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Challenging Assumptions  
Looking In, Looking Out

# The variability of foreign language anxiety over time in EFL classrooms

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This paper reports on a large scale survey-based study which asked Japanese university students (N=421) to reflect upon their level of foreign language anxiety from a cognitive perspective. These students reported their level of anxiety to understand, process, and produce English before and after completing a one-semester required English oral communication course. A comparison of the students' pre- and post-course levels revealed a number of significant differences that existed amongst the different types of anxiety. A follow-up course evaluation survey also provided insights into how the teacher's performance, the course materials and the activities done in the course relate to students' level of anxiety. Collectively, these findings illustrate the subtle effects of foreign language anxiety within a language classroom.

本論文は認知的枠組みから外国語に対する苦手意識について大学生421名を対象に大規模に行った聞き取り調査に基づく研究について報告する。調査対象の学生には英語オーラル・コミュニケーション必修科目の一学期終了前と終了後で英語の理解、処理、英語での発話に対して感じる苦手意識について述べてもらった。受講前と受講後で学生を比較してみると、様々な苦手意識に存在する相当な変化が見られた。当該コースの授業評価について追加アンケート調査を実施したところ、教師の教え方・能力、使用教材及び授業での演習がいかに学生の苦手意識と関連しているかを理解する上で手がかりとなった。総合的にこれらの結果から言語学習の授業における外国語への苦手意識の与える微妙な影響について説明できる。

In EFL learning situations, the classroom represents the primary opportunity for learners to use and develop their current level of English. This opportunity, however, may be diminished for some students whose input, processing and output capabilities are reduced from a heightened sense of anxiety. The potential detrimental effects of foreign language anxiety upon students' efforts to learn and use English become more acute considering the influence of output-driven and interactional approaches (e.g. Long, 1996;

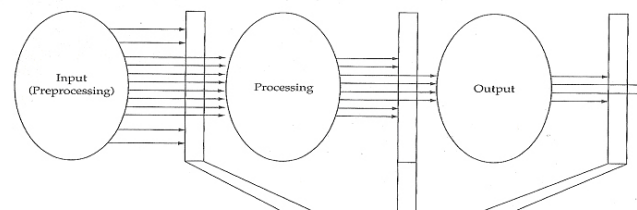
Swain & Lapkin, 1998) on EFL pedagogy. As such, it is important for researchers and teachers alike to gain a deeper understanding of the manner in which foreign language anxiety exists within EFL learning situations. This entails not only defining the characteristics of foreign language anxiety, but also identifying potential sources of anxiety within an EFL classroom as well as tracking the variability of anxiety in students over time. Developing a more comprehensive account of foreign language anxiety in turn will help provide teachers with insights on how to facilitate a language learning environment that reduces the negative impact of anxiety on students' attempts to learn and use a foreign language within a classroom.

Foreign language anxiety has been defined as a specialized type of anxiety that arouses negative emotional reactions such as fear or apprehension when learning or using a second language (Horwitz, Horwitz, & Cope, 1986; MacIntyre, 1999; MacIntyre & Gardner, 1989). One of the major lines of research within this area has focused upon the relationship between language anxiety and language production and achievement (Aida, 1994; Horwitz et al., 1986; MacIntyre & Gardner, 1994). The results of these studies have revealed significant negative correlations suggesting that anxiety can impede language learning. The negative relationship between language anxiety and language achievement, however, has been defined largely with global methods such as course grades or standardized proficiency tests. As a result, Horwitz et al. (1986) have recommend that research must also account for the more specific and subtle effects of anxiety on foreign language learning.

### *Foreign language anxiety from a cognitive perspective*

One area in which the subtle effects of foreign language anxiety may be involved is the cognitive processes that are ongoing in students as they learn and use a second language. For example, Eysenck (1979) postulated that anxiety may cause cognitive interference as the anxious person has his/her attention divided between task related cognition and self-related cognition thereby having detrimental effects on performance. The thrust of this argument is that a more complete account of foreign language anxiety should include the cognitive activities preceding the performance.

Following this line of reasoning, MacIntyre and Gardner (1989) investigated the potential interaction between anxiety and cognitive process. Drawing on the work of Tobias (1979), they conceptualized this interaction as one that could occur at a number of different cognitive stages before and during second language use (see Figure 1).



**Figure 1. A graphical representation of the interaction between anxiety and the different cognitive stages underlying second language learning and use**

The input stage is the learner's initial experience with the second language. At this stage, concentration, attention, and encoding are important cognitive processes. Anxiety, however, can inhibit these processes by acting as a filter and thus preventing information from entering the next stage, which is responsible for processing the input.

During the processing stage, cognitive operations such as organization, storage, and assimilation of information are of primary importance. Anxiety at this stage can, however, distract learners from adequately processing the information, which can in turn influence both the accuracy and speed of language learning.

Finally in the output stage, learners need to demonstrate their ability to use the target language. The introduction of anxiety at this cognitive stage may disrupt the retrieval of information of previously learned material thereby influencing the quality and the fluency of the learners' output.

In order to further clarify the relationship between anxiety and the different cognitive stages underlying second language learning and use, MacIntyre and Gardner (1994) devised an 18-item scale attempting to define the effects of anxiety at three cognitive stages (i.e. input, processing, and output). They found significant correlations between anxiety at the different cognitive stages and students' grades and scores. In addition, they were able to identify specific tasks that caused anxiety and different cognitive tasks that influenced students' ability, for example, to retain test items in their short term memory or to retrieve second language items from memory. From these findings, MacIntyre and Gardner concluded that researchers need to consider more than just the output stage because "the potential effects of language anxiety on cognitive processing in

the second language appear pervasive and may be quite subtle" (p. 301), and research that only focuses on output may neglect not only the effect of anxiety at previous cognitive stages, but also its effect on the links between the stages.

This study thus aims to closely examine students' level of anxiety at the different cognitive stages. An additional point of interest is the extent to which students' level of anxiety varies over time. The following research questions thus guide this investigation.

1. To what extent do the items on the MacIntyre and Gardner's anxiety scale differ in terms of the amount of anxiety they elicit from Japanese university students before and after completing a required oral English communication course?
2. To what extent is there a relationship between the anxiety students feel at different cognitive stages (i.e. input, processing, and output) and their evaluations of the required English communication course?

## Method

### *Participants*

This investigation involved 421 science students (i.e., 125 females and 296 males) attending a national university and a private university on the outskirts of Tokyo. These students took a required one-semester English oral communication course that met once a week for 90 minutes. The goal of the oral communication class is prepare students to travel to an English-speaking country.

## Materials

The students completed a Japanese version of MacIntyre and Gardner's anxiety scale in the first and the last class of the required English oral communication course. The survey asked students to indicate their level of:

*Input anxiety:* This 6-item scale focuses upon the apprehension students experience when they take in information in a second language (pre- $\alpha$ : .76; post- $\alpha$ : .77).

*Processing anxiety:* This 6-item scale focuses upon the apprehension students experience when they learn and think in a second language (pre- $\alpha$ : .76; post- $\alpha$ : .77).

*Output anxiety:* This 6-item scale focuses upon the apprehension students experience when they speak or write in a second language (pre- $\alpha$ : .73; post- $\alpha$ : .76).

On the last day of classes, the students also completed an evaluation of the required English oral communication course. The students were asked to evaluate:

*The course:* This 9-item scale asked students about their overall impression of the course ( $\alpha$ : .87).

*The course materials:* This 4-item scale asked learners to give their impression about the materials used in the course ( $\alpha$ : .77).

*The course activities:* This 6-item scale asked students to evaluate the types of activities that they performed in the course ( $\alpha$ : .85).

*Teacher performance:* This 7-item scale asked students to evaluate the teacher's performance ( $\alpha$ : .88).

*Teacher-Student Relationship:* This 3-item scale asked students to evaluate the relationship they had with the teacher of the course ( $\alpha$ : .73).

*Self-evaluation:* This 7-item scale asked students to evaluate their level of motivation and participation in the course ( $\alpha$ : .81).

The initial version of the anxiety scale and the course evaluation were written in English. Two Japanese EFL instructors then independently translated the questionnaires into Japanese. They then compared and combined their translations to ensure that the wording of the items and the scales sounded natural and appropriate. The questionnaires were then administered to a group of 20 university students from the target population. Their feedback resulted in a few word changes. The items on the anxiety survey and the course evaluation were then randomized on two different versions of the questionnaires to counterbalance any tiredness effect.

## Procedure

On the first day of classes, students were told about the general purpose of the study and asked to participate in the study on a voluntary basis. The students were also assured verbally and in writing that their responses on the questionnaires would be kept confidential and would not influence their course grade. The questionnaires on the first and the last day of classes were collected by a research

assistant, who put them in sealed envelopes that were opened once the students' course grades had been submitted to their respective universities.

### Analysis

The students' responses on the anxiety scale and on the course evaluation were analyzed using the Rasch Rating Scale model (Andrich, 1978) implemented by Winsteps (Linacre, 2007). This model provides two types of estimates. The first type of estimate is the students' level of anxiety before and after completing the required English oral communication course. The second type of estimate is the amount of anxiety that the different items on the MacIntyre and Gardner anxiety scale elicit from students before and after completing the required English oral communication course. These estimates are reported in units of measurement called logits, which are best thought as the probability of students being anxious in the different cognitive stages featured in the MacIntyre and Gardner anxiety scale.

Since this investigation aims to determine the subtle effects of foreign language anxiety in an EFL classroom, the anxiety estimates of the different items on the MacIntyre and Gardner anxiety scale were analyzed using a differential item functioning (DIF) analysis. Typically a DIF analysis is used extensively in assessment research to determine whether items on a test pose a measurable advantage or disadvantage for a particular group test takers (Reise, 1999). In the context of this study, DIF analysis can determine if the level of anxiety that the different items on the MacIntyre and Gardner anxiety scale is significantly different before and after the students complete the required English oral

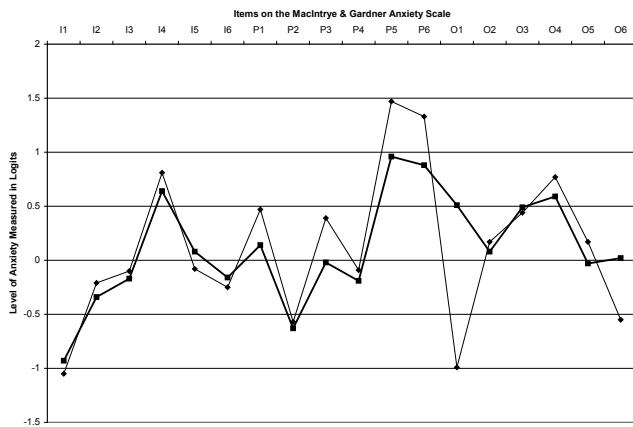
communication course. Since a DIF analysis relies upon the use of multiple t-tests, the Bonferroni adjustment was used to set the level of significance at 0.003 (Brown, 2001). This very conservative alpha level helps offset any Type I errors due to multiple comparisons from the same data set (Ryan, 1972).

### Results

#### *The subtle changes in foreign language anxiety*

Figure 2 shows the extent to which the anxiety level associated with the different items on MacIntyre and Gardner's anxiety scale varied before and after the students completed the required English oral communication course. The thin line with diamonds is the students' pre-course level of anxiety whereas the darker line with the squares is the students' post-course level of anxiety.

In terms of the input anxiety items (i.e. items I1 to I6), there is relatively no difference between pre- and post-course anxiety levels. In contrast, there are four processing items (i.e. items P1, P3, P5, and P6) that differ in the level of anxiety they elicited from students before and after the English oral communication course. Table 1 shows that these processing anxiety items elicited lower levels of anxiety after the students completed the required English oral communication course. In terms of output anxiety, there are two items (i.e. items O1 and O6) that elicited higher levels of anxiety from students. Item O1 "I never feel tense when I have to speak in English" saw the greatest pre-post course difference of -1.51 logits.



**Figure 2. Pre- and post-course levels of anxiety for the different items on the MacIntyre & Gardner anxiety scale**

*The relationship between students' level of input, processing, and output anxiety and their evaluation of the required EFL course*

Table 2 shows that there are a number of significant negative correlations between the different types of foreign language anxiety and their evaluation of the required English oral communication course. In terms of input anxiety, significant negative correlations existed with every aspect of the course evaluation with the exception of students' evaluation of their level of motivation and participation in the course. Students' evaluation of their teacher's performance produced the strongest negative correlation. In other words, students' who

**Table 1. Differential Item Functioning Analysis for the MacIntyre & Gardner Anxiety Scale**

Item		Pre-Course	Post-Course	Difference
P1	I am anxious with English because, no matter how hard I try I have trouble understanding it.	0.47	0.14	-0.33*
P3	I am self-confident in my ability to appreciate the meaning of English dialogue.	0.39	-0.02	-0.40*
P5	Learning new English vocabulary does not worry me; I can acquire it in no time.	1.47	0.96	-0.51*
P6	I don't worry when I hear new or unfamiliar words, I am confident that I can understand them.	1.33	0.88	-0.44*
O1	I feel confident that I can easily use the English vocabulary that I know in a conversation.	-0.99	0.51	1.51*
O6	I never feel tense when I have to speak in English.	-0.55	0.02	0.57*
*All differences significant at p < 0.003.				
Note items P3, P5, P6, O1, and O6 were reverse coded for the analyses.				

evaluated their teacher highly also reported lower levels of input anxiety. Likewise, students who evaluated their teacher poorly also reported higher levels of input anxiety.

In terms of students' level of processing anxiety, significant negative correlations were found across all aspects of the course evaluation. Although the students' evaluation of the teacher had the strongest negative

**Table 2. Correlation between the different types of anxiety and students' evaluation of their required English oral communication course**

Anxiety Type	Course Evaluation	Course Materials	Course Activities	Evaluation of Teacher	Teacher-Student Relationship	Student Self-Evaluation
Input Anxiety	-0.18	-0.14	-0.16	-0.23	-0.16	-0.09
Processing Anxiety	-0.34	-0.23	-0.28	-0.35	-0.28	-0.18
Output Anxiety	-0.12	0.00	0.00	-0.04	-0.07	0.02
Correlation is significant at the 0.05 level (2-tailed).						

correlation with their level of anxiety, all of the other aspects of the course evaluation had a stronger negative correlation with students' processing anxiety compared to their level of input anxiety.

Students' level of output anxiety had only one significant negative correlation, which was with their overall evaluation of the course. Compared with the other significant negative correlations, the relationship between output anxiety and the course evaluation was the weakest.

## Discussion

### *Variation of students' language anxiety over time*

This study's focus upon the different items comprising the MacIntyre and Gardner anxiety scale reveals some of the very subtle effects that anxiety can have upon the different cognitive stages which underlie second language learning and use. Students' level of input anxiety was relatively stable before and after completing the required English oral

communication course. After being upon the receptive end of the junior and senior high school English curriculum, students may have become accustomed to listening and/or reading in English. As a result, having to read and listen to English in the required oral communication at university may not have created a situation that would create significant changes in students' level of input anxiety.

This study, however, found some significant reductions in students' level of processing anxiety before and after the required English oral communication course. One source for these lower levels of processing anxiety is students' increased confidence that they can learn new vocabulary (i.e. items P5 and P6). This feeling of confidence is promising since vocabulary is one of the fundamental building blocks for further language development. Being more confident about new or unknown vocabulary may also explain students' enhanced confidence that they can understand the meaning of an English dialogue (i.e. item P3). The combined effect of these higher levels of confidence may have also contributed

to students' feelings that their efforts in class are rewarded with a greater understanding of English (i.e. item P1). Taken together, the decrease in students' level of processing anxiety suggests that the cognitive processes underlying language learning will be able to function more efficiently in the future.

The opportunity to use English in the required oral communication course led to some significant increases in the students' level of output anxiety. For example after completing the required English oral communication course, students felt more anxious about speaking in English (i.e. item O1). In addition, there was also a sharp increase in students' anxiety concerning the productive use of known vocabulary (i.e. item O6). The latter finding is quite interesting considering that students' processing anxiety of new or unknown words drop considerably. This contrast thus highlights how the effect of anxiety can vary considerably between the different cognitive stages.

Higher levels of output anxiety may also reflect the different expectations associated with secondary versus post-secondary English education in Japan. The English curriculum in high schools is heavily influenced by university entrance examinations (e.g. Kobayashi & Rinnert, 2002) The focus of the English curriculums at universities, however, shifts towards developing students' productive communicative competence, especially in oral communication courses. This shift also involves a role change for students from being consumers of English knowledge to producers of English inside the language classroom. As a result, the experience of having to use English for communicative purposes may heighten students' awareness of gaps in their L2 competence, which may in

turn increase their level of output anxiety.

The higher levels of output anxiety found in this study may thus be an inevitable component of output-orientated language instruction, which stresses the importance of language use. Support for the connection between pushed output and anxiety is evident in the higher levels of anxiety reported by French immersion students in Canada (MacIntyre, Baker, Clément, & Conrod, 2001) and a group of EFL learners, who completed a task-based curriculum in a Japanese university (Weaver, 2007).

### *The relationship between students' level of language anxiety and their experience within an EFL classroom*

The required English oral communication course is part of a larger social context that shapes students' perceptions about their ability to learn and use English as a foreign language. Yet, the results of this study highlight the important relationship that exists between language anxiety and learners' perceptions of what occurs within in the language classroom. Out of all the different aspects that students evaluated in their required English communication course, the performance of the teacher had the strongest relationship with students' level of input and processing anxiety. It is important to note that a causal relationship between teacher performance and language anxiety cannot be made since the findings of this study rely upon correlation analysis. Yet, this relationship does highlight a potential mediating role that language anxiety can play between students and their teacher. The presence or absence of input anxiety, for example, may influence students' ability to understand their teacher's instructions, which would have a significant impact



on the effectiveness of task-based instruction (e.g. Samuda, 2001). Likewise, processing anxiety may influence the way in which students incorporate their teacher's feedback in subsequent L2 performances, which is a central concern to researchers interested in focus on form instruction (Doughty & Williams, 1998) and the use of recasts to promote L2 development (Mackey et al., 2007). Thus, exploring the relationship between anxiety at the different cognitive stages and students' perceptions and behaviors within the language classroom is a fertile area for further empirical investigations, which would be greatly enhanced with the use of qualitative research techniques.

### Conclusion

The findings of this study begin to reveal some of the subtle effects that foreign language anxiety has upon the different cognitive stages underlying second language learning and use over time. One of most interesting findings arising from this study is that foreign language anxiety is a complex construct which has the potential of being very dynamic in the way it mediates students' perceived ability to comprehend, process, and produce English inside an EFL classroom. Although students in this investigation reported little change in their level of input anxiety, the variability found in their processing anxiety and output anxiety provide teachers with insights concerning the practical implications of foreign language anxiety within EFL classrooms. For example, students reported a significant drop in their level of anxiety to process new vocabulary. Yet, they also reported an increased level of anxiety when it came to producing known vocabulary. These seemingly contradictory findings highlight

the pedagogical importance of recognizing the different types of demands students face when they learn and use L2 vocabulary.

The strong relationship found between student evaluations of their teachers' performance and their level of input anxiety and processing anxiety also suggests that teachers can have a significant role mediating the impact of foreign language anxiety within their EFL classroom. Yet, to successfully do so requires a fine-grain understanding of the dynamic nature in which foreign language anxiety influences the different cognitive processes underlying L2 learning and performance. This investigation along with other recent reviews of foreign language anxiety (e.g. MacIntyre, 2007) will hopefully encourage more theoretical and empirical investigations in this important area of classroom-based research. Moreover, there is a need for a mixed method approach that brings together various quantitative and qualitative research techniques in order to further define some of the more subtle effects of anxiety on second language and use. This level of detail will be invaluable to educators who are seeking to create a learning environment that facilitates further second language development.

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