Inner Speech as Mental Rehearsal: The Case of Advanced L2 Learners

María C. M. de Guerrero
Inter American University of Puerto Rico

This paper is a follow-up study on the issue of L2 inner speech as it manifests in mental rehearsal among advanced L2 learners. The purpose of the study was to find out to what extent advanced L2 learners experience inner speech as mental rehearsal and to identify some of the characteristics and functions of such inner speech. Results show that advanced L2 learners experience inner speech in the second language to a great extent and that the frequency of L2 inner speech increases with proficiency. Advanced L2 learners, however, report using less inner speech than lower level learners for certain aspects of rehearsal, such as planning texts, self- and other-evaluation, storage and retrieval, self-instruction, and language play. It is argued that inner speech in the L2 is a developmental phenomenon associated with spontaneous rehearsal in the early stages of L2 acquisition and with verbal thinking in the more advanced stages.

The problem of inner speech is central in Vygotsky's (1978, 1986) theory. As Vygotsky's and his followers' ideas have become globally recognized, inner speech has been acknowledged as a major phenomenon associated primarily with the L1. In the field of second language acquisition (SLA), however, inner speech continues to be practically uncharted territory.[1] At least two reasons can be cited to account for this lack of attention on the part of SLA researchers. First, it is possible that, for researchers working within the current prevailing SLA paradigm, Vygotsky's theories and the problems associated with them appear to be irrelevant and/or irreconcilable. A problem like inner speech, which suggests a view of mind as a predominantly sociocultural product, framed as it was within the dialectics of historical materialism in Vygotsky's writings,[2] does not seem to "fit the facts" (as Kuhn, 1970, p. 141, would put it) of SLA mainstream theory, which is ultimately concerned with the psychological mechanisms that underlie the acquisition of L2 properties as a process situated mainly in the learner's head.[3] Second, there is the problem of method. Because inner speech is covert language behavior, it is inaccessible to direct methods of observation. Vygotsky (1986) himself recognized that "the area of inner speech is one of the most difficult to investigate" (p. 226). His way of breaking the inaccessibility of inner speech was the "genetic method of experimentation" (p. 226). This method, which came to be known as "the Vygotsky method of studying inner speech" (Ushakova, 1994, p. 137), consisted of approaching inner speech through the observation and analysis of egocentric speech, in the assumption that egocentric speech is the vocalized transition between social external speech and inner covert speech. As SLA research becomes more open to nontraditional theoretical and methodological approaches, however, topics like

Issues in Applied Linguistics
ISSN 1050-4273
Vol. 10 No. 1, 27-55
© 1999, Regents of the University of California

inner speech, rooted in sociocultural theory, may start to yield fresh new insights into second language learning. In fact, the study of inner speech can help to reconceptualize many L2 learning processes and issues. Memory, learning strategies, input-output processing, and language development are just a few of the fundamental issues where an inner speech perspective may be enlightening. Through the analysis of past and present data, I will lay out in this paper a view of inner speech as a developmental phenomenon in the L2, starting out in its early stages as spontaneous mental rehearsal of the language and blossoming in its maturity into a flexible tool for verbal thought.

As Kozulin (1986) explains, the problem of inner speech is devoted full attention twice in Vygotsky's *Thought and Language*. First, Vygotsky introduces it in the context of his disagreement with Piaget over the role and fate of egocentric speech. While Piaget regarded the typical egocentric speech of preschool children as a mere symptom of their autism and egocentrism, before the emergence of socialized speech, and denied it any essential role in intellectual development, Vygotsky viewed egocentric speech as a transitional phase between early social speech and mature inner speech and assigned it a very important function: that of planning, organizing, and directing problem-solving activity. For Vygotsky, the fact that egocentric speech tends to disappear at about school age does not mean it atrophies, as Piaget believed; it becomes inner speech. As egocentric speech loses its vocal character, the child is able to "think words" without pronouncing them (p. 230). Once attained, inner speech enables the child to carry out intrapsychically those mental operations that were first carried out interpsychically in communicative discourse with others and vocally with oneself during egocentric speech. In this theory, inner logical reflection, for example, has its origins in the social discursive practices of argumentation. As Frawley (1997) puts it, "social dialogue condenses into a private dialogue for thinking" (p. 95).

The second major treatment of inner speech in Vygotsky's *Thought and Language* is centered on his analysis of the relationship between thought and speech. For Vygotsky (1986), thought and speech, two genetically independent strands of development in the human being, come to be fused – for historical/cultural rather than biological reasons – as verbal thought, one type of thinking that is mediated by inner speech. Because inner speech is speech for oneself, it is radically different from external speech. Syntactically abbreviated and devoid of sound, inner speech can best be appreciated in its peculiar semantics, characterized by three main features: preponderance of sense over meaning (context prevailing over the stable meaning of a word), agglutination (merging words together), and influx of sense (the senses of words influencing one another). The result is "a dynamic, shifting, unstable thing, fluttering between word and thought" (Vygotsky, 1986, p. 249). Ultimately, for Vygotsky, understanding inner speech as the link between thought and word was the key to comprehending a deeper problem: that of the origin and nature of human consciousness. In the development of word, as it transits from the external sphere of socially situated events to the internal realm of

psychic experience, Vygotsky found the "historical" development of consciousness (1986, pp. 210, 256).

Elucidating the nature and function of inner speech (in a monolingual context) was a major concern throughout Vygotsky's career. One of his strongest claims was that higher mental processes are mediated by signs, that is, tools of a psychological nature (Wertsch, 1985). Inner speech serves this instrumental function. Inner speech mediates thinking, and as such it is, as Frawley states (1997), language *for* thought (not language *of* thought), a "vehicle for thinking" (p. 182). Without inner speech, it would be impossible for the mind to engage in high order psychological processes such as concept formation, voluntary attention, and logical memory (Vygotsky, 1978, 1986). As an "instrument of individual thought" (Vygotsky, 1986, p. 236), inner speech serves mental orientation, conscious reflection, and problem solving. Inner speech not only organizes conscious thought and guides action but is also instrumental in planning future behavior. Vygotsky assigned a rehearsal role to inner speech when he acknowledged that inner speech "serves as preparation for external speech—for instance, in thinking over a lecture to be given" (1986, p. 88). He considered inner speech a "mental draft," for example, when we are going to write or say something (p. 243). Succinctly, Vygotsky saw inner speech as an ideational tool with strong social, communicative roots.

Both Sokolov (1972) and Luria (1982), two of Vygotsky's followers who took up the study of inner speech, stress the role of inner speech in communication, while recognizing the social character of its origin. Sokolov (1972), for example, identifies three main functions of inner speech: the function of *semantic generalization* or the formation of general semantic complexes, the function of *semantic memorization* or fixation in memory, and a *preparatory* function for communication, or the function of mentally planning future statements. He believes "inner speech represents a psychological transformation of external speech, its 'internal projection,' arising at first as a repetition (echo) of the speech being uttered and heard, but becoming later its increasingly abbreviated reproduction in the form of verbal designs, schemes, and semantic complexes" (1972, p. 1). Luria (1982), on his part, after tracing the development of inner speech as first external speech, then fragmented external speech, then whispered speech, and finally abbreviated speech for oneself, reverses the process as inner speech is transformed into fully expanded speech production. In fact, inner speech has been identified as a concomitant of all four modes of communication: speaking, listening, reading, and writing (Beggs & Howarth, 1985; Flower, 1984; Johnson, 1984).

As an L2 researcher, my particular interest in inner speech has always been from the point of view of inner speech as the mind-language mechanism that underlies mental rehearsal, an L2 learning strategy that involves the covert practice of the L2 (Chamot, 1987; O'Malley, Chamot, Stewner-Manzanares, Russo, & Küpper, 1985; Rubin, 1987; Tarone, 1983), which has also been associated with the phenomenon first identified by Krashen (1983) as "din in the head".[4] The connection between various forms of mental rehearsal and inner speech, both from

an L1 and an L2 perspective, was first made in the literature in a nonempirical way. In 1983, Smith equated rehearsal with the usual practice of "talking to oneself" and proposed that the linguistic nature of this type of inner speech be studied. In 1987, Rohrer argued that inner speech is "the language of the mind" (p. 92), used in various mental operations, one of which is rehearsal. In 1990, Murphey published an article reviewing the studies conducted on the "din in the head" (Bedford, 1985; Guerrero, 1987; Krashen, 1983; Parr & Krashen, 1986) and linking this phenomenon to Vygotsky's concept of inner speech: "What [Vygotsky] calls inner speech may have a strong connection to what is now being called the Din" (Murphey, 1990, p. 55). In a few words, then, the relationship between inner speech and mental rehearsal appears to be one in which inner speech is a broad language function covering a wide range of mental operations, among which is rehearsal, the covert practice of language that is common in L2 learning.

In order to empirically investigate inner speech in the L2, I conducted a study (Guerrero 1990/1991, 1994) on the nature of inner speech during mental rehearsal of the L2 as it occurred across three proficiency levels (low, intermediate, and high) of ESL college learners. One of my objectives was to gather evidence that would cast light on the question of whether mental rehearsal disappears or wanes with proficiency, a question on which there was somewhat contradictory evidence in the literature. I found that it increased with proficiency. Left out from the sample of that study was a group of still higher level learners, those who could be considered "advanced" ESL because of their near-native ability in English. By targeting this latter group of learners, my purpose in the present study is to find out to what extent very advanced L2 learners experience inner speech as mental rehearsal and to identify some of the characteristics and functions of such inner speech.

REVIEW OF STUDIES ON L2 INNER SPEECH AS MENTAL REHEARSAL

The problem of whether very advanced L2 learners experience inner speech as mental rehearsal has a somewhat conflicting trajectory in the literature. It may thus be useful to put this problem into a historical perspective. Mental rehearsal was first singled out as an SLA phenomenon by Krashen (1983), who, calling it "the din in the head," defined it as "an involuntary rehearsal of second language words, sounds, and phrases" (p. 41). This phenomenon had been reported by Barber (1980) as a personal foreign language (FL) experience she had had while traveling in Europe. Krashen (1983) hypothesized that "the Din is a result of stimulation of the Language Acquisition Device" (p. 43), that it is triggered by comprehensible input of the i + 1 variety, and that it will not occur in very advanced learners "since they will receive less input containing i + 1, having acquired most of the language" (p. 43).

Bedford (1985) was the first to test Krashen's Din Hypothesis empirically

(see Table 1 for a summary of empirical studies). On the basis of survey data provided by 160 L2 college and FL adult learners, Bedford was able to confirm that "spontaneous playback of the second language," as he called the Din, was a widespread phenomenon rather than a process restricted to a few individuals. Bedford found no difference by amount of previous study, thus being unable to support Krashen's prediction that the Din would disappear with more proficiency. Bedford clarified, however, that none of the subjects in his sample could be described as a "very advanced acquirer" (p. 283).

Table 1: Studies on L2 Inner Speech as Mental Rehearsal

Study	Description of phenomenon	Number and type of participants	Percentage of responses	Increase/Decrease with proficiency
Bedford (1985)	spontaneous playback of the L2 (Din or spontaneouse rehearsal)	160 L2 college and FL adults	68 *sometimes* to *always*	no difference by amount of previous study
Parr & Krashen (1968)	involuntary rehearsal of the L2 (a "din in the head" as described by Barber, 1980)	150 FL high school 216 FL college 28 L2 very advanced adults	78 Yes 69 Yes 10 Yes	signficant decrease
Guerrero (1987)	mental rehearsal of the L2 (Din)	52 ESL college (3 levels of proficiency)	79 *sometimes* to *always*	slight increase, but not significant
Doran (1989)	mental rehearsal of the L2 (Din)	278 ESL high school	92 *sometimes* to *always*	
Guerrero (1990/1991)	inner speech during mental rehearsal of the L2	426 ESL college (3 levels of proficiency)	84 *sometimes* to *always*	significant increase with proficiency
Lantolf (1997)	language play (private speech, subvocal rehearsal, inner speech)	86 FL college, elementary 28 FL college, advanced 42 ESL college, more advanced	51 *often & very often* 90 *often & very often* 83 *often & very often*	decrease with proficiency
McQuillan & Rodrigo (1995)	involuntary rehearsal of the L2 (Din) and a "reading din"	35 FL college	80 (Din) *sometimes* to *very frequently* 57 ("reading din") *sometimes* to *very frequently*	
Sevilla (1996)	involuntary rehearsal of the L2 (Din)	40 elementary school formerly LEP, now FEP	57.5 Yes 35 Yes 80 Yes	57.5% had experienced the Din; 100% no longer experienced the Din

Note: LEP = limited English proficient; FEP = fully English proficient

In 1987, I replicated Bedford's study with a sample of 52 ESL college students on three levels of proficiency (Guerrero, 1987). Again, I confirmed that the Din was a well-known phenomenon for the language learners, 79% admitting to having experienced it. Moreover, I found that there was no difference in frequency of Din activity among the three levels, and that, although statistically insignificant, there was a slight increase with proficiency. Thus, I concluded that mental rehearsal could occur at any moment during acquisition and that, contrary to Krashen's prediction, even very advanced learners mentally rehearse. Later, Doran (1989) replicated Bedford's and my study with a population of high school ESL students in Puerto Rico and found that 92% percent of them had experienced the Din in English at least *sometimes*.

In 1986, Parr and Krashen published the results of two studies testing Krashen's Din Hypothesis. The first study tested the prediction that the Din is a widespread phenomenon. The data obtained from 150 high school students of Spanish and 216 college students of Spanish confirmed the prediction: 78% of the high school students and 69% of the college students answered affirmatively the question "Have you experienced the 'Din in the Head'?" after reading Barber's (1980) description of the phenomenon. The second study, however, supported the claim that advanced performers do not experience involuntary rehearsal. In this study, the data came from a group of 28 "advanced graduate students and faculty in foreign language education who had acquired their second language as adults" (p. 276). Only 10% percent (3 subjects) of these speakers answered "Yes" to whether they had experienced the Din. There are a few problems with these data, however. Although the authors claim these were "advanced performers of the second language" (p. 276), the proficiency level of the participants in either study was not measured in any systematic way. Moreover, the "advanced performers" were interviewed orally rather than surveyed through a questionnaire, as was done in the first study. Krashen explained the discrepancy between these results and Bedford's (1985) and Guerrero's (1987) saying that maybe the subjects in his study "were even more advanced, professors and teachers of the language" (personal communication, March 14, 1988).

In1990 I conducted a study on mental rehearsal of the L2 as a manifestation of inner speech. In this empirical investigation (Guerrero 1990/1991, 1994), I not only set out to explore the nature—in terms of form and functions—of inner speech during mental rehearsal of the L2 but also examined whether there were any differences among students at three levels of ESL proficiency—low, intermediate, and high. Using questionnaire data from 426 ESL college students, I was able to confirm that 84% of the participants had experienced inner speech as described in the study (including those who answered *sometimes*, *often*, or *always*). The study confirmed several linguistic characteristics of L2 inner speech: It was sonorous in the mind, despite being inaudible to outsiders; it was abbreviated in structure, though it could become expanded during mental dialogue; it often contained lexical items the students wanted to imitate or remember; and it was usually meaningful, though

sometimes unfamiliar words had to be processed. Inner speech was found to serve eight functional roles: ideational (to clarify thought), mnemonic (to store and retrieve information in memory), textual (to create, organize, and experiment with the form of oral or written texts), instructional (to self-teach the language), evaluative (to self- or other-evaluate language use), affective (to derive self-satisfaction and acquire self-confidence), interpersonal (to imagine conversations with others), and intrapersonal (to talk to oneself).

As to the differences among the three proficiency samples, a statistically significant positive correlation between inner speech and proficiency was found; in other words, as the proficiency level increased, so did the frequency of inner speech in terms of percentage of Yes (*sometimes*, *often*, or *always*) responses: low level, 75%; intermediate level, 89%; high level, 90%. These three levels represented the various degrees of proficiency evidenced by the majority of the ESL population (native speakers of Spanish) attending Inter American University of Puerto Rico.[5] They had been selected on the basis of their incoming college entrance examination scores as determined by the ESLAT, a College Board ESL proficiency test which ranges from 200 to 800. Scores for the low level students were <400; intermediate level, 400-499; and high level, 500-599. Outside the sample, and not surveyed in my study, was a small group of very advanced ESL students who, because of their very high scores of 600-800 on the ESLAT, were grouped in regular English courses with an assorted and very small population of native speakers of English and English-Spanish bilinguals.

Recently, Lantolf (1997) reported the findings of a study on "language play" in the L2, a type of private speech which he associates with the Din phenomenon, subvocal rehearsal, and inner speech. Lantolf's language play phenomenon includes both the covert, silent variety of inner speech as well as the more overt, audible manifestations of private speech. Some examples of language play stated in his questionnaire description of the phenomenon are: "talking out loud to yourself in Spanish; repeating phrases to yourself silently; making up sentences or words in Spanish; imitating to yourself sounds in Spanish; [and] having random snatches of Spanish pop into your head" (1997, p. 11). The questionnaire used in the study, modeled on Bedford's (1985), asked students to identify whether they played with Spanish in a variety of situations. Participants were 156 college students, distributed as follows: 86 were enrolled in first and second year classes of Spanish as a foreign language (SFL), 28 were enrolled in third and fourth year SFL classes, and 42 were enrolled in advanced ESL classes. Although placement procedures and program requirements differed between the SFL and the ESL students, making proficiency comparisons difficult, Lantolf estimated that the ESL students' level of proficiency in English was higher than that of the SFL students in Spanish. Splitting his sample in three proficiency levels (SFL elementary, SFL advanced, and ESL), Lantolf was able to observe that frequency of language play decreased as the level of the L2 increased.

Lantolf (1997) argues that language play, as a private speech function, has

an important role in L2 learning. He associates L2 language play with Vygotsky's view of play in general. For Vygotsky, play creates a zone of proximal development where children can act at a level beyond their current level of development. Language play would have the same effect for L2 learners: It would allow them to push their language development forward as they mentally experiment with and operate on things they notice in both input and output. Basing himself on MacWhinney's (1985) dialectic competition model of language learning, Lantolf further speculates that "language play is the activity of regaining lost equilibrium" (p. 16). An L2 learner would lose equilibrium when confronted with, for example, an L2 form (antithesis) that does not match his/her own production (thesis) of the L2. To overcome this conflict, the learner will try to provide a synthesis and in this process will resort to language play, a mechanism which allows "comparison of the old system with the new evidence" (p. 17). Why do advanced learners play less with the L2? Lantolf says: "As learners become more advanced, the potential conflict between their system and the target language system decreases, thereby reducing the chances of the learner being thrown into a state of disequilibrium. Consequently, the need for advanced learners to engage in language play . . . is greatly diminished or eliminated altogether" (p. 17).

Two additional studies have been conducted on the Din. One is by McQuillan & Rodrigo (1995), who wanted to find out whether FL learners experience the Din after reading. Thirty-five college students of Spanish as a FL answered a revised version of Bedford's (1985) questionnaire. Eighty percent of the participants answered affirmatively (*sometimes* to *very frequently*) to whether they had experienced the Din in general and 57% to whether they had experienced it after reading. McQuillan & Rodrigo's conclusion is that both listening and reading are important sources of input for the Din to take place.[6] The other study, by Sevilla (1996), involves children. Sevilla selected 40 FEP (fully English proficient) elementary school learners who had been LEP (limited English proficient). Whereas 57.5% of these children reported having experienced the Din in the past, 100% of them said they no longer experienced it at the time they were interviewed. There were also differences between the children who were US born and foreign born. Only 35% of those who were US born reported having experienced it while 80% of the foreign born recognized the phenomenon as something they had had. Sevilla's findings suggest that as the children approached native-like competence they no longer experienced the Din.

THE PRESENT STUDY

A review of the pertinent studies has revealed that the case regarding advanced learners is still not closed. As Table 1 shows, there are some discrepant findings in terms of inner speech as rehearsal among the most advanced learners in the different studies. While in some studies (Bedford, 1985; Guerrero, 1987; Guerrero, 1990/1991, 1994) mental rehearsal of the L2 increases—or does not

disappear—with proficiency, in other studies (Parr & Krashen, 1986; Lantolf, 1997; Sevilla, 1996) it tends to decrease or disappear. It is also apparent that the various researchers, while tapping in a very general way a single phenomenon, have actually observed each in his or her own way slightly different manifestations of it. Furthermore, there is too much variation in the samples and the populations they represent, measurements of linguistic ability are nonexistent or not consistent throughout the studies, and comparisons among proficiency levels are therefore problematic. To overcome these shortcomings, I conducted a follow-up investigation, drawing evidence from that unsampled group of very advanced learners I had left aside in my earlier study (Guerrero, 1990/1991; 1994). This would provide a means of comparison with lower level groups while ensuring some internal consistency in the linguistic ability measurement, in the description of the phenomenon presented to the participants, and in the methodology used.

The research questions for the present study were:

(1) To what extent do advanced L2 learners experience inner speech as they mentally rehearse in the second language?

(2) How do advanced L2 learners compare with less proficient learners of the second language in certain aspects of their inner speech used for rehearsal?

METHOD

Instrument

The same questionnaire used in Guerrero (1990/1991) was selected as the data collection method in order to ensure consistency with the previous study. The questionnaire was subject to a few modifications (see new version of Questionnaire in the Appendix). The introduction, which explains the purpose of the questionnaire and defines inner speech and metal rehearsal, and Part I, which elicits biographical information from the participants, were left unchanged. In Part II, seven questions that were not pertinent to the purposes of the present study were deleted.[7] Twelve questions addressing some new aspects were added: One (#2) sought to confirm whether the participants still experienced inner speech. This was added immediately after question 1, which queried students as to the extent with which they had experienced inner speech. Four questions (#29-32) were introduced to find out if the participants "played" with their inner speech in a variety of ways. This was the aspect of inner speech that Lantolf (1997) had focused on in his study. Seven questions (#33-39) were added to investigate the affective role of inner speech. This function of inner speech had been reported by the participants in my earlier study (Guerrero, 1990/1991, 1994) during the interviews but had not been measured through a questionnaire. As a consequence of this adding and deleting, items in the original questionnaire were moved around so that the original 35-item questionnaire resulted in a slightly different 40-item instrument. The questionnaire was in two versions—English and Spanish—for the students to choose the one they felt most comfortable with at the moment of an-

swering. Students were asked to give their responses on a five-point Likert scale ranging from *never* to *always*.

As it stands, the present 40-item questionnaire is therefore aimed to discover (1) the extent to which advanced L2 learners experience inner speech as they mentally rehearse in the second language (items 1 and 2) and (2) how advanced L2 learners compare with less proficient ones in certain aspects of their inner speech, in particular, its structural complexity (items 3-6), phonology (items 7, 14, and 15), meaningfulness (item 13), extent to which learners look up unfamiliar words that come to their minds (item 16), extent to which inner speech is related (item 25) or unrelated (item 24) to the English class, extent to which the learners' inner speech in English is mixed with Spanish (item 40), and its various functions: *mnemonic* (items 8, 11, and 12), *instructional* (items 9, 10, and 22), *evaluative* (items 20, 21, 23, and 26), *textual* (items 17, 18, and 19), *interpersonal* (item 27), *intrapersonal* (item 28), *playful* (items 29-32), and *affective* (items 33-39).

The instrument used in the present study has undergone a long process of validation, which started with a broad elicitation instrument designed to draw learners' explicit responses about their experience with inner speech in English. The process, best described in Guerrero (1990/1991, pp. 47-51), included several attempts at refining the instrument with the aid of supporting literature, a pilot study, learners' feedback, and reading by experts. The present modifications of the questionnaire are an additional attempt to adjust the instrument to the purposes of this study. To assess the reliability of the questionnaire, the data were submitted to the Cronbach alpha test, a measure of internal consistency recommended by Oxford (1996) for language strategies questionnaires. The resulting Cronbach α coefficient of .90 ($n = 64$) was considered adequate.

The use of a questionnaire to self-assess a phenomenon as elusive as inner speech may be considered a limitation of this study. Self-report data constitute one way of gaining access into covert language behavior, but several drawbacks are involved, namely, potential problems related to memory (unreliability, inaccessibility, incompleteness) and veracity (how sincere the participants' answers were), as discussed in Cohen (1987) and Ericsson & Simon (1980). In order to minimize the effect of these factors, the questionnaire instructions stressed the need for the students to be as truthful and precise as possible. Still, as in all cases in which mentalistic data are used, the results of this study should be taken for what they represent: a collection of the participants' reported perception of their own mental processes.

Participants

The questionnaire was administered to 81 students enrolled in advanced English courses (ECSG 2311, 2312, and 2313) at Inter American University of Puerto Rico, Metropolitan Campus. Each of these courses is worth 3 credits, and students who are placed on the advanced level have to take these three courses to fulfill their 9 credit English requirement. To be placed on this advanced level,

students must have a score of above 600 on the ESLAT (an ESL version of the College Board's entrance examination which ranges from 200 to 800). Some students who are considered native speakers of English are also placed on this level. Most students on this level are fully bilingual, though few could be considered native bilinguals (NB; raised and equally fluent in two languages). The teaching of English in these courses does not have an ESL approach: Throughout the series, students develop writing skills in different genres, do research projects, and read literature, much as they would in regular college English courses in the U.S. The population in these courses is not only highly competent in the written skills but also very fluent orally. Classes are conducted entirely in English. Students usually take these courses in a sequence.

Of the 81 collected responses, 13 were not counted as data because they were incomplete or because the students' ESLAT scores could not be verified or were lower than 600. Within the remaining sample, there were 46 L2 students (those who answered "Spanish" to the question "Which do you consider to be your first language?"), 18 L1 students (those who answered "English" to the same question), and 4 NB students (those who answered both "English" and "Spanish"). There were 36 females and 32 males in the sample.[8] The students' age mean was: L2 students, 21; L1 students, 24; and NB students, 27. The College Board ESLAT mean was 643 for the L2 students, 662 for the L1 students, and 690 for the NB students. The analysis of responses will focus mainly on the L2 students (n = 46), which were the targeted group for this research.

Data Collection Procedures

Questionnaires were distributed among the available sections of advanced English courses. Students were given the option of answering the questionnaire in English or Spanish, as they preferred. The names of the students who had taken the questionnaire were then sent to the Admissions Office so that their ESLAT scores could be verified.

Data Analysis

Responses to the questionnaire were entered in the computer and analyzed using the SPSS program. For computing purposes, responses on the Likert scale were given numerical values: never = 0, almost never = 1, sometimes = 2, often = 3, always = 4. Descriptive and inferential statistics were applied. The descriptive statistics consisted of frequencies, percentages, modes, and medians. The inferential statistics included the one-sample chi-square test applied to each item of the questionnaire, the multiple-sample chi-square test to find differences among the subgroups, and the McNemar test for related samples to ascertain the difference in responses between item 1 and item 2 within the L2 group. In order to simplify the data and because there were too few students to fill cells with a >5 frequency as is required for chi-square tests, the five categories on the Likert scale were collapsed into two: No (*never* and *almost never*) and Yes (*sometimes*, *often*, *always*). This

procedure had been used before by Bedford (1985), Guerrero (1987), Guerrero (1990/1991, 1994), and Lantolf (1997). The alpha level of statistical significance for all tests was set at <.05.

The figures obtained for the present sample were compared with those of my previous study (Guerrero 1990/1991, 1994) employing three lower levels of ESL proficiency and with some of Lantolf's (1997) reported figures. Some comparisons were also made between the L2 group (n = 46) and the L1 group (n = 18) within the present sample. Unfortunately, the NB group (n = 4) was too small to warrant any comparison.

RESULTS AND DISCUSSION

Research Question 1: To what extent do advanced L2 learners experience inner speech as they mentally rehearse in the second language?

Item 1 of the questionnaire (Have you had inner speech in English?) was answered affirmatively (*sometimes* to *always*) by 98% of the students in the L2 group. The difference between No and Yes answers was statistically significant [χ^2 (1, N = 46) = 22.260, p<.000]. These figures are higher than those obtained for lower proficiency students (all L2 learners) in the previous study (Guerrero, 1990/1991, 1994), so it would seem that inner speech used for mental rehearsal increases with proficiency in the language (see Table 2). For the L1 learners (n = 18), inner speech was also very frequent; actually their percentage of Yes responses was distributed as follows: 17% *sometimes*, 22% *often*, and 56% *always*. In contrast, for the L2 students (n = 46), the distribution was 52% *sometimes*, 24% *often*, and 22% *always*. Whereas the L2 group had a median of 2 (*sometimes*) for Yes

Table 2: Frequency of Inner Speech as Mental Rehearsal across Proficiency Levels

	Guerrero (1990/1991, 1994)			Present sample
	Low ESL n = 161	Intermediate ESL n = 192	High ESL n = 73	Advanced ESL n = 46
ESLAT scores	<--399	400-499	500-599	600-->
Item 1: Have you had inner speech in English?				
	75	89	90	98
Item 2: Do you still experience inner speech in English?				
	-	-	-	91

Note: ESLAT = English as a Second Language Achievement Test

responses, the L1 group had a median of 4 (*always*). The L1 students thus seemed to experience inner speech with greater frequency than the L2 students; this difference, however, was statistically nonsignificant.[9] This would confirm that inner speech as it occurs during mental rehearsal is a very widespread phenomenon, not only among advanced L2 learners but also among native English students.

Item 2 (Do you still experience inner speech in English?) had a smaller percentage of Yes responses than Item 1 (see Table 2), but the difference, as ascertained by the McNemar test, was nonsignificant. These figures cannot be compared with those of lower level groups because this was a new question introduced in this questionnaire. What these results indicate is that still at the present moment of taking the questionnaire the students' frequency of inner speech was very high, although not as high as the total frequency of inner speech experienced up to the present. This question was introduced to ascertain that the students were not merely reporting the frequency of a past experience (as item 1 could be interpreted). Responses to item 2 confirm that inner speech was still a very present and very frequent phenomenon for the students.

If only these two questions were taken as evidence of increase or decrease of inner speech as mental rehearsal across proficiency levels, there would be basis for rejecting the hypothesis that mental rehearsal of the L2 disappears with proficiency. But further analysis of the data is necessary before any conclusive statement can be made. It is thus necessary to focus on specific groups of questions in order to have a more accurate picture of what the data show.

Research Question 2: How do advanced L2 learners compare with less proficient learners of the second language in certain aspects of their inner speech used for rehearsal?

The analysis in this section will focus on four groups of items: those that showed increase when the advanced level was compared to lower levels, those that showed decrease, those that measured the aspect of language play, and those that measured the affective function of inner speech.

Aspects of inner speech that showed increase. (See Table 3.) Items 3 to 6, which test the structural complexity of inner speech in terms of the extent to which it consists of words, phrases, sentences, and conversations/dialogues, showed increase in comparison with figures obtained for the lower levels. This tendency was also observed for the L1 group in the present sample.[10] The increase in frequency of sentences and conversations/dialogues had been statistically significant among the lower levels in the previous study. The trend toward more complex syntactic and discourse inner speech structures as proficiency increases is thus confirmed. Although more proficient learners are capable of more complex and elaborate inner speech structures than lower learners, words and phrases, however, continue to be more frequent than more complex structures, just as they were within the lower groups. This finding supports Vygotsky's (1986) hypothesis that the predominant structural characteristic of inner speech is reduction (or abbrevia-

tion).

Item 7, which refers to the phonological nature of inner speech, also produced an increase (see Table 3). This increase had been significant among the lower levels in the previous study, and again the upward trend continues, indicating that as proficiency in English increases, so does the likelihood of hearing that language in the mind. The L1 students in the present sample reported 100% affirmative responses for this item. This finding confirms the definite sonority of inner speech in the mind, even though it is overtly soundless, as Sokolov (1972) pointed out. The sonorous nature of inner speech results from auditory memory being activated while motor speech production is inhibited. Because more of the L2 is stored in auditory memory among advanced L2 learners, their chances of hearing the sounds of that language in the mind are greater. Similarly, item 14 (Do you hear in your mind voices of other people in English?), which refers to the occasional polyphonic nature of inner speech (Trimbur, 1987), yielded an increase, though very small. In comparison, the L1 learners in the present sample had a higher percentage of affirmative responses (L2 learners: 60%, L1 learners: 72%), a finding which suggests this phenomenon is definitely not restricted to L2 learners.[11]

In item 10 (When you mentally rehearse, do you try to make sentences with certain words?), the increase is small when compared to lower levels (see Table 3). This finding, however, suggests that even very advanced L2 learners use this self-instructional strategy for learning the L2. Curiously, the L1 students reported 89% affirmative responses for this item, an even higher percentage than for any of the L2 levels.

Item 13 (When you mentally rehearse, do your thoughts in English make sense?) confirms what had been found in the previous study, namely, that with more proficiency in the language, inner speech will become more and more meaningful (see Table 3). One of Krashen's (1983) speculations was that the Din (the involuntary rehearsal of the L2) was set off by comprehensible input, which, as the hypothesis goes, has i + 1, structures that are beyond the learner's grasp, so that actually comprehensible input is really incomprehensible to some extent. This led Krashen to speculate that the Din would disappear with proficiency: As there is less i + 1 to grapple with, so is there less Din, less rehearsal. What the present study shows is that, as proficiency increases, inner speech does seem to deal with less incomprehensible language but that it does not disappear. Rather, as proficiency in the L2 develops, inner speech appears to function less and less as an instrument for dealing with what is incomprehensible in the language and more and more as a tool for organizing and clarifying thought. In other words, rehearsal as an inner speech activity does not die out: Its functions change. It is therefore not surprising that, for the L1 group in the present sample, item 13 yielded 100% of affirmative responses.

Item 24 (Do you catch yourself thinking in English about things not related to your English class?) reveals quite a major increase (see Table 3) for the ad-

Table 3: Aspects of Inner Speech as Mental Rehearsal that Increased with Proficiency

Item	Guerrero (1990/1991, 1994)	Present sample
	Low/Int./High Mean	Advanced
3. Is your inner speech made up of words?	86	89
4. Is your inner speech made up of phrases?	79*	87
5. Is your inner speech made up of sentences?	70*	85
6. Is your inner speech made up of conversations or dialogues?	53*	72
7. Can you "hear" the sounds of English in your mind?	86*	91
10. When you mentally rehearse, do you try to make sentences with certain words?	81	85
13. When you mentally rehearse, do your thoughts in English make sense?	95*	98
14. Do you hear in your mind voices of other people in English?	58	60
24. Do you catch yourself thinking in English about things not related to your English class?	63*	89
27. Do you imagine dialogues or conversations with other people in English?	69*	76
28. Do you talk to yourself in English?	62*	80
40. Is your inner speech in English mixed with Spanish?	69*	76

Note: Figures are for percentages of Yes (*sometimes* to *always*) responses. Low/Int./High Mean = mean percentage for low, intermediate, and high proficiency levels. *Differences among low, intermediate, and high levels were statistically significant.

vanced learners. It seems that as learners reach very high levels of knowledge of the L2 and make more natural use of it, inner speech becomes a very important alternative tool for thinking in the other language about all kinds of things, not just things associated with their English class. The same percentage (89%) of Yes responses was observed for the L1 group in this study. Consistent with these results, item 25 (Is your inner speech related to your English class?) went down in frequency for the advanced L2 learners, as will be seen in Table 4.

Item 27 (Do you imagine dialogues or conversations with other people in English?) and item 28 (Do you talk to yourself in English?) refer respectively to the interpersonal and intrapersonal roles of inner speech. As can be seen in Table 3, the data confirm the upward trend found in the previous study. The interpersonal and intrapersonal roles are uses of inner speech that are frequently reported by L1 speakers (Cunningham, 1989; Honeycutt, Zagacki, & Edwards, 1989; Smith, 1983) so it is no surprise that advanced L2 learners report a high frequency of them, too. In fact, the L1 students in the present study reported even higher frequencies than the advanced L2 students (item 27: 83%, item 28: 94%). Intrapersonal communication, either directed to imagined others or to the self, can only occur when the individual has achieved the capacity for self-consciousness and self-awareness. In Vygotsky's theory, inner speech is the tool which facilitates the "higher intellectual functions, whose main features are reflective awareness and deliberate control" (1986, p. 166). Inner speech is thus an important mediator of self-consciousness among adults (Morin & Everett, 1990; Siegrist, 1995).[12] For adult learners, who are already capable of exercising self-consciousness in their own language, the L2—as this study shows—becomes an alternative cognitive tool for self-awareness and reflection.

Item 40 (Is your inner speech in English mixed with Spanish?) shows an increase when compared with the lower levels (see Table 3). It is possible to see in the mixed English-Spanish nature of the participants' inner speech a reflection of their growing bilingual mind, one which strategically avails itself of two languages, as the need, situation, or context arises. The L1 group in this study, however, reported a lower frequency (61%) in their bilingual nature of inner speech, possibly because their knowledge of Spanish was more limited than for the L2 group. At any rate, because L2 adult learners have already developed inner speech in their L1, it may be very difficult, as Ushakova (1994) claims, to eliminate the influence of the L1 on L2 inner speech.

Aspects of inner speech that showed decrease. (See Table 4.) As determined in the previous study (Guerrero, 1990/1991, 1994), inner speech as mental rehearsal has many functions. One of these is the evaluative role, that is, the use of inner speech to assess or correct the learner's own knowledge of the L2 and that of others. The present data show that all the items that tapped the evaluative role (#19, 20, 21, 23, 26) went down. It is apparent that, as students become more confident about their language knowledge, they become less concerned with correcting and monitoring their own language. Interestingly, the use of inner speech

Table 4: Aspects of Inner Speech as Mental Rehearsal that Decreased with Proficiency

Item	Guerrero (1990/1991, 1994)	Present sample
	Low/Int./High Mean	Advanced
8. When you mentally rehearse, do you repeat words you want to learn?	96	83
9. When you mentally rehearse, do you try to imitate the pronunciation of words you have learned?	96	80
11. When you mentally rehearse, do you try to recall words you have learned?	98	80
12. When you mentally rehearse, do words with meanings you do not know well come to your mind?	85	72
15. Do you repeat aloud any of the words of that inner speech when you are alone?	73	59
16. Do you look up in a book or dictionary the meaning of English words that come to your mind?	62	61
17. If you have to talk to someone in English or you have an oral presentation, do you mentally rehearse what you are going to say?	92	85
18. If you have to write something in English, do you rehearse first in your mind what you are going to write?	93	83
19. Do you ever think how you would say or write something in English, even if you are not going to use it?	83	76
20. Do you try to correct the pronunciation of words in your mind?	94	83
21. Do you try to correct the grammar errors when you mentally rehearse in English?	77*	72
22. Do you try to apply the grammar rules you have learned to your inner speech in English?	76	67
23. When you hear other people speaking English, do you mentally evaluate how those people use the langauge?	90	85

Table 4 (continued)

Item	Guerrero (1990/1991, 1994)	Present sample
	Low/Int./High Mean	Advanced
25. Is your inner speech in English related to your English class?	77	70
26. When your English teacher asks a question in class, do you answer it in your mind even though you are not called to answer?	97	94

*Differences among low, intermediate, and high ESL levels were statistically significant.

to evaluate other people's language is a little higher than using inner speech for self-evaluation. Item 26 (When your English teacher asks a question in class, do you answer it in your mind even though you are not called to answer?) remains high, in spite of a very small reduction. My interpretation is that this is a general cognitive strategy characteristic of classroom settings, probably used by most students regardless of the subject matter being taught.[13]

Results for item 16 show a very slight decrease in the frequency with which advanced learners use the strategy of looking up in a book or dictionary the meaning of unknown words that come into their minds. In contrast, items 17 and 18, which address the textual function of inner speech, that is, its use in mentally practicing a text—oral or written—before delivering it, showed a considerable reduction. These items had obtained very high percentages in the previous study (item 17: 92%; item 18: 93%). My interpretation for both item 17 and item 18, that is, rehearsing texts for future oral and written production, is the same as for the evaluative items: The more confident the learners are about their language abilities, the less they practice ahead of time.

A great reduction was observed in items 8, 9, 11, 12, and 22 (see Table 4). These items address basically two roles: the mnemonic role (items 8, 11, and 12), that is, inner speech as an instrument for the storage and retrieval of language, and the instructional role (items 9 and 22), that is, inner speech as a tool for self-teaching the language. All these items refer to very typical behaviors associated with language rehearsal. As can be seen in Table 4, many of these were extremely high in the previous study, for example, items 8 and 11, which have very important mnemonic functions.

The importance of mental rehearsal as an aid for long-term retention cannot be underestimated. Rehearsal (both rote and elaborative) in short-term (working) memory has for years been associated with long term retention (see review of

literature in Guerrero, 1987). Recent studies stress the importance of rehearsal for long-term retention of foreign vocabulary (Ellis & Sinclair, 1996; Service, 1992; Wang, Thomas, Inzana, & Primicerio, 1993). A study by Service (1992) highlights the role that working memory plays in FL acquisition. According to Service, working memory consists of the central executive, a system that organizes information from long term memory, and two subsystems, the articulatory loop, which handles verbal oral material, and the visuo-spatial sketchpad, which deals with visual images. The articulatory loop not only holds phonological input but also functions as an active articulatory rehearsal process. This process is activated when learning FL vocabulary and is crucial for long-term retention. It should be observed that in the present study, all the items tapping the mnemonic role (#8, 11, 12) have to do with words, that is, with vocabulary. In addition, Service (1992), mentions that words that sound unfamiliar are more difficult to keep in the phonological store and that "a number of rehearsal cycles might be necessary to establish an association between form and meaning, or just to strengthen the distinctiveness of the form" (p. 45). Service may very well be offering here an explanation for the phenomenon Krashen called "din in the head." In my study of the Din (Guerrero, 1987), I pointed out the connections between this phenomenon and what psychologists refer to as spontaneous recall, rote or maintenance rehearsal, and elaborative rehearsal.[14]

Furthermore, Ellis and Sinclair (1996) have found that "short-term repetition of FL utterances allows the consolidation of long-term representation of words and sequences" (p. 246). The authors believe that "intrinsic phonological memory skills may influence the learning of new words .... This is true for foreign as well as for native language. The novice FL learner comes to the task with a capacity for repeating native words" (p. 244). The fact that new word repetition is not restricted to novice FL or L2 learners and can even be found among native speakers, as observed by Ellis and Sinclair, is attested by the findings of the present study, which show an 83% among the L2 learners and an 89% of affirmative responses among the L1 group to item 8 (When you mentally rehearse, do you repeat words you want to learn?). The considerable reduction in frequency that occurs in terms of the mnemonic role of inner speech, however, when advanced learners are compared to lower proficiency groups (as indicated by items 8, 11, and 12 in Table 4) is an important finding, suggesting that the need to rehearse new or difficult vocabulary is smaller as fewer words result unfamiliar to the learner with increased knowledge of the language and that the processes of storing and retrieving have acquired a greater degree of automaticity.

The aspect of language play. Several of the items that showed decrease (#8, 9, 11, 12, 15) are very similar to Lantolf's (1997) examples of language play (see p. 33 in this paper). Lantolf had found a reduced use of language play among the more advanced learners. The data in the present study are thus consistent with Lantolf's (1997) findings. His explanation of why advanced L2 learners play less with the L2 is a plausible one: Advanced L2 learners play less with the L2 because

discrepancies between the learners' internal systems and the external models are greatly reduced, and so is the learners' need to resolve conflicts through internal language play. In other words, the need to create an inner zone of proximal development through language play greatly diminishes among advanced learners, just as play is no longer crucial for children's development as they reach a more mature age.

Within the language play items, number 15 (Do you repeat aloud any of the words of that inner speech when you are alone?) specifically refers to private speech, that is, speech to oneself which is vocalized. Both Lantolf's and the present data thus suggest that private "audible" speech decreases with proficiency, although it does not disappear altogether. This finding is consistent with Vygotsky's hypothesis that egocentric speech becomes less frequent as it turns into inner speech. In this view, as human beings grow, they become increasingly self-regulated through the medium of inner speech, though access to private speech, that is, actually vocalizing the language, is always possible, even for adults, as a mechanism for regaining control, particularly when facing difficult tasks. (See Frawley & Lantolf, 1985, and Lantolf & Frawley, 1984, on the principle of "continuous access" to ontogenetically prior forms of control among L2 learners.)

The above findings are also very consistent with the results shown by the new items included in this questionnaire on language play (#29, 30, 31, 32) (see Table 5). Although these are new items and there is no basis for comparison with lower proficiency learners, it is plain that the percentages of affirmative responses for these items are lower than for all of the other inner speech functions.[15] Actually, frequencies tend to cluster around the lower categories, as indicated by the corresponding modes and medians. It should be pointed out that what is measured

Table 5: Inner Speech as Language Play among Advanced L2 Students (n = 46)

Item	Categories/Values					No	Yes	Mode	Median
	0	1	2	3	4				
Do you "play" with your inner speech in English, for example . . .									
29. do you make up rhymes?	23.9	26.1	17.4	21.7	10.9	50	50	1	1.5
30. do you invent funny or original combinations?	23.9	23.9	28.3	23.9	-	48	52	2	2
31. do you invent your own words?	30.4	30.4	19.6	17.4	2.2	61	39	0,1	1
32. do you experiment with the order of words?	19.6	28.3	23.9	26.1	2.2	48	52	1	2

Note: Figures are for percentages of responses. Values stand for the following categories: *never* (0), *almost never* (1), *sometimes* (2), *often* (3), *always* (4). No = categories *never* and *almost never*. Yes = categories *sometimes*, *often*, and *always*.

in these items are very creative aspects, very "playful" aspects of the language, perhaps even more so than the aspects that Lantolf (1997) included in his questionnaire in language play.

The affective function of inner speech. The affective function of inner speech during mental rehearsal was measured by means of items 33 to 39. This function, which had been reported by lower proficiency learners during the interviews in the previous study, had shown mental rehearsal to have various specific roles: to obtain self-satisfaction, to reduce nervousness, to acquire self-confidence, to entertain oneself, and to improve the learner's self-image. The present data reveal that for advanced L2 learners inner speech as mental rehearsal is an exceedingly positive affective experience rather than negative, as evidenced by the participants' responses to item 33 (Does your inner speech in English make you feel good?), which obtained 96% Yes responses, and to item 34 (Does your inner speech in English make you feel bad?), which yielded only 9% affirmative answers. Inner speech also emerged as a powerful instrument to gain self-confidence (item 36, 93% Yes responses) and to derive self-diversion in the L2 (item 37, 87% Yes responses). More moderate frequencies were reported for the use of inner speech to reduce nervousness, anxiety, or apprehension (item 35, 74% Yes responses) and to increase self-esteem (item 38, 54% Yes responses). Inner speech in English was found to be very little used by the learners to criticize or punish themselves (item 39, 35% Yes responses). These findings thus confirm in a quantitative way the students' qualitative self-reports of the previous study about the existence of an important affective dimension of inner speech during mental rehearsal of the L2.

CONCLUSIONS

On the basis of evidence provided by a group of advanced ESL learners as compared to previously reported data from lower proficiency students, it is possible to conclude that advanced L2 learners experience inner speech in the second language to a great extent and that, although the frequency of this inner speech increases with proficiency, some of the functions associated with silent rehearsal become less frequent. This study thus clarifies some of the conflicting results of previous research concerning the increase of L2 inner speech as manifested in mental rehearsal. My recommendation for future studies is then not to generalize about mental rehearsal, language play, or inner speech, but to pay close attention to the particular functions and the different manifestations that inner speech adopts.

To summarize, advanced students report higher levels of structural complexity in their L2 inner speech, with words predominating as the typical abbreviated form of inner speech, but with increased ability to think in longer, more elaborate structures such as sentences and conversations, as for example when learners engage in imaginary talk with others and in self-talk. Inner speech in the L2 is highly sonorous and meaningful for these advanced students, even more so than for lower level learners. At an advanced level, therefore, inner speech in the other

language seems to approximate the status of L1 inner speech as it becomes a rich, powerful, and effective cognitive tool used for general thinking purposes.

As these properties of inner speech in the L2 consolidate, certain functions which were distinctive among the lower levels tend to lose their strength. Advanced L2 learners report using less inner speech for certain aspects of rehearsal than lower level learners. Specifically, advanced learners engage in less rehearsal for planning texts, for self- and other-evaluation, for memory storage and retrieval, for self-teaching the language, and for what may be termed language play. This does not mean that rehearsal disappears altogether, but apparently there is less need to use inner speech for those purposes. Thus, the phenomenon known as Din is likely to decrease or disappear, as some studies indicate. This variety of rehearsal has a very restricted role. As Barber (1980) and Krashen (1983) described it, the Din is an involuntary, spontaneous type of rehearsal, in which L2 words suddenly pop out in the learner's head after being exposed to oral input. It seems this type of rehearsal is a natural way of coping with information stored in memory which has not been completely understood, thus the spontaneous recall, the "chewing" on data in short-term memory, and the cycles of storage-retrieval-storage that are associated with the phenomenon. These are instances of inner speech, no doubt, but as such they are very far from the ideational, higher-order thinking processes that Vygotsky attributed to full-fledged inner speech.

It can be concluded then that, just as in the L1, inner speech in the L2 appears to be developmental in nature. In its path from the social, interpersonal, communicative sphere where it originates to its culmination as enabler of personal, idiosyncratic, verbal thought, L2 inner speech changes. An evolution is thus posited in which L2 inner speech starts out as involuntary mental playback of the L2, representing the internal projection of external speech, a sort of internal "echo" of the speech being heard, as Sokolov (1972, p. 1) expressed in reference to L1 inner speech and as the Din phenomenon suggests. L2 inner speech functions in its early stages as a very active analyzer of language, chewing on unknown or not fully understood language (words, sounds, structures) in the input, resolving conflicts between internal and external models of the L2, and carefully, though covertly, monitoring production. As proficiency and confidence in the L2 grow, inner speech acts less and less as analyzer, planner, and monitor, and more and more as a swift mechanism for conducting verbal tasks and for thinking in general. Gradually, inner speech in the L2 becomes the flexible instrument that it is in the L1, an effective means for thinking in words and a mediator of consciousness. It is at this point in the development of L2 inner speech, only attained by the most advanced of L2 speakers, that the L2 comes to share with the L1 that most intimate plane of personal experience, where thoughts, feelings and desires find the word that gives them shape.

In light of the findings of this follow-up study, I submit that the problem of L2 inner speech and its related manifestations is worth pursuing for SLA researchers. There is no denying, however, that embracing the problem entails acknowl-

edging the social-to-the-individual ideological premises of sociocultural theory. I propose that such a view not only makes justice to the social dimension of language learning but also enriches our perspective of the inner workings of the L2 mind. Many questions arise, however, that can be addressed in future research. If inner speech mediates consciousness, is there a different conscious self when an L2 operates?[16] Do advanced L2 language learners use their L1 and their L2 indiscriminately when thinking in words? What accounts for their preferred version of inner speech? More profoundly, is the structure of thought altered by the acquisition of another language, just as the structure of thought is altered by the acquisition of a first language? Of course, the problem of method remains. But even this should be no hindrance upon embarking on the study of L2 inner speech. All approaches to inner speech, from Vygotsky's genetic method, to the electromyographic techniques of cognitive psychophysiology, to introspection via diaries, interviews, or questionnaires, even to the latest brain scanning procedures, all have advantages and limitations, all pretend to make observable what remains unobservable, but they can all collectively contribute to a greater understanding of this most intriguing of L2 phenomena, inner speech.

ACKNOWLEDGMENTS

I would like to express my gratitude to editors Anna Guthrie and Tanya Stivers and the anonymous reviewers of this paper for their helpful comments and suggestions. I would also like to thank the administrators at Inter American University of Puerto Rico, Metropolitan Campus, for extending me a reduced course load that allowed me to devote time to this research.

APPENDIX: QUESTIONNAIRE ON INNER SPEECH AND MENTAL REHEARSAL OF THE SECOND LANGUAGE (ENGLISH VERSION)

The purpose of this questionnaire is to explore the "inner speech" that students of English as a second language experience as they are mentally rehearsing in English. The following definitions will help you understand the questionnaire better:

Inner speech is any type of language in English that occurs in your mind and that is not vocalized (spoken). Inner speech may include sounds, words, phrases, sentences, dialogues, and even conversations in English.
Mental rehearsal is a voluntary or involuntary activity by means of which students practice in their minds the language they have learned, heard, or read, or the language they will have to use in a future oral or written activity. When mentally rehearsing, the students may simply be recalling, repeating, or imitating words in the second language. Sometimes, mental rehearsal is more creative, as, for example, when the students imagine dialogues, plan what they are going to say or write, mentally self-correct, evaluate other students' language, or engage in conversations with themselves.
If you do not recognize these definitions, or you have never mentally rehearsed in English, do not worry. Answer the questions, anyway; your answers will be equally valuable.

The questionnaire has two parts. Part I will help the researcher determine what kind of contact with English you have had. Part II has questions on inner speech and mental rehearsal of the English language.

Try to answer as truthfully and precisely as possible and do not leave questions unanswered. You will have to write your name. This is only to enable the researcher to identify some students that may participate in a second phase of the study. The results of this questionnaire will only be used for research purposes.

Thank you very much for cooperating with this study.

Part I

1. Student name:_____
2. Age:_____
3. Female____ Male____
4. Place of birth:_____
5. English courses that you have taken in this university:_____
6. English course that you are taking now:_____
   Section_____Professor_____
7. What elementary school(s) did you attend?
   School(s):_____
   Place:_____
8. What intermediate school(s) did you attend?
   School(s):_____
   Place:_____
9. What high school(s) did you attend?
   School(s):_____
   Place:_____
10. Have you lived in the United States or in some other place where English is spoken?
    Yes____ No____ How long?_____
11. Which do you consider your first language?
    _____Spanish
    _____English
    _____other (specify)_____
12. Which language is spoken in your home?
    _____mostly Spanish
    _____mostly English
    _____both Spanish and English
    _____other (specify)_____

Part II

Instructions. Choose the alternative that you prefer and darken the corresponding space on the answer sheet

A	B	C	D	E
never	almost never	sometimes	often	always

1. Have you had inner speech in English? (You can read the definition again.)
2. Do you still experience inner speech in English?
3. Is your inner speech made up of words?
4. Is your inner speech made up of phrases?
5. Is your inner speech made up of sentences?
6. Is your inner speech made up of conversations or dialogues?
7. Can you "hear" the sounds of English in your mind?

When you mentally rehearse,
8. do you repeat words you want to learn?
9. do you try to imitate the pronunciation of words you have learned?
10. do you try to make sentences with certain words?
11. do you try to recall words you have learned?
12. do words with meanings you do not know well come to your mind?
13. do your thoughts in English make sense?
14. Do you hear in your mind voices of other people in English?
15. Do you repeat aloud any of the words of that inner speech when you are alone?
16. Do you look up in a book or dictionary the meaning of English words that come to your mind?
17. If you have to talk to someone in English or you have an oral presentation, do you mentally rehearse what you are going to say?
18. If you have to write something in English, do you rehearse first in your mind what you are going to write?
19. Do you ever think how you would say or write something in English, even if you are not going to use it?
20. Do you try to correct the pronunciation of words in your mind?
21. Do you try to correct grammar errors when you mentally rehearse in English?
22. Do you try to apply the grammar rules you have learned to your inner speech in English?
23. When you hear other people speaking English, do you mentally evaluate how those people use the language?
24. Do you catch yourself thinking in English about things not related to your English class?
25. Is your inner speech in English related to your English class?
26. When the English teacher asks a question in class, do you answer it in your mind even though you are not called to answer?
27. Do you imagine dialogues or conversations with other people in English?
28. Do you talk to yourself in English?
Do you "play" with your inner speech in English, for example . . .
29. . . . do you make up rhymes?
30. . . . do you invent funny or original combinations?
31. . . . do you invent your own words?
32. . . . do you experiment with the order of words?
33. Does your inner speech in English make you feel good?
34. Does your inner speech in English make you feel bad?
35. Does your inner speech in English reduce your nervousness, anxiety, or apprehension?
36. Does your inner speech in English give you self-confidence?
37. Does your inner speech in English entertain you and help you pass the time?
38. Do you use your inner speech in English to increase your self-esteem?
39. Do you use your inner speech in English to criticize or punish yourself?
40. Is your inner speech in English mixed with Spanish?

NOTES

[1] In a review of the current available literature, only two studies emerged dealing strictly with inner speech from an L2 perspective: Guerrero's (1990/1991, 1994), of which the present study constitutes a follow-up, and Ushakova's (1994), a summary of theoretical and experimental studies on L2 inner speech conducted in Russia.

[2] Vygotsky (1986) was outspoken about his philosophical approach to inner speech and verbal thought (thought mediated by inner speech): "Verbal thought is not an innate, natural form of behavior, but is determined by a historical-cultural process . . . . Once we acknowledge the historical character of verbal thought, we must consider it subject to all the premises of historical materialism" (pp. 94-95).

[3] The sociocultural view of mind and language development is clearly not the dominant one in

current SLA research. As de Bot (1996) suggests, the information-processing perspective of mainstream SLA research makes it difficult to adopt Vygotskyan theoretical insights because "notions from these two paradigms do not fit together well" (p. 553).

[4] My focus does not lie on L2 inner speech as a problem-solving tool, for example, or as it manifests in L2 reading and writing, although whether, how, and to what extent inner speech is involved in these activities are topics extremely rich in research potential and as yet unexplored. Neither am I involved in the study of "private speech" in the L2, a phenomenon closely associated with inner speech, both in nature as well as developmentally (for a review of studies on L2 private speech, see McCafferty, 1994; see also Lantolf, DiCamilla, & Ahmed, 1997). Although inner and private speech may be subsumed under the category "language for thought" (Frawley, 1997, p. 183), private speech remains the audible, vocalized (thus, social in form) counterpart of inner speech. My object of interest in this paper is the internal, covert manifestations of the phenomenon, and thus the data collected for this study are restricted (with the exception of item 15) to nonvocalized inner speech. Further research may pursue the question of whether inner and private speech are identical phenomena or there exist worth noting differences between the two.

[5] The overall population of Inter American University of Puerto Rico, Metropolitan Campus, which fluctuates between 11,000 and 14,000, is 90% ESL, having Spanish as their L1.

[6] The reading Din is apparently not restricted to foreign language readers. In a related study, McQuillan (1996) found that advanced L1 readers (4 subjects) reported experiencing an involuntary Din after being engaged in pleasure reading.

[7] Some of these had to do with the structural nature of inner speech (original items #17 and #18), some had to do with the textual function of inner speech (original items #21 to 24), and one had to do with the ideational role of inner speech (original item #30). These items were not considered essential for purposes of the present study.

[8] No significant differences in the students' responses to the questionnaire were found in terms of gender, except for two items: Item 10, in which males had a larger percentage (28%) of No responses than females (8%) [χ^2 (1, N = 68) = 4.566, p<.03], and item 37, in which males also had a larger percentage (29%) of No responses than females (6%) [χ^2 (1, N = 68) = 3.928, p<.04]. These rather minimal gender differences will not be pursued in the main body of the text.

[9] None of the items in the questionnaire yielded significant differences in terms of Yes/No responses between the L1 and L2 groups, as indicated by the multiple-sample chi-square test.

[10] For the L1 students in the present study (n = 18), affirmative responses were the following: item 3, 94%; item 4, 89%; item 5, 83%; item 6, 83%.

[11] In fact, the hallucinatory voices some schizophrenic patients report have been associated with involuntary inner speech in the L1 (Hoffman & Satel, 1993).

[12] According to Morin and Everett (1990), individual differences in self-consciousness and self-knowledge could be partially explained by the extent to which inner speech is used. Six-year-old children, for example, did not evidence use of inner speech in self-aware conditions (Morin & Everett, 1991). In connection to this, an interesting research question would be whether the development of inner speech in the L2 has an effect on learners' metacognitive strategies. Is there a correlation between the learners' increased use of L2 inner speech and their capacity for self-reflection on cognitive processes? Furthermore, can L2 inner speech operate below the level of consciousness (as an anonymous reviewer wonders), or is it always "self-directed language for *metaconscious* [italics added] control," as Frawley (1997, p. 7) suggests?

[13] Reiss (1985) had mentioned it as an L2 strategy.

[14] The cyclical nature of rehearsal was also a finding in Guerrero (1990/1991, 1994). In that study, it was possible to establish through the students' interviews the occurrence of circular patterns of memorization in which the learners alternately retrieved words from memory, rehearsed them, and again stored them for further retrieval and rehearsal.

[15] The one sample chi-square test indicated that the difference between Yes and No answers was not significant in these four items.

[16] Pavlenko (1998) offers rich insights into some of these questions in her analysis of bilinguals' narratives of their L2 learning experience. Her data show the processes by which people can actually become different selves as they get socialized into a new language, processes involving

shifts in language identity, loss of the inner voice in the L1 and emergence of a new voice in the L2, and the difficulty—indeed, sometimes the impossibility—of translating one's experience in one language into another. (I thank an anonymous reviewer for pointing out this relevant research reference.)

REFERENCES

Barber, E. J. W. (1980). Language acquisition and applied linguistics. *ADFL Bulletin*, *12*, 26-32.

Bedford, D. A. (1985). Spontaneous playback of the second language: A descriptive study. *Foreign Language Annals*, *18*, 279-287.

Beggs, W. D. A., & Howarth, P. N. (1985). Inner speech as a learned skill. *Journal of Experimental Child Psychology*, *39*, 396-411.

Chamot, A. U. (1987). The learning strategies of ESL students. In A.Wenden & J. Rubin (Eds.), *Learner strategies in language learning* (pp. 71-83). Englewood Cliffs, NJ: Prentice Hall.

Cohen, A. (1987). Studying second-language learning strategies. How do we get the information. *Applied Linguistics*, *5*, 107-112.

Cunningham, S. B. (1989). Defining intrapersonal communication. In C. V. Roberts & K. W. Watson (Eds.), *Intrapersonal communication processes* (pp. 82-94). New Orleans, LA: Spectra.

de Bot, K. (1996). The psycholinguistics of the output hypothesis. *Language Learning*, *46*, 529-555.

Doran, S. (1989). A look at the din phenomenon as the connection between "psycho" and "linguistics": A descriptive study of second language mental behavior at the high school level. Unpublished manuscript. Inter American University of Puerto Rico, English Department.

Ellis, N. C., & Sinclair, S. G. (1996). Working memory in the acquisition of vocabulary and syntax. *The Quarterly Journal of Experimental Psychology*, *49A* (1), 234-250.

Ericsson, K. A., & Simon, H. A. (1980). Verbal reports as data. *Psychological Review*, *87*, 215-251.

Flower, L. (1984). Writer-based prose: A cognitive basis for problems in writing. In S. McKay (Ed.), *Composing in a second language* (pp. 16-42). Rowley, MA: Newbury House.

Frawley, W. (1997). *Vygotsky and cognitive science*. Cambridge, MA: Harvard University Press.

Frawley, W., & Lantolf, J. P. (1985). Second language discourse: A Vygotskyan perspective. *Applied Linguistics*, *6*, 19-44.

Guerrero, M. C. M. de. (1987). The din phenomenon: Mental rehearsal in the second language. *Foreign Language Annals*, *20*, 537-548.

Guerrero, M. C. M. de. (1991). Nature of inner speech in mental rehearsal of the second language (Doctoral Dissertation, Inter American University of Puerto Rico, 1990). *Dissertation Abstracts International*, *51*, 4044A.

Guerrero, M. C. M. de. (1994). Form and functions of inner speech in adult second language learning. In J. P. Lantolf & G. Appel (Eds.), *Vygotskian approaches to second language research (pp. 83-115)*. Norwood, NJ: Ablex.

Hoffman, R. E., & Satel, S. L. (1993). Language therapy for schizophrenic patients with persistent "voices." *British Journal of Psychiatry*, *162*, 755-758.

Honeycutt, J. M., Zagacki, K. S., & Edwards, R. (1989). Intrapersonal communication, social cognition, and imagined interactions. In C. V. Roberts & K. W. Watson (Eds.), *Intrapersonal communication processes* (pp. 166-184). New Orleans, LA: Spectra.

Johnson, J. R. (1984). The role of inner speech in human communication. *Communication Education, 33*, 211-222.

Krashen, S. D. (1983). The din in the head, input, and the language acquisition device. *Foreign Language Annals, 16*, 41-44.

Kozulin, A. (1986). Vygotsky in context. In A. Kozulin (Ed.), Lev Vygotsky's *Thought and language* (pp. xi-lvi). Cambridge, MA: The MIT Press.

Kuhn, T. S. (1972). *The structure of scientific revolutions* (2nd ed.). Chicago: The University of Chicago Press.

Lantolf, J. P. (1997). The function of language play in the acquisition of L2 Spanish. In A. T. Pérez-Leroux & W. R. Glass (Eds.), *Contemporary perspectives on the acquisition of Spanish. Volume 2: Production, processing, and comprehension* (pp. 3-24). Somerville, MA: Cascadilla Press.

Lantolf, J. P., DiCamilla, F. J., & Ahmed, M. (1997). The cognitive function of linguistic performance: Tense/Aspect use by L1 and L2 speakers. *Language Sciences, 19*, 153-165.

Lantolf, J. P., & Frawley, W. (1984). Second language performance and Vygotskyan psycholinguistics: Implications for L2 instruction. In A. Manning, P. Martin., & K. McCalla (Eds.), *The tenth LACUS Forum, 1983* (pp. 425-440). Columbia, SC: Hornbeam Press.

Luria, A. R. (1982). *Language and cognition.* New York: John Wiley & Sons.

McCafferty, S. G. (1994). Adult second language learners' use of private speech: A review of studies. *The Modern Language Journal, 78*, 421-436.

McQuillan, J. (1996). Reading, language acquisition, and the "Din in the Head": Involuntary mental rehearsal in the first language. *ITL Review of Applied Linguistics, 113-114*, 305-320.

McQuillan, J., & Rodrigo, V. (1995). A reading "din the head": Evidence of involuntary mental rehearsal in second language readers. *Foreign Language Annals, 28*, 330-336.

Morin, A., & Everett, J. (1990). Inner speech as mediator of self-awareness, self-consciousness, and self-knowledge: An hypothesis. *New Ideas in Psychology, 8*, 337-356.

Morin, A., & Everett, J. (1991). Self-awareness and "introspective" private speech in 6-year-old children. *Psychological Reports, 68*, 1299-1306.

Murphey, T. (1990). The song stuck in my head phenomenon: A melodic din in the LAD? *System, 18*, 53-64.

O'Malley, J. M., Chamot, A. U., Stewner-Manzanares, G., Russo, R., & Küpper, L. (1985). Learning strategy applications with students of English as a second language. *TESOL Quarterly, 19*, 557-584.

Oxford, R. L. (1996). Employing a questionnaire to assess the use of language learning strategies. *Applied Language Learning, 7*, 25-45.

Parr, P. C., & Krashen, S. (1986). Involuntary rehearsal of second languages in beginning and advanced performers. *System, 14*, 275-278.

Pavlenko, A. (1998). Second language learning by adults: Testimonies of bilingual writers. *Issues in Applied Linguistics, 9*(1), 3-19.

Reiss, M. (1985). The "good" language learner: Another look. *The Canadian Modern Language Review, 41*, 511-523.

Rohrer, J. (1987). Inner speech. Implications for foreign language learning. *Die Nueren Sprachen, 86*, 92-101.

Rubin, J. (1987). Learner strategies: Theoretical assumptions, research history and typology. In A. Wenden & J. Rubin (Eds.), *Learner strategies in language learning* (pp. 15-30). Englewood Cliffs, NJ: Prentice Hall.

Service, E. (1992). Phonology, working memory, and foreign-language memory. *The Quarterly Journal of Experimental Psychology, 45A*, 21-47.

Sevilla, J. M. (1996). Involuntary rehearsal of second language at the elementary level: Do elementary school children experience the din in the head? *System, 24*, 101-105.

Siegrist, M. (1995). Inner speech as a cognitive process mediating self-consciousness and inhibiting self-deception. *Psychological Reports, 76*, 259-265.

Smith, F. (1983). *Essays into literacy*. London: Heinemann Educational Books.

Sokolov, A. N. (1972). *Inner speech and thought*. New York: Plenum.

Tarone, E. (1983). Some thoughts on the notion of "communication strategy." In C. Faerch & G. Kasper (Eds.), *Strategies in interlanguage communication* (pp. 4-14). New York: Longman.

Trimbur, J. (1987). Beyond cognition: The voices of inner speech. *Rhetoric Review, 5*, 211-221.

Vygotsky, L. S. (1978). *Mind in society. The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Vygotsky, L. S. (1986). *Thought and language*. Cambridge, MA: The MIT Press.

Wang, A., Thomas, M. H., Inzana, C. M., & Primicerio, L. J. (1993). Long term retention under conditions of intentional learning and the keyword mnemonic. *Bulletin of the Psychometric Society, 31*, 545-547.

Wertsch, J. (1985). *Vygotsky and the social formation of mind*. Cambridge, MA: Harvard University Press.

María C. M. de Guerrero is Professor of English and Linguistics at the English Department of Inter American University of Puerto Rico, Metropolitan Campus. She has published articles in *Foreign Language Annals*, *The Modern Language Journal*, *The Journal of Second Language Writing*, *Applied Linguistics*, and in Lantolf and Appel's (1994) *Vygotskian approaches to second language research*. She is currently interested in the application of sociocultural theory to second language learning. Direct correspondence to Inter American University of Puerto Rico, English Department, P.O. Box 191293, San Juan, PR 00919-1293