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# MLJ Response Article

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## How Does Anxiety Affect Second Language Learning? A Reply to Sparks and Ganschow

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The linguistic coding deficit hypothesis, introduced by Sparks and Ganschow (1991, 1993a, 1993b), postulates that language aptitude is the primary source of individual differences in language achievement. This may be seen to reduce affective variables, such as language anxiety, to the role of unfortunate side effects, devoid of explanatory power. This paper advocates that language anxiety can play a significant causal role in creating individual differences in both language learning and communication. It reviews evidence from investigations of anxiety in general and studies of the role of anxiety in the language learning processes and concludes that the linguistic coding deficit hypothesis makes a significant omission by assigning mere epiphenomenal status to affective variables in general and language anxiety in particular.

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FOR MANY STUDENTS, LANGUAGE COURSES are the most anxiety-provoking courses that they take (Horwitz, Horwitz & Cope, 1986; MacIntyre & Gardner, 1989, 1991b), and several authors have expressed concern over the amount of anxiety present in language classes (Cope-Powell, 1991; Muchnick & Wolfe, 1982). Campbell and Ortiz (1991) considered the levels of language anxiety among university students to be "alarming" (p. 159) and estimated that up to one half of all language students experience debilitating levels of language anxiety. In general, language learning contexts appear to be particularly prone to anxiety arousal (Price, 1991).

In the general literature on second language

learning, there has been some question about whether anxiety exerts an important influence on second language learning. Despite the experiences of students, teachers, and administrators, early empirical studies were ". . . unable to establish a clear picture of how anxiety affects language learning and performance" (Horwitz & Young, 1991, p. xiii). In 1978, a review of the sparse literature concerning anxiety's role in language learning pointed to "mixed and confusing" results (Scovel, 1978, p. 132). More recently, Horwitz and Young (1991) noted that "Exactly how anxiety impedes language learning has not been resolved" (p. 177). Finally, recent articles dealing with Sparks and Ganschow's linguistic coding deficit hypothesis (LCDH) (Sparks & Ganschow, 1991, 1993a, 1993b) have relegated language anxiety to the status of an unfortunate side effect. The purpose of the present discussion is to demonstrate that lan-

guage anxiety can influence language learning by describing the processes that are believed to underlie its effects. The second purpose is to show that the LCDH is incomplete as an explanation for individual differences in second language learning without formally considering affective variables, such as language anxiety.

Notwithstanding the difficulties cited in the preceding paragraph, a good deal of research has shown that anxiety is associated with problems in second language learning (MacIntyre & Gardner, 1991c). For example, Gardner, Smythe, Clément and Glikzman (1976) found that, as the grade level increased from grade 7 to grade 11, language anxiety became a better predictor of achievement in second language courses. Significant negative correlations between language anxiety and course grades have been reported for languages such as Japanese (Aida, 1994), Spanish (Horwitz, 1986), and French (MacIntyre & Gardner, 1991b). Language anxiety has also shown significant negative correlations with standardised proficiency tests, both written (Gardner, Lalonde, Moorcroft & Evers, 1987) and oral (Young, 1990). In addition, studies have shown that the rate of vocabulary learning is slower for students who report experiencing language anxiety (MacIntyre & Gardner, 1989, 1994a). Finally, factor analytic studies have shown consistently that language anxiety is associated with a factor defined by self-rated proficiency, actual proficiency, or both with the second language (Clément, Gardner & Smythe, 1977, 1980; Gardner, Smythe & Lalonde, 1984). To explain these effects, it is useful to place language anxiety into the broader context of the psychology of social anxieties.

#### LANGUAGE ANXIETY AS A SOCIAL ANXIETY

Almost everyone has experienced anxiety at some time or in some type of situation. A pronounced growth in research into the anxieties of everyday life has taken place over the past 10–20 years. These common forms of apprehension among psychologically healthy people can be broadly classified as social anxieties (Leary, 1990). It has been argued elsewhere that language anxiety stems primarily from the social and communicative aspects of language learning and therefore can be considered as one of the social anxieties (MacIntyre & Gardner, 1989, 1991b). This allows us to draw upon this broader body of work for explanations of the effects of anxiety in second language learning.

Most theorists agree that socially based anxieties have cognitive, affective, and behavioural components (Sarason, 1986; Spielberger, 1966, 1983). Social anxiety is defined by “(1) feelings of tension and discomfort, (2) negative self-evaluations, and (3) a tendency to withdraw in the presence of others” (Schwarzer, 1986, p. 1). The arousal of anxiety in any social situation can have these and other affective, cognitive, and behavioural consequences (Clevenger, 1984; Fischer, 1988). For example, the affective experience of anxiety includes feelings of apprehension, uneasiness, and fear (Whitmore, 1987). Among the cognitive effects are increases in distracting self-related cognition, expectations of failure, and a decrease in cognitive processing ability (Wine, 1980). The behavioural dimension includes reactions such as increases in sympathetic nervous system arousal, inhibited actions, and attempts to escape the situation (Levitt, 1980).

Within the current *Zeitgeist* of psychology, interest in the effects of anxiety is focused on the cognitive dimension (Schwarzer, 1986). This component of anxiety has received considerable research attention and has shown the strongest correlations with task performance (Holroyd & Appel, 1980). Sarason (1986) argued that this is not sufficient reason to ignore the emotional and behavioural aspects of anxiety altogether, but it does suggest value in studying the cognitive component in its own right. A focus on the cognitive dimension also provides a clear explanation for the negative effects of anxiety on language learning.

#### ANXIETY FROM A COGNITIVE PERSPECTIVE

The cognitive and affective components of anxiety were identified by Liebert and Morris (1967) as “worry” and “emotionality” respectively. Sarason (1986) defined worry as “. . . distressing preoccupations and concerns about impending events” (p. 21). This preoccupation often takes the form of self-related cognition, which is seldom beneficial for task performance. The basis for the negative effects of anxiety on cognitive activity were summarised by Eysenck (1979) who argued that:

worry and other task-irrelevant cognitive activities associated with anxiety always impair the quality of performance. The major reason for this is that the task-irrelevant information involved in worry and cognitive self-concern competes with task-relevant information for space in the processing system. As a

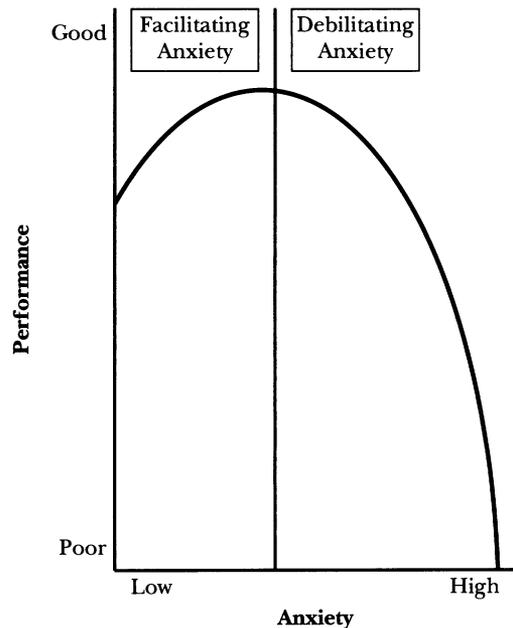
result, highly anxious subjects are effectively in a dual-task or divided attention situation, in contrast to the non-anxious subjects who primarily process task-relevant information (p. 364).

Whereas distractions caused by self-related cognition can explain the negative effects of anxiety on cognitive activity, it has been suggested that some anxiety may actually improve performance (Alpert & Haber, 1960; Scovel, 1978). To address this possibility, Eysenck (1979) further suggests that anxious individuals will compensate for the increased cognitive demands by increased effort and that "the extent to which anxiety either facilitates or impairs performance is determined by the extent to which high-anxiety subjects compensate for reduced processing effectiveness by enhanced effort" (p. 365). Thus, the arousal of anxiety can influence both the quality of performance and the amount of effort invested in it. Eysenck (1979) suggested that much of the research into the effects of anxiety has assumed that effort expenditure is relatively constant, and therefore the focus has been on the way in which anxiety effects the quality of performance.

Eysenck's (1979) theory is able to account for the often cited interaction between the effects of anxiety and ability on task performance (for example, Hunsley, 1985; Spielberger, 1983), similar to the well-known Yerkes-Dodson Law (Smith, Sarason & Sarason, 1982). This "law" describes a curvilinear relationship between anxiety and performance as a function of task difficulty (see Figure 1). To the extent that a given task is relatively simple, anxiety seems to have little negative effect and may actually improve performance through increased effort. However, as the demands on the system increase, the extra effort may not fully compensate for the cognitive interference, and anxiety will begin to have a negative effect. As demand further exceeds ability, the impairment caused by anxiety arousal worsens. Thus, those who do not experience anxiety will be able to process the information more quickly, more effectively, or both compared to those who are distracted by task-irrelevant cognition.

Whereas anxiety may cause deficits in cognitive processing and impair task performance, it should also be recognised that task performance can provoke anxiety (MacIntyre & Gardner, 1994a). There is no doubt that anxiety can be provoked by having difficulty in learning the language, but that is not to conclude that anxiety plays no role in contributing to such difficulties in the first place. These are two different

FIGURE 1  
Inverted "U" relation between anxiety and performance.



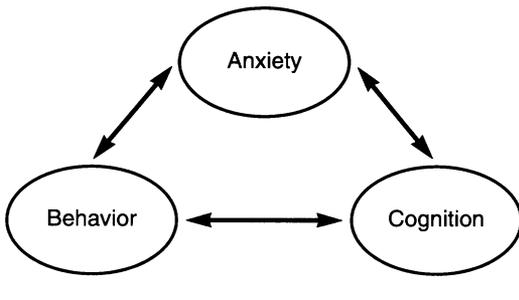
conclusions arising from a focus on two different points in the continuous, cyclical process involving anxiety, cognition, and behaviour.

#### RELATIONS AMONG ANXIETY, COGNITION, AND BEHAVIOUR

The relations among anxiety, cognition, and behaviour are best seen as recursive or cyclical, where each influences the other (Leary, 1990; Levitt, 1980). For example, a demand to answer a question in a second language class may cause a student to become anxious; anxiety leads to worry and rumination. Cognitive performance is diminished because of the divided attention and therefore performance suffers, leading to negative self-evaluations and more self-deprecating cognition which further impairs performance, and so on (see Figure 2). For some students, this is a frequent course of events, and anxiety becomes reliably associated with any situation involving the second language. Once established, this association leads students to become anxious at the prospect of second language learning or communication.

At the root of this model is a distinction be-

FIGURE 2  
Recursive relations among anxiety, cognition,  
and behaviour.



tween state and trait anxiety. On one hand, state anxiety is an immediate, transitory emotional experience with immediate cognitive effects. On the other hand, trait anxiety is a stable predisposition to become anxious in a wide range of situations (Spielberger, 1983). It should be emphasised that state anxiety is the reaction, and trait anxiety represents the tendency to react in an anxious manner. The negative effects of anxiety discussed above, such as cognitive interference, can only be associated with the immediate anxiety experience and therefore refer to state anxiety arousal.

The majority of language anxiety scales, like Horwitz et al.'s (1986) Foreign Language Classroom Anxiety Scale (FLCAS), are trait-based scales. The items on most language anxiety scales tend to focus on the anxiety experienced while speaking the second language (MacIntyre & Gardner, 1988, 1991c). These scales are most useful in identifying those individuals who have experienced state anxiety arousal in the past and in predicting those who will be most likely to experience state anxiety in the future. The available measures of language anxiety focus primarily on output or production of the second language (MacIntyre & Gardner, 1988, 1991c) and may be highlighting a general concern for one's public self-presentation (Carver & Scheier, 1986; Leary, 1990).

To make the theoretical foundation of language anxiety more complete, we must also allow for the possibility that anxiety influences second language activities, such as listening, learning, and comprehension. There is a potential role for anxiety in these processes because the anticipation of second language use in receiving information can provoke an anxiety re-

action. For example, anxious students may worry about misunderstanding linguistic structures or worry about inferring meaning from context because of the potential for embarrassing errors. In educational settings, Tobias (1986) has found that anxiety may impair the ability to take in information, process it, and to retrieve it when necessary.

In the literature on language anxiety, a few studies have been conducted that examine the effects of language anxiety before the production stage. MacIntyre and Gardner (1991b) found a significant negative correlation between language anxiety and the ability to repeat short strings of numbers and to recall vocabulary items. This demonstrates that anxiety can limit the use of both short-term and long-term memory. It is interesting, and relevant to Sparks and Ganschow's arguments (1991, 1993a, 1993b), that native language versions of the same tasks did not correlate with language anxiety.

A more extensive follow-up study (MacIntyre & Gardner, 1994b) found that anxiety impaired performance on a wide range of repetition, listening, comprehension, reading, and learning tasks. Horwitz et al. (1986) argued that researchers should examine the "subtle" effects of language anxiety. MacIntyre & Gardner (1994b) concluded that relatively small effects on specific language learning processes can accumulate and will eventually lead to clear differences between the more anxious and the more relaxed students.

In an experimental study, MacIntyre & Gardner (1994a) used a video camera to induce state anxiety during a computerised vocabulary learning task. Results showed that anxiety arousal was associated with performance deficits in the learning, recall, and functional use of the vocabulary items. When the effects of the video camera had dissipated and no longer lead to state anxiety arousal, performance improved relative to those who were experiencing more anxiety arousal. Based on these findings, we see that when state anxiety is provoked, performance on second language tasks suffers, but no performance deficits are observed when learners are not experiencing anxiety. Thus, active interference seems to arise from state anxiety, and that interference can occur at any stage of the learning process. This is relatively strong evidence that anxiety arousal can act as a causal agent in creating individual differences in second language learning.

These studies contradict the claim that language anxiety is a consequence, rather than a cause, of problems in language learning. Fur-

ther, this evidence suggests that the effects of anxiety are not limited to problems encountered during speaking but pervade the entire language learning process. Thus, the LCDH model advocated by Sparks and Ganschow (1991, 1993a, 1993b) is at the same time compatible with the anxiety literature and incompatible without it. The two explanations for individual differences in language achievement do not appear to be antithetical, in spite of the apparent claim to the contrary.

#### “LANGUAGE ANXIETY OR NATIVE LANGUAGE APTITUDE DIFFERENCES”

The title of this section is taken from the subtitle of Sparks and Ganschow's (1991) article describing the LCDH. The LCDH is based on work in the area of reading disabilities and the work on linguistic aptitude by Carroll (1981) and others. It suggests that individuals who experience difficulties in the efficient coding of linguistic stimuli in the native language, particularly phonemes, will have similar difficulties in second language acquisition. It is further suggested that “. . . the majority of poor FL learners are distinguished from good learners by phonological coding difficulties . . .” (Sparks & Ganschow, 1993b, p. 289).

Sparks and Ganschow (1991, 1993a, 1993b) propose the LCDH as an alternative to affective explanations for individual differences in second language learning. They have claimed repeatedly that affective variables, and anxiety in particular, are not likely to be the causes of such individual differences. Affective variables are considered mere side effects of having difficulties in coding the native language. “In our view, low motivation, poor attitude, or high levels of anxiety are, most likely, a manifestation of deficiencies in the efficient control of one's native language, though they are obviously correlated with difficulty in FL learning” (Sparks & Ganschow, 1991, p. 10).

The existence of a relation between affective variables and individual differences in language proficiency is not disputed by Sparks and Ganschow. What is up for debate are the bases on which Sparks and Ganschow (1991, 1993a, 1993b) criticised affective variables, the proposition that native language aptitude is an alternative to affective explanations and that affect is simply a “manifestation of aptitude.” Each of these issues will be addressed in the discussion below.

In their series of articles on the LCDH, Sparks

& Ganschow offered a number of criticisms of affective variables that require a response. For example, a recent article (1993b) attacked both affective variables and language learning strategies as explanations for individual differences in language achievement. Their criticism of language learning strategies was that the strategies extend into other domains of cognitive functioning and therefore imply general intellectual failings rather than specific language learning difficulties. First, it should be noted that some of the strategies studied by researchers (for example, Oxford, 1990) could apply to numerous learning domains, others are highly specific to language learning, and still others are specific to particular stages of language learning. Thus, the criticism of language learning strategy research is overgeneralised. Second, it is somewhat ironic that Sparks and Ganschow (1993b) themselves pointed out that it is not usually the case that poor language learners are having trouble in other areas (p. 291). This makes it seem more plausible that language students who are not using appropriate strategies have simply not transferred them to the language learning domain. In fact, the training in phonetic coding advocated by Sparks and Ganschow (1993b) might be considered strategy training.

As for affective variables, Sparks and Ganschow (1993b, p. 291) noted two criticisms, neither of which is convincing. The first criticism was that affective variables are typically measured using self-report questionnaires and that such methods generally have measurement problems. Again, Sparks and Ganschow (1993b) overgeneralise their criticism to all self-report measures, apparently because of problems with measures of learning styles and native language modality testing. In fact, highly reliable and valid measures of language-related affective variables are available; Gardner's (1985) Attitude/Motivation Test Battery and Horwitz et al.'s (1986) FLCAS are two examples. In any case, quarrels with self-report methodologies are essentially irrelevant to the present debate because Sparks and Ganschow (1991, 1993a, 1993b) argue that affective variables function as consequences, not causes, of individual differences. That line of argument leads to the conclusion that even perfectly reliable and valid measures of affective variables would still hold no explanatory power; a conclusion that was challenged by several studies cited above.

The second criticism, based on “speculations” by Crain (1989), is that affective variables are effectively “sealed off” during cognitive

processing. The above discussion of the cognitive effects of anxiety and the empirical results cited with it strongly challenge this notion. Beyond this, however, is the more insidious suggestion that affective variables are “unrelated to language” and that only variables specific to language learning can be used to explain problems. This was referred to as the “assumption of specificity,” but with it Sparks and Ganschow (1993b) seemed to be using “language” to refer to the purely linguistic aspects of language.

Their argument warrants two criticisms. First, measures like Gardner’s (1985) Attitude/Motivation Test Battery, Oxford’s (1990) Strategy Inventory for Language Learning (SILL), Horwitz et al.’s (1986) FLCAS, and similar measures are all specifically related to language learning experiences. They may not measure purely linguistic variables, but they certainly are language related. MacIntyre and Gardner (1989, 1991b) argued strongly that, in the case of language anxiety, the assessment of anxiety must specifically refer to that arising in language learning contexts in order to obtain consistent correlations between anxiety and language learning. Essentially, this is the assumption of specificity. Second, rather than posing a problem, the fact that affective variables are not measures of pure linguistic processing is a valuable asset. Affect represents a unique source of variance impinging on the system. To arbitrarily restrict potential explanations for individual differences in language learning achievement diminishes our potential to understand fully the process.

In an earlier paper, Sparks and Ganschow (1991) go to some length to criticise the work of Horwitz et al. (1986) and their FLCAS. Perhaps the key criticism is that Horwitz et al. may have overlooked native language deficits as the cause of both higher anxiety and lower proficiency. In this case, the argument would be that aptitude influences both proficiency and anxiety. This type of criticism is almost always valid for correlational studies, where a third variable might influence both of the variables in the correlation. In fact, similar criticism might be levelled against Sparks and Ganschow’s (1991) LCDH because it does not take into account the potential effects of affective variables when considering the relation between aptitude and achievement. One variant of this argument is that anxiety arousal could influence both scores on language aptitude and language achievement tests. Another possibility is that the arousal of social anxiety hampers coding of authentic

communication in either the native or second language, conceivably through the divided attention scenario described above.

All of these possibilities are consistent with the type of model shown in Figure 2. As noted above, these and similar variables are not involved in a strict linear process. Aptitude, cognition, anxiety, and language learning behaviours function in a recursive, cyclical pattern. Thus, aptitude can influence anxiety, anxiety can influence performance, and performance can influence anxiety. Sparks and Ganschow (1993a) also allowed for the possibility that students can be trained to increase their phonetic coding ability; thus aptitude also can be influenced. The interesting questions arising from this interplay have less to do with *whether* one variable affects the other and more to do with *when* do those effects occur? Sparks and Ganschow (1991) can be criticised for taking an “either/or” stand.

Additional criticism of Horwitz et al. (1986) was offered in an analysis of FLCAS items (Sparks & Ganschow, 1991). Unfortunately, that discussion obscured important differences among the items with respect to the source of the affective reaction. For example, the items, “feel overwhelmed by the number of rules required to speak language” and “afraid other students will laugh when I speak language,” appear to be addressing two very different sources of anxiety, one cognitive and the other social. Sparks and Ganschow (1991) classified both as “oral expressive.” It is granted that one or both items may be related to aptitude in some way, but other factors clearly are implicated. An anxious student may feel overwhelmed by the number of rules because their ability to process information is temporarily restricted by anxiety-related cognition. The fear of being laughed at by other students may occur for a number of reasons other than language coding deficits, such as poor group dynamics and competitiveness in the language classroom (Bailey, 1983; Clément, Dörnyei & Noels, 1994), both of which can be considered sources of social anxiety. Clearly, then, affect is more than a manifestation of aptitude (for a description of potential sources of anxiety in the language classroom, see Young, 1991).

This demonstrates a broader criticism of Sparks and Ganschow’s model (1991). Their theory focused exclusively on cognitive ability factors in terms of the coding of linguistic stimuli. They omitted consideration of social factors involved in language learning, such as classroom

interaction with teachers and other students, the degree of exposure to the language in the community, ethnolinguistic vitality, motivation, attitudes, intergroup relations, and contact with the target language community. Additional cognitive factors are neglected as well, such as the amount of effort invested in language study, the student's expectations for success, and perhaps most importantly, language learning strategies that might lessen the impact of native language deficits. In short, the linguistic coding deficit hypothesis neglects the context in which language learning occurs (Clément, 1980; Gardner & MacIntyre, 1992, 1993) and ignores the potential for social context to influence cognitive processes (Fiske & Taylor, 1991).

Sparks and Ganschow (1993a) provided such an example. In a series of case studies supporting the LCDH, the authors reported a case study of an unmotivated learner ("Amy") with high aptitude who was doing poorly in a Spanish course. They did not, however, explicitly integrate this type of possibility into their theoretical framework. Rather, they made a sweeping generalisation about unsuccessful foreign language learners with high aptitude having generally poor attitudes toward school, and dismissed the case as being unusual. Perhaps a student with high aptitude (like "Amy") may perform poorly if deliberate cognitive processes are preoccupied with self-presentation concerns or other anxiety-related cognitive activity, and therefore the automatic phonetic coding processes are not accessed. In cases such as these, phonetic coding impairment is not the best place to look for the cause of the language learning difficulty. This problem is likely to be one of affect (e.g., low motivation, poor attitude, high anxiety) impinging on the cognitive system.

It should be stressed that the argument here is not that the LCDH is incorrect. By definition, native language aptitude determines the parameters within which language learning will occur. It is reasonable to hypothesise that these limitations will extend to second languages as well. These links should be fully explored. The position advocated here is that the propensity to reach one's full potential as a language learner is partially determined by affective variables (Skehan, 1989), such as anxiety. For example, willingness to take a language course may be influenced by attitudes toward the second language group, persistence at study may be influenced by motivation, and the efficiency of learning may be influenced by anxiety. For stu-

dents to maximise their potential in the second language, they must have a positive contribution from the constellation of affective factors (Brown, 1991; Rubin & Thompson, 1982). The preceding discussion has demonstrated some of the ways in which the LCDH can be expanded to include affective variables.

## CONCLUSION AND IMPLICATIONS

As noted above, researchers have had some difficulty in demonstrating the role of anxiety in second language learning. Even with a number of empirical studies demonstrating a relation between anxiety and achievement, questions remain about the manner in which anxiety exerts an influence. In proposing their LCDH, Sparks and Ganschow (1991, 1993a, 1993b) have discounted anxiety and other affective variables as possible causes of individual differences in language achievement.

The response to the questions about the role of anxiety in second language learning, based on the study of the psychological effects of anxiety, may be stated as follows: language learning is a cognitive activity that relies on encoding, storage, and retrieval processes, and anxiety can interfere with each of these by creating a divided attention scenario for anxious students. Anxious students are focused on both the task at hand and their reactions to it. For example, when responding to a question in class, the anxious student is focused on answering the teacher's question and evaluating the social implications of the answer *while giving it*. To the extent that self-related cognition increases, task-related cognition is restricted, and performance suffers. Anxious students therefore will not learn as quickly as relaxed students. It is conceivable that with increased effort, anxious students could reach the same level of performance as relaxed students (see MacIntyre & Gardner, 1994a).

Considering the above discussion, it would appear that the effects of anxiety may be more complex than has been implied by Sparks and Ganschow (1991, 1993a, 1993b). If anxiety arises during learning then anxious students will perform poorly because they have learned less. However, if anything, anxiety may be more strongly aroused by speaking than by learning (MacIntyre & Gardner, 1994a, 1994b). Thus, anxiety may also interfere with the student's ability to demonstrate the amount that she or he does know. The classic example is the student who knows the material but "freezes up"

on a test. Anxious students are caught in this double bind; they have learned less and may not be able to demonstrate the information that they have learned. Further, the cyclical relation between anxiety and task performance suggests that as students experience more failure, their anxiety level may increase even more.

The LCDH advocated by Sparks and Ganschow (1991) does not recognise the language learning context. It is therefore incomplete. Given the extensive research on the ways in which the social context can influence cognitive processes in general (Fiske & Taylor, 1991) and language learning in particular (Clément, 1980; Gardner & MacIntyre, 1992, 1993; Skehan, 1989), this seems to be a significant omission.

One area in which both the cognitive interference model of anxiety and Sparks and Ganschow's (1991, 1993a, 1993b) linguistic coding deficit hypothesis converge is in the remedial action suggested to address language learning deficits. In both cases, it is suggested that attempts to reduce language anxiety may require some skills training as a supplement to anxiety reduction strategies in order to compensate for deficiencies created by anxiety arousal, native language problems, or both.

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Sparks and Ganschow respond in the next issue, 79, 2 (1995), of the *MLJ*.

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