advanced (1+2) Post-Test	100	13.54	5.25			
Advanced (1) Pre-Test	50	8.22	3.44	6.05	0.01	Advanced (1) Post-Test
Advanced (1) Post-Test	50	13.18	4.59			
Advanced (2) Pre-Test	50	9.62	3.72	4.34	0.01	Advanced (2) Post-Test
Advanced (2) Post-Test	50	13.90	5.82			

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Beginners (1) Post-Test Beginners (2) Post-Test	50 50	14.56 10.52	4.74 4.51	4.32	0.01	Beginners (1) Post-Test
Advanced (1) Post-Test Advanced (2) Post-Test	50 50	13.18	4.59	0.68	Insign.	-
Beginners (1+2) Post-Test Advanced (1+2) Post-Test	100 100	12.54 13.54	5.05 5.25	1.37	Insign.	-

$N_1 = N_2 = 50$; T = 2.63 significant at 0.01

= 1.98 significant at 0.05

The second question that the present study seeks to answer is "how can two types of training (intensive listening vs. improving learners' linguistic skills) affect L_2 learners' listening comprehension skill?". Based on the results obtained, the following conclusions can be made:

1. The beginning subjects (N=100) scored a total of 795 points out of 3000 in the pre-test, with a means of 7.95, and standard deviation of 3.20. After receiving the two types of training (visual and auditory), they scored a total of 1254 points, with a means of 12.54, and standard deviation of 5.05.
   Similarly, the advanced subjects (N=100) scored a total of 892 points out of 3000 in the pre-test, with a means of 8.92 and standard deviation of 3.65. After receiving both types of training (visual and auditory), they scored a total of 1354 points in the post test, with a means of 13.54, and standard deviation of 5.25.
2. Comparing the performance of sub-group (1) of the beginning subjects in the post-test (after receiving visual training) to the performance of sub-group (2) of the beginning subjects in the post test (after receiving auditory training) was in favour of the visual training. The T value is 4.32 which is statistically significant at 0.01. However, this is not the case with the advanced subjects. That is, comparing the performance of sub-group (1) of the advanced subjects in the post-test (after receiving visual training) to the performance of sub-group (2) of the advanced subjects in the post-test (after receiving auditory training) shows that the effect of either training has no significant statistical value. The T value is 0.68 which is not statistically significant. Tables (5) and (6), and Figure (6) below, may clarify this point.

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Table (5)

Beginners (N=100)

Total	Test Type				
	Post-Test	Pre-Test			
100	50	50	N	Beginners (1) Visual	Type of Training
1136	728	408	X		
15560	11724	3836	X^2		
100	50	50	N	Beginners (2) Auditory	
913	526	387	X		
10059	6552	3507	X2		
200	100	100	N	Total	
2049	1254	795	X		
25619	18276	7343	X^2		

Table (6)

Analysis of Variance (2x2) between the type of Training (visual vs. Auditory) and Test-Type (Pre- and Post-Tests) For Beginners

Source of Variance	Squares	Degree of freedom	Variance	F	Sign.
Total Score	4627	199			
Between Groups	1465.86	3			
Within Groups	3161.14	196	16.13		
Type of Training	248.65	1	248.65	15.42	0.01
Test Type	1053.41	1	1053.41	65.31	0.01
Interaction	163.80	1	163.80	10.16	0.01

F = 6.76 significant at 0.01

= 3.89 significant at 0.05

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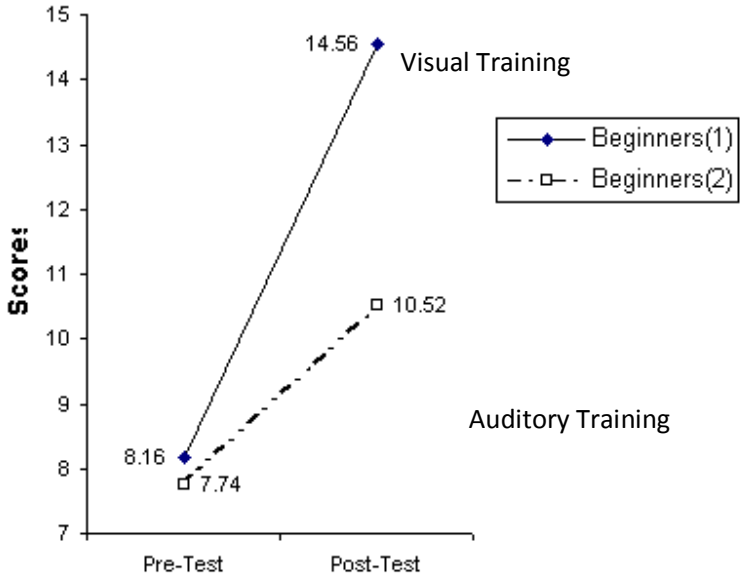
3. Tables (5) and (6), and Figure (1) show that the training that the beginning subjects received affected positively their performance in the post-tests. Table (6) shows that there is significant relationship between the training that beginning subjects received and their performance in the post-test. The F values that signify this result are 15.42 and 65.31, respectively. There is also a statistically significant effect of interaction of the training offered and the test type. The F value that signifies this result is 10.16. All F values are statistically significant at 0.01.

Figure (1)



Moreover, Figure (1) clearly shows that the visual training is more effective than auditory training for the beginning subjects. Due to the visual training, sub-group (1) of the beginning subjects scored higher in the post-test (the means for their scores were 8.16 in the pre-test, and 14.56 in the post-test). Although the auditory training resulted in improving the performance of sub-group (2) of the beginning subjects in the post-test, its effect is not the same as that of the visual training.

Tables (7) and (8), and Figure (2) clarify the situation with the advanced subject.

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Table (7)

Advanced (1+2)

Total	Test Type				
	Post-Test	Pre-Test			
100	50	50	N	Advanced (1) Visual	Type of Training
1070	659	411	X		
13712	9741	3971	X^2		
100	50	50	N	Advanced (2) Auditory	
1176	695	481	X		
16672	11351	5321	X^2		
200	100	100	N	Total	
2246	1354	892	X		
30384	21092	9292	X^2		

Table (8)

Analysis of variance (2x2) between the type of training (Visual vs. Auditory) and test-type (pre- and post-tests) for advanced subjects

Source of Variance	Squares	Degree of freedom	Variance	F	Sign.
Total Score	5161.42	199			
Between Groups	1129.18	3			
Within Groups	4032.24	196	20.57		
Type of Training	56.18	1	56.18	2.73	Insign.
Test Type	1067.22	1	1067.22	51.88	0.01
Interaction	5.78	1	5.78	0.28	Insign.

F = 6.76 significant at 0.01

= 3.89 significant at 0.05

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4. Tables (7) and (8), and Figure (2) show the extent to which the training that was given to the Advanced subjects affected their performance in the post test. Table (8) shows that neither the visual nor the auditory training significantly affected the advanced subjects' performance in the post test. The F values that signify this result are 2.73 and 0.28, respectively. Table (8) also shows that the Advanced subjects' performance in the post test was somewhat better than it was in the pre-test. The F value that signifies this result was 51.88, which is statistically significant at 0.01. This second result may appear to contradict the first result; but it is not. This can be illustrated in Figure (2).

Figure (2) clearly shows the increase in the Advanced subjects' performance in the post-test, which implies that the training had some effect. This effect, however, is not statistically significant. The means for sub-group (1) of the advanced subjects were 8.22 in the pre-test, and 13.18 in the post-test (after visual training). Similarly, the means for sub-group (2) of the advanced subjects were 9.62 in the pre-test, and 13.90 in the post-test (after auditory training). This will be, further, clarified more in tables (9) and (10) and Figure (3) next.

Figure (2)

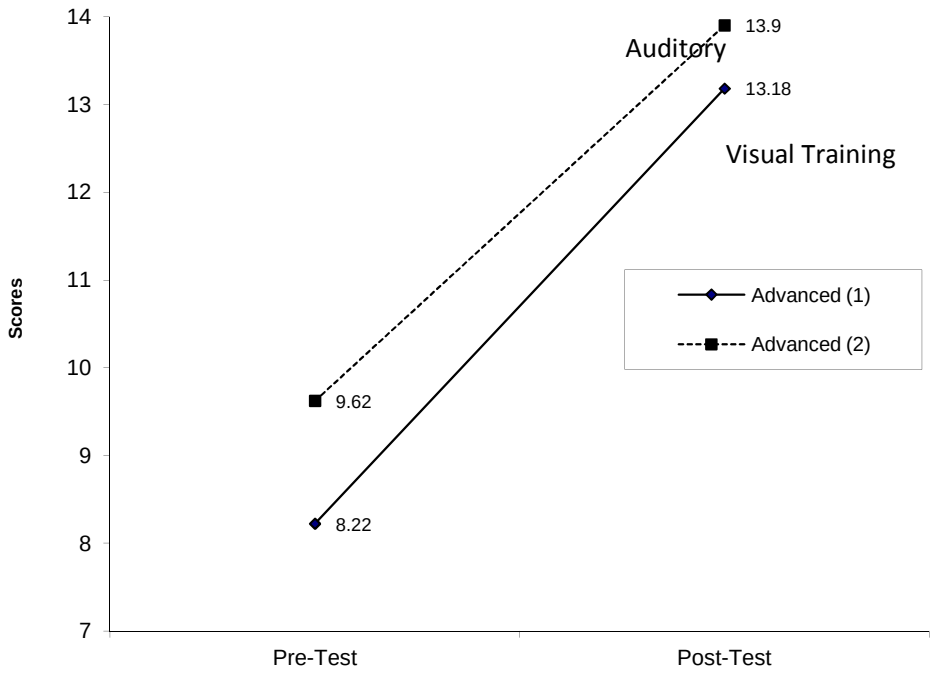

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Table (9)

Total	Students' Academic status				
	Advanced	Beginners			
100	50	50	N	Visual	Type of Training
1387	659	728	X		
21465	9741	11724	X2		
100	50	50	N	Auditory	
1221	695	526	X		
17903	11351	6552	X2		
200	100	100	N	Total	
2608	1354	1254	X		
39368	21092	18276	X2		

Table (10)

Analysis of variance (2x2) between students' academic status (beginners vs. advanced) and type of training: the post-test

Source of Variance	Squares	Degree of freedom	Variance	F	Sign.
Total Score	5359.68	199			
Between Groups	471	3			
Within Groups	4888.68	196	24.94		
Type of Training	137.78	1	137.78	5.52	0.05
Academic Status	50	1	50	2.01	Insign.
Interaction	283.22	1	283.22	11.36	0.01

F = 6.76 significant at 0.01

= 3.89 significant at 0.05

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5. Tables (9) and (10), and Figure (4) shows that the subjects of the study did benefit from the training they received, regardless of their academic status. That is, both beginners' and advanced' scores had been improved due to the training they received. The F values that signify this result are 5.52 and 11.36. Being beginner or advanced didn't affect their benefit of the training sessions. The question, however, is that what type of training was more effective?, and with what type of students? Figure (4) may answer these two questions. According to this Figure, the following results can be summarized in the following table:

Figure (3)

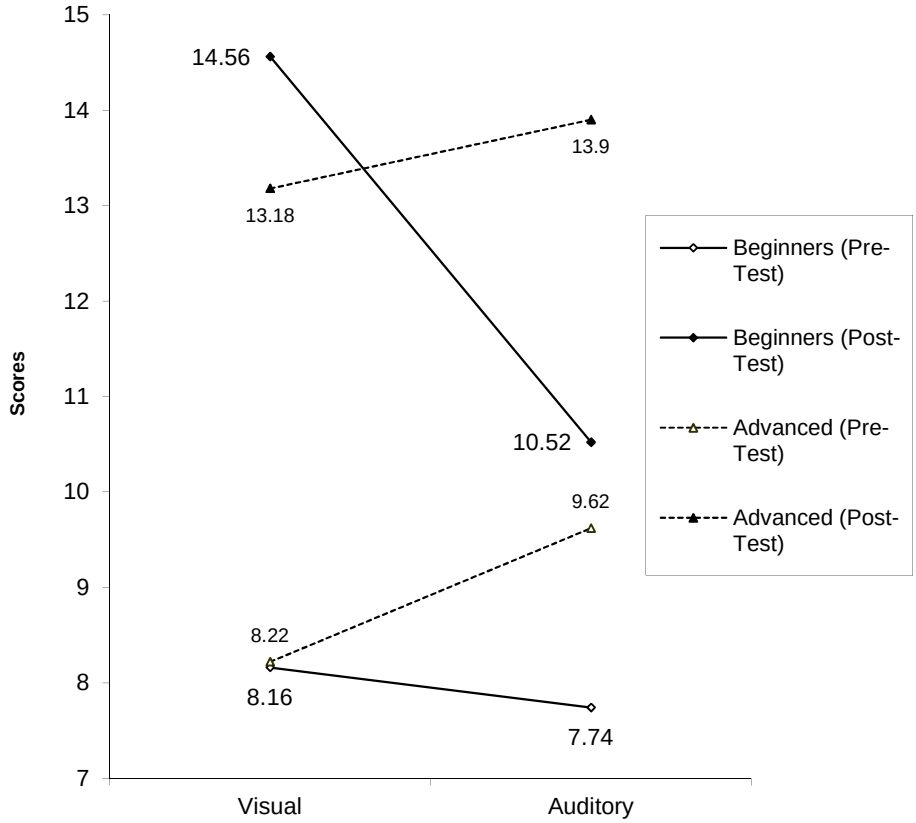

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Table (11)

	Beginners (N=100)	Advanced (N=100)
	Visual Training Sub-group (N=50)	Visual Training Sub-group (N=50)
Pre-Test	8.16	8.22
Post-Test	14.56	13.18
	Auditory Training Sub-group (N=50)	Auditory Training Sub-group (N=50)
Pre-Test	7.74	9.62
Post-Test	10.52	13.90

The means of the subjects' scores, which are presented in Table (11) above, will be more clearer in the following Figures.

Figure (4)

Visual Training

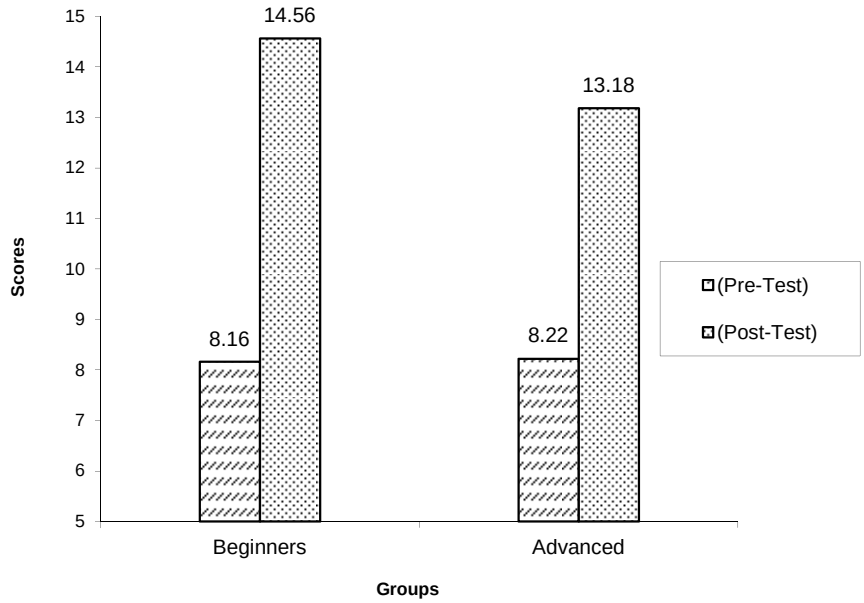

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Figure (5)

Auditory Training

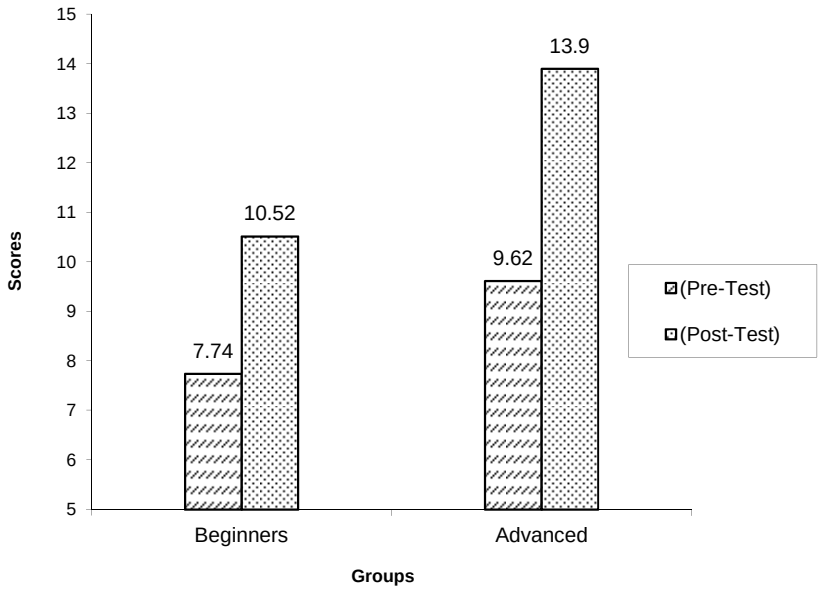
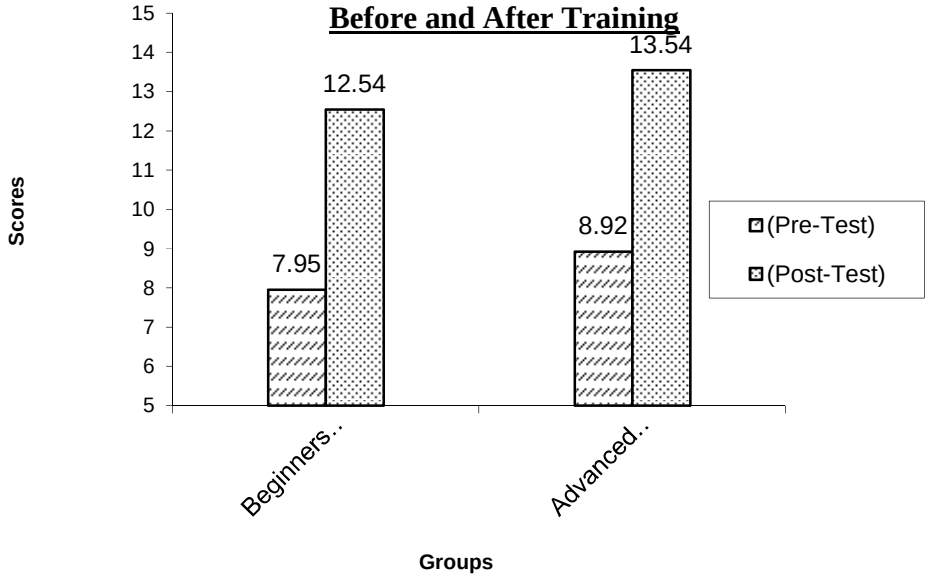


Figure (6)

Beginners vs. Advanced

Before and After Training



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Concluding Remarks

In the light of the previous results, some remarks can be made:

1) Increased practice may lead to improved performance. And, skilled performance is due in large part to a decrease in the total amount of attentional capacity that must be devoted to a task and to an increase in the efficiency of responding through the removal of unnecessary elements.
2) The results of the present study advocate practicing consistent single-task components first, prior to having the learner perform the tasks concurrently. That is, in single-task training, components become automatic, no longer requiring attention.
3) This study provides evidence suggesting that even after substantial single-task practice, additional practice was needed to stabilize performance when a multidimensional task such as listening comprehension had to be performed concurrently. As previously mentioned, listening comprehension is characterized as a highly problem-solving activity that can be broken down into a set of distinct subskills. Two of these skills were described by Rivers (1972) as the recognition of component parts of the language (words, verb groups, simple phrases) and a memory for these elements, once they have been recognized. Recognizing linguistic elements, while essential to the process, is not sufficient for comprehending what is heard.
4) For any training program to be effective, the trainee must have some level of proficiency on the individual tasks on one hand, and the whole task on the other hand. In this regard, it can be suggested that adaptive training can be idealistic solution. In adaptive training the task is first simplified and is then made progressively more difficult as the learner acquires greater levels of expertise. Typically the learner is exposed to the whole task or almost the whole task to be mastered. In this way, each component is practiced in the context of the whole task.
5) Comparing the performance of the advanced students to that of the beginning subjects in the Pre- and Post- tests may suggest that learners' motivation and attitudes toward the skill they are to master are crucial factors in their success or failure in mastering such a skill.
6) Based on the subjects' interpretations of their performance in the Pre- and Post-tests, it can be said the skill of listening should be given due attention. Almost all of them (Beginners and Advanced) complained that they had no sufficient training, and they were not satisfied with the quality and the quantity of the care currently given to the listening comprehension skill compared to other skills. Such a compliant should be taken seriously if we really value the role played by the listening comprehension skill in language acquisition.

Based on the subjects' explanations during the interview, one can argue that listening comprehension skill is a multidimensional activity which requires L2 learners to do more than one thing simultaneously. The problem here is that the demands on short-term memory exceed

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human being's cognitive capacity. The argument is compatible with the principles of the attention theory. This means that the subjects' incorrect responses can he explained within the principles of attention theory. That is, some L2 learners may appear to have the necessary knowledge for successful listening; however, they are unable to display this knowledge during listening. In this regard, Foder, Bever, and Garrett (1974) suggest that native language words are held in short-term memory only long enough for the listener to organize them into clauses and to extract the meaning that they convey. As soon as the listener has interpreted the clause, the elements that made it up are purged from memory in order to make room for incoming sounds. As Call (1985) points out, foreign language input seems to be processed in the same way, but, as Rivers (1981) points out, short-term memory for target language words is often overloaded, causing words to be purged before they can be organized and interpreted. Thus, even though language learners may be able to recognize each word of n utterance in mind long enough to interpret them. The capacity of short-term memory is limited to about even units, plus or minus two (Miller 1956).

This study showed that the subjects relied on many strategies in reaching correct answer: (1) focusing on certain key words; (2) relying on syntactic and semantic representations; (3) setting the overall meaning even when some words are missed (4) reading the four choices in advance, and (5) complete and successful listening comprehension but, unfortunately, in only few cases. However, their success or failure is constrained by the depth and completeness of their knowledge as well as the nature of the task they are performing. Second language learners' strategies are, in essence, knowledge driven. Consequently, in thinking about their performance as an object of study, the essence of the underlying knowledge that accounts for their performance must be examined. The examination of the learners' underlying knowledge will, in turn, uncover the basis for the strategies they use in solving language problems. It must be kept in mind that when we talk about knowledge, we do not only talk about the presence versus absence of knowledge, but also the depth, completeness, and accuracy of such knowledge. And, because subjects' knowledge was not as complete as it should be, their strategies were not as successful as we all hope. And, since their knowledge was fragmentary, some subjects failed to provide rational justifications for their correct responses. Rather, they tended to rely on totally unrelated, even, strange reasons.

Pedagogical Implications

Change in the way we think about learning and what we know about the way learning occurs have important implications for those situations in which we want to facilitate changes in what people know and/or do. In education, for example, corresponding changes are occurring in the way we think about teaching. Since learning is an active process, the teacher's task necessary involves more than the mere dissemination of information. Rather., if students are to learn desired outcomes in a reasonably effective manner, then the teacher's fundamental task is

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to get students to engage in learning activities that are likely to result in their achieving their outcomes, taking into account factors such as prior knowledge, the context in which the material is presented, and the realization that students' interpretation and understanding of new information depend on the availability of appropriate schemata. Without taking away from the important role played by the teacher, it is helpful to remember that what the student does is actually more important in determining what is learned than what the teacher does.

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