

“Listening Stress” and Its Debilitative Effects: Understanding the Circular Mechanism

「リスニングストレス」とその理解阻害効果の循環的メカニズム

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Abstract

The present study discusses the debilitative effects of “listening stress,” which has been conceptualized by the present author in a series of preliminary research projects in the psychological stress research framework to explain anxiety-related cognition in the second/foreign language (L2/FL) listening process. The effects of affective factors on L2/FL learning have been conventionally investigated with the construct of language anxiety. However, language anxiety is usually categorized as situation-specific anxiety, which is viewed as a rather stable attribute of individual learners, instead of state anxiety, which refers to actual experience of anxiety itself. Therefore, the real-time cognitive effects of language anxiety have neither been directly examined, nor have their debilitative mechanisms been explained adequately. By reviewing theorization of general anxiety and psychological stress, the present study identifies and delineates the circular mechanism of incremental stress and its debilitative effects as being unique to the L2/FL listening process. It also presents the stress-induction technique which the present author has developed and discusses its rationale, with a view to justifying and further elaborating the explication of the mechanisms.

Key words: listening, stress, anxiety, debilitative effect, circular mechanism

1. Introduction

As a learner variable presumably influencing second/foreign language (L2/FL) learning, anxiety has been much discussed and investigated in the past thirty years, affording more illuminating and diversified insights into L2/FL learning. Anxiety that L2/FL learners experience, or more widely known as language anxiety, has commonly been accepted as being a distinctive construct, separate from other more general types of anxiety, to be measured as such (e.g., Horwitz, Horwitz, & Cope, 1986; MacIntyre & Gardner 1991a, 1991b; MacIntyre, 1999). Although it is a useful concept and is often referred to in discussing the affective aspect of language learning classrooms, language anxiety has its own intrinsic problems as a psychological construct as well.

One of these concerns its conceptualization. Research into general anxiety has identified three different types: trait, state, and situation-specific anxiety. Trait anxiety is one's long-lasting disposition to be anxious, whereas state anxiety is usually considered to be the experience of anxiety itself in any anxiety-evoking situation and is naturally transient in nature. Situation-specific anxiety is somewhat similar to trait anxiety in that it is stable and peculiar to each individual, except that

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it is specific to certain situations or contexts like taking a test and making a speech. According to MacIntyre (1999), language anxiety is a situation-specific anxiety. He defines it as “the tendency to experience a state anxiety reaction during language learning and communication” (p. 37) and does not identify it as state anxiety itself. He emphasized that “state anxiety is essentially the same experience” (p. 28) in no matter what situation it is aroused. However, considering that state anxiety is the kind of anxiety that is experienced in each specific situation in real time, it is very unlikely that the nature and characteristics of state anxiety are free from outside influence and are the same across different situations.

Another problem, which is directly derived from this conceptualization issue, is that language anxiety has been mostly examined and addressed for identification of its source and its removal, and not for its real-time effects on language use and the resultant performance. Since language anxiety, as above, has been considered to act only as a trigger for state anxiety, not much attention has been paid to the character of emotions experienced in the L2/FL context as being unique to it. Thus, the conceptualization of language anxiety as being situation-specific does not have much to offer to the elucidation of the mechanisms of its interactive and dynamic involvement in L2/FL cognitive processing in each individual situation. If we are to understand how language anxiety affect the process of L2/FL learning and performance in real time, it should be the aspect of state rather than situation-specific anxiety that we should focus on. Eventually, it is very likely that integration of situation-specific and state anxiety will lead to a clearer picture of the affective domain of L2/FL learning and use.

With this perspective of integrating situation-specific and state anxiety, the present author introduced the construct of “listening stress” as replacing the traditional and more prevalent listening anxiety construct adopted in the L2/FL listening research paradigm, and attempted to explicate the psychological inhibition presumably resulting from psychological tenseness, irritation, frustration, and the like that L2/FL learners experience in the face of listening difficulties. A series of research projects (Noro, 2005a, 2005b, 2005c, 2006, 2007a, 2007b) have been conducted to reformulate understanding of the affective domain of the L2/FL listening process, yielding schematic models of the construct structure of listening stress and its cognitive appraisal process, the latter of which presumably plays the central role in its arousal, based on the psychological stress theory formulated by Lazarus and Folkman (1984).

The present study specifically addresses the debilitating effects of listening stress, aiming to delineate the “vicious circle” of listening stress and listening deterioration, that is, the circular mechanism of listening stress debilitating comprehension and the debilitated comprehension increasing stress in turn. In so doing, it reviews and discusses theorization of the relationships between anxiety and cognitive processing as well as psychological stress theories regarding arousal of stress and its cognitive effects. It also presents the stress-induction technique which the present author has developed, and discusses its rationale, with a view to justifying and further elaborating the explication of the mechanisms of listening stress in the L2/FL listening process.

2. Cognitive effects of language anxiety

Language anxiety research paradigm and cognitive effects of language anxiety

Among the shortcomings often pointed out with language anxiety research is the seemingly “conflicting” results regarding its facilitative versus debilitating effects on the L2/FL learning process. This proverbial problem would, of course, incur no contradiction if it is to be considered in terms of the motivational framework as Scovel (1978) explicated the dynamics of anxiety motivation and

foreign language learning. When we look into the real-time effects of anxiety-related variables on the L2/FL cognitive process, however, these are mostly debilitative. Reviewing past language anxiety research, MacIntyre (1999) argues that the early studies of language anxiety yielded highly consistent results showing a negative correlation between anxiety and language achievement. Thus, the problem should be understood as being less the “conflicting” research results per se than the research paradigms being adopted in a rather undiscerned manner, i.e., the attitudinal/motivational orientation paradigm versus the affective/cognitive factorial involvement one. The real problem lies in the fact that, as above, there has not been much empirical research on effects of anxiety-related variables in the L2/FL context.

MacIntyre (1999) discusses the debilitative effects of language anxiety in terms of academic, cognitive, social, and personal aspects, referring to past language anxiety research. Among these effects, those on academic, social, and personal aspects are long-term and motivational/attitudinal, while the cognitive effects are those which have real-time impact on the actual language use process. As for the cognitive effects, several experiments (MacIntyre & Gardner, 1991, 1994a, 1994b; Gardner, Day, & MacIntyre, 1992) have been conducted to examine the effects of language anxiety on cognitive processing, following the Tobias three-stage model of the effects of anxiety arousal on learning (Tobias, 1979). Cognitive processing in each of the three stages, i.e., input, processing, and output stages, was proved to be hindered by anxiety arousal. MacIntyre explicitly affirms that the cognitive effects of language anxiety are a consequence of state anxiety arousal.

It should be noted here that all these experiments conducted by MacIntyre and associates (MacIntyre & Gardner, 1991, 1994a, 1994b; Gardner, Day, & MacIntyre, 1992) were conducted on the premise that language anxiety is a form of situation-specific anxiety causing the same state anxiety across anxiety-evoking situations. This means that the very mechanisms of state anxiety affecting cognitive processing are the same as well. However, when we think about the uniqueness of observed effects of affective factors in the L2/FL context, it should be natural to assume the existence of certain affective/cognitive mechanisms specific to that context involved there. This prompted the present author to focus on psychological stress for better understanding of the debilitative effects of anxiety-related variables in the L2/FL context. MacIntyre and associates’ research work is discussed again below for analysis of the experimental designs and the nature of anxiety expected to be evoked in them.

Cognitive effects of general anxiety

Let us review some of the theories that have been advanced to account for the effects of general anxiety on cognitive processing and performance, which provide us with groundwork for reexamination of language anxiety. Among the most noteworthy are Sarason’s (1984, 1988) cognitive interference theory, Humphreys and Revelle’s (1984) information processing theory, and Eysenck’s (1992) information efficiency theory. Sarason (1984) argued that evaluative instructions disadvantage high test-anxious individuals when the task is relatively complex. Humphreys and Revelle (1984) contended that arousal affected by state anxiety, which is determined interactively by trait anxiety and by situational moderators, reduces short-term memory, affecting more complex tasks more adversely than easy ones, because the former requires more demands on short-term memory than the latter.

Reviewing Sarason’s (1984, 1988) theory and Humphreys and Revelle’s (1984) theory, Eysenck assumes a rather different theoretical position. According to Eysenck’s (1992) theory, performance effectiveness and processing efficiency are clearly distinguished; the former refers to “the quality of

task performance,” while the latter points to “the relationship between the effectiveness of performance and the effort or processing resources invested in performance” (p. 132). The theory postulates that anxiety will harm processing efficiency more than performance effectiveness. In the mechanisms of this degradation, cognitions like worry and self-concern are assumed to pre-empt some of the resources of the working memory, affecting task performance, followed by compensatory allocation of extra efforts to the task, and thus experiencing impairment of processing efficiency. Eysenck also argues that it is state rather than trait anxiety that determines the level of performance, though the effects of the two kinds of anxiety are less easy to distinguish at an empirical level, in spite of their clear conceptual distinction.

Sarason’s (1984) enunciation of the conceptual foundations of the adverse effects of anxiety on cognitive processing could be utilized in taking a systematic look at the research results reported in many different realms. Humphreys and Revelle’s (1984) theory is enlightening in that it elucidates the mechanism of trait and state anxiety interactively reducing short-term memory load to explain the relationships between task performance and the task complexity. Despite Eysenck’s (1984) criticism of their rather unsophisticated conceptualization of the construct of short-term memory and the concept of arousal as well as their lack of a control system to monitor and adjust cognitive performance, the theory still stands, especially with arousal incorporated into their model as a key component, which could offer new insight into reexamination of the language anxiety construct.

It is likely that the listening stress postulate advanced in the present study will benefit most from Eysenck’s theory. First and foremost, the idea of indivisible effects of trait and state anxiety is common to the approach taken by the present study to integrate situation-specific and state anxiety into listening stress. This will be more amenable to conceptualization with psychological stress. The distinction of performance effectiveness and processing efficiency with the working memory mediating the two is also congruent with the circular mechanism of incremental listening stress and its debilitating effects.

Before closing this section, let us review another study of anxiety and its cognitive effects by Hinton (1989), who examined how anxiety state affects verbal understanding. In his carefully designed experimentation, the subjects were divided into two groups: the stressed group, who were told that their names were recorded and that the test related to intelligence, and the relaxed group, who were treated very informally and were told that they were simply subject numbers. Three difficulty levels of sentences based on syntactic complexity were prepared for the subjects to read on a computer monitor and judge their meanings. The results showed significant negative correlations between anxiety state and accuracy of performance as syntactic complexity increased, with the most significant correlation found in the stressed group. Hinton employed the transactional stress model developed by Cox and MacKay (as cited in Hinton, 1989) to consider the psychophysiological assessment of anxiety, aiming to identify “feedforward” and “feedback” processes in its mechanisms. He developed a schematic model, admitted as speculative, where anxiety trait and anxiety state could be conceptualized as “both ‘feedforward’ and ‘feedback’ in the control of selective attention during the performance of mental tasks” (p. 199).

Although it was conducted as general anxiety research and not specifically in the L2/FL context, Hinton’s (1989) study is considered to suggest the relevance of discussing anxiety in the psychological stress framework. Also, despite the differences in modality (reading vs. listening) and language status (L1 vs. L2/FL), both Hinton’s study and the present research discuss the debilitating effects of psychological stress on verbal comprehension. The feedforward and feedback processes which Hinton identified could be interpreted to constitute part of the rationale that the idea of integrating situation-

specific and state anxiety into listening stress is based on. The same processes could also be regarded as evidence of the circular mechanism of listening stress and its effects. Both are discussed in detail below.

3. Cognitive effects of listening stress

Psychological stress research paradigm and cognitive effects of psychological stress

Psychological stress has been investigated for its effects on cognitive processing in much the same manner as anxiety. In fact, it has often been used as a synonym for anxiety. In Lazarus and Folkman's (1984) theorization, stress is used as a more comprehensive term to include negative emotions like frustration, anxiety, conflict, and the like. They define psychological stress as "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (p. 19). Their conceptualization of psychological stress comprises three stages: cognitive appraisal of the environment to judge whether it is stressful or not, coping processes through which the individual manages the stressful environment, and experience of stress responses. The significance of their conceptualization lies in their view of stress being "not a variable but a rubric consisting of many variables and processes" (pp. 11-12). This perspective is in line with the idea of integrating situation-specific anxiety and state anxiety into one unitary entity proposed by the present author. Thus, it is expected to better explain the affective/cognitive interactive and dynamic relationships in the L2/FL listening process, which seems to exhibit distinct characteristics that can be specifically identified with this integration.

Before further elaborating the incorporation of psychological stress into the L2/FL listening process and the debilitative effects which it presumably brings about, let us briefly review the more comprehensive consideration of the relationships between stress and cognitive processing offered by Mandler (1984), which seems to bear relevance to it. Through his in-depth examination of stress and emotions, Mandler explicates the short-term effects of stress on thought processes, arguing that the most important effect is its interference with "the smooth operation of conscious cogitations and cognitions" (p. 252). Mandler discusses the interference in terms of limited capacity of consciousness and autonomic arousal. According to his discussion, when autonomic arousal resulting from psychological interpretation or appraisal of a situation is perceived, the situation is defined as stressful. He argues that this autonomic activity may act as a "noise," because autonomic arousal, when consciously registered, takes up the conscious capacity that should have been directed to attending to the primary task engaged in by the individual and interferes with ongoing cognitive efficiency. Mandler considers cognitive efficiency in terms of the number of events, or "cues," that can be allocated conscious attention, which he hypothesizes will be limited with increasing autonomic activity in the presence of attention-demanding occurrences. He specifies that, when a task requires attention to a wide range of cues, cognitive efficiency will experience deterioration.

It is obvious that Mandler's (1984) theorization has a lot in common with those theories of the cognitive effects of anxiety introduced in the previous section, especially Eysenck's (1992) information efficiency theory. The concept of consciousness in Mandler's discussion corresponds to the working memory in Eysenck's, and the idea of efficiency rather than effectiveness being impaired by stress is almost identical to the central idea of Eysenck's theory. The significance of Mandler's formulation of stress and its cognitive effects is that the consciousness component is incorporated into it. The point above is that it is interpreted to mostly overlap the concept of working memory in terms of its role in information processing. Following Mandler's reasoning, however, we come to the conclusion that it is also conceptualized as playing a crucial part in the appraisal process of stress. That is, consciousness

must clearly be involved in perception of autonomic arousal which ensues from interpretation or appraisal of possible stressors. The consciousness component in Mandler's formulation, along with the overall theoretical rationale, is discussed in the next section for its adequacy for elucidating the circular mechanism of debilitating effects of psychological stress on the L2/FL listening process which the present study proposes.

Debilitative effects of listening stress

By introducing psychological stress into the language anxiety research paradigm, it is expected that the debilitating effects of anxiety-related variables on cognitive processing in the L2/FL context can be better and more deeply explicated. The listening stress construct which the present author proposes to introduce into the affective/cognitive mechanisms in the L2/FL listening process to replace the traditional and more prevalent listening anxiety construct is one such attempt. Conceptualization of listening stress has its basis on Lazarus and Folkman's (1984) stress theory mentioned above. Listening stress is operationally defined as "psychological inhibition debilitating listening comprehension which L2/FL learners experience in the face of listening tasks that they perceive to be too difficult" (Noro, 2005b, p. 138). Before examining and discussing the debilitating effects of listening stress and its mechanism, a quick overview of its construct structure and cognitive appraisal process formulated by the present author follows.

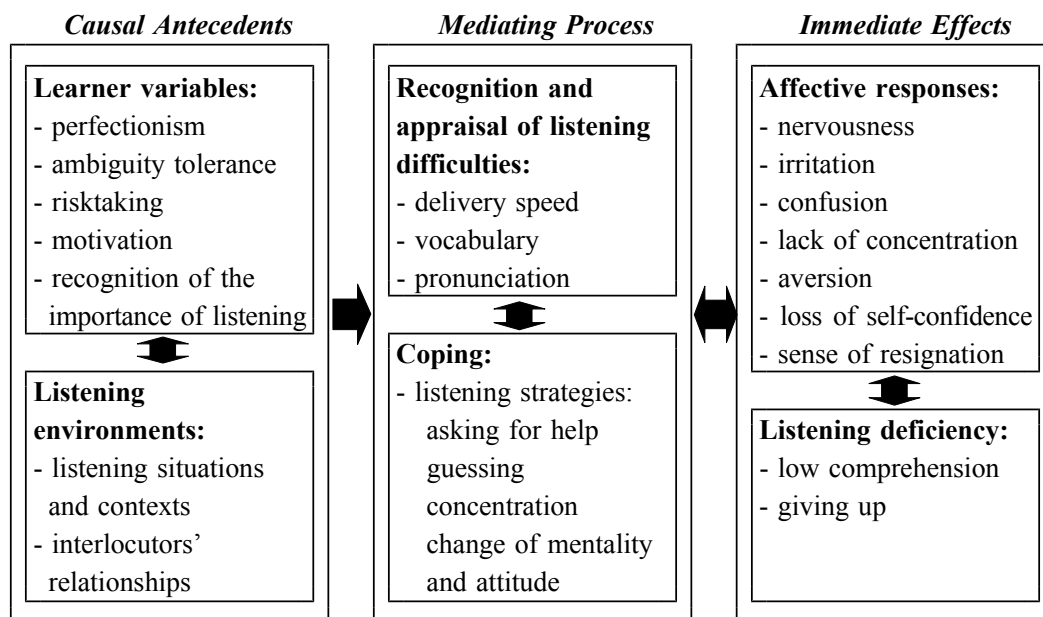


Figure 1. Construct model of listening stress (Noro, 2007a)

Figure 1 shows a preliminary schematic model of the listening stress construct (Noro, 2007a). The model, however, should be understood as more of a prototypical one, upon which further sophistication of the construct structure as well as its mechanisms is naturally expected to be attained. As shown in Figure 1, the overall structure of the construct is explained in three basic components, following Lazarus and Folkman's (1984) model. While the very experience of stress responses should be addressed and explicated in terms of state rather than situation-specific anxiety, the model represents the idea of integrating situation-specific anxiety and state anxiety into one unitary entity to explain the affective/cognitive mechanisms in the L2/FL listening process. This echoes the above-mentioned Eysenck's (1992) observation that it is state rather than trait anxiety that determines the level of

performance though the effects of trait anxiety and state anxiety are difficult to distinguish at an empirical level. The feedforward and feedback processes in Hinton’s (1989) argument of anxiety will account for the interactive nature of situation-specific and state anxiety possibly encompassed by listening stress.

Unlike the language anxiety construct, which does not postulate any specific mechanisms of cognitive effects, this conceptualization of listening stress is expected to explain the cognitive effects and mechanisms unique to the L2/FL context.

Circular mechanism of incremental listening stress and its debilitative effects

The most obviously unique characteristic of the cognitive effects of listening stress is the vicious circle of incremental listening stress and its debilitative effects. That is, listening difficulties cause listening stress, which hinders successful coping or use of listening strategies, further increasing difficulties and stress. This is also characterized by the feedforward and feedback processes represented in Hinton’s (1989) model. The key components of this circular mechanism should naturally be the mediating process and immediate effects. In light of the concerted understanding that arousal of stress depends on cognitive appraisal of possible stressors, the components of the mediating process and immediate effects in the listening stress construct model were further elaborated through qualitative as well as quantitative analysis of questionnaire and interview data and yielded another schematic model focusing on the cognitive appraisal process as shown in Figure 2 (Noro, 2007b).

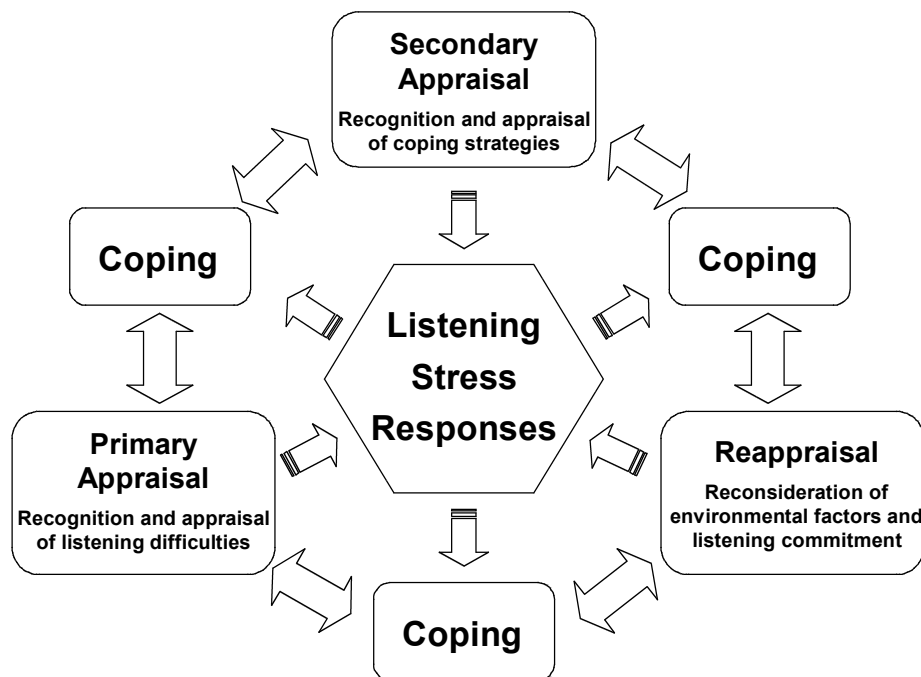


Figure 2. Schematic model of the cognitive appraisal process of listening stress (Noro, 2007b)

The model is designed to show the three stages of appraisal proposed by Lazarus and Folkman’s (1984) stress theory interacting with each other through mediation of the coping processes. The circular mechanism of incremental listening stress and its debilitative effects can be explained as follows; the three cognitive appraisals arouse listening stress responses, which in turn affect the coping processes that mediate the appraisal, while further stress responses, most likely severer ones, will also be aroused. The model gives the coping component a significant role to play in this mechanism. Unlike

the general psychological stress model, which has the coping component extraposed outside the appraisal stages, this listening stress model includes the component embedded between the appraisal stages, which enables it to represent the circular nature of listening stress and its debilitating effects. It is self-evident that once the listener falls into this circle, it is rather difficult to escape from it.

This circular model of listening stress can also be explained in terms of Eysenck's (1992) theory. His distinction of performance effectiveness and processing efficiency, with the working memory mediating the two, can be interpreted to have relevance to the appraisal and coping components respectively. That is, appraisal of poor listening comprehension performance leads to arousal of listening stress, which harms the efficiency of coping, causing further poor performance to be negatively appraised. Again, the coping component proves crucial in the mechanism in that it exerts more adverse effects on appraisal as its efficiency is reduced, creating the vicious circle.

Mandler's (1984) formulation of stress directly pertains to the present author's conceptualization of listening stress and its cognitive effects as well. Looking at the mechanism in Mandler's terms, the autonomic arousal resulting from cognitive appraisal, which Mandler refers to as "noise," can be imagined to be exerting far more adverse effects on L2/FL listeners' comprehension, considering the time-constrained cognitive processing required for listening comprehension and their limited linguistic competence. They inevitably use their "consciousness" in listening, which takes up the capacity that should have been used for comprehension and deteriorates listening efficiency, leading to severer autonomic arousal, or louder "noises."

As for the role of consciousness in L2/FL learning, Krashen (e.g., Krashen, 1982) proposed the popular but controversial view that conscious learning only work for monitoring L2/FL use and does not lead to its acquisition. It might be possible to interpret the role of consciousness by incorporating Krashen's idea into the framework of Mandler's (1984) stress theory. If too much monitoring occurs in L2/FL learning and use, in which intensely focused attention is required, it will naturally use up the limited capacity of working memory and will not leave any potential to cope with possible stressors. The influence of these stressors then may increase and be eventually appraised to be harmful to the degree that autonomic arousal is perceived, which in turn will again take up the consciousness capacity, eventually deteriorating the cognitive efficiency necessary for more naturalistic language acquisition. The circular mechanism is observed here as well. Obviously, this is speculation, but it is worth serious consideration and empirical examination.

Measurement of listening stress

With a view to elucidating the cognitive effects of language anxiety with empirical evidence, MacIntyre and Gardner (1994a) attempted to measure language anxiety and its effects quantitatively with video camera recording as an anxiety-inducing stimulus. They introduced a video camera at various points in a L2 (French) vocabulary learning task and measured the levels of anxiety aroused and vocabulary acquisition. They found significant increases in state anxiety and accompanying deficits in vocabulary acquisition at the time of video camera introduction. The results reported are convincing in showing the relationships between state anxiety and cognitive processing. However, it cannot be denied that the laboratory nature of the experimental research design ultimately reduces the psychological reality of the interpretations and implications given to the research results. More importantly, the effects of language anxiety on cognitive processing unique to the L2/FL learning context do not seem to have been extracted by their experimental design as they are actually experienced by L2/FL learners. Of course, this is in accord with their premise that state anxiety itself is the same, regardless of anxiety-evoking situations, and may not pose any problem to them. However,

as discussed above, if we are to elucidate the mechanisms of anxiety-related cognition in the L2/FL context, it will be essential that we contextualize the anxiety induction in a manner similar to L2/FL cognitive processing so that we will be able to attain validity and reliability in our research.

One possible problem with MacIntyre and Gardner's (1994a) experimental design is the use of video camera recording as an anxiety-inducing stimulus. Introduction of a video camera in a vocabulary learning task succeeded in arousing anxiety among the subjects, but the state anxiety that they experience obviously has nothing to do with their vocabulary learning *per se*, thus disappearing once the stimulus was removed and exerting no lasting effects that would be brought about by the kind of anxiety aroused through appraisal of the task in question. In other words, a more task-relevant technique is needed to induce task-specific anxiety.

As part of the reexamination of language anxiety in the L2/FL listening process, the present author (Noro, 2008) developed a stress-induction technique, with the factor of task difficulty incorporated into it and designed to function as the dominant stressor. Directions given to the subjects are also conceived to be important stress-evoking stimuli. The technique devised by the present author makes use of three different listening passages (Passages A, B, and C) with comprehension questions for each passage. The subjects are asked to listen to the passages and answer the comprehension questions for each passage in the order of A, B, and C. Passages A and C are supposedly of the same difficulty level and fairly easy passages to understand, while Passage B is of an advanced level and much longer and more difficult than the other two passages. Passage B is expected to arouse listening stress, together with three stress-evoking directions: 1) asking the subjects to give oral report of what they hear, 2) encouraging them to show their best listening performance, and 3) announcing evaluative feedback about their listening abilities to be given, all of which had been proved to be effective for induction of listening stress in the earlier research (Noro, 2007b). Passage C was prepared to measure the possible debilitative effects of listening stress on its comprehension in comparison with the comprehension level of Passage A, which was to be marked as the baseline.

A small-scale pilot study with this technique conducted by the present author (Noro, 2008) succeeded in bringing about drastic debilitative effects of listening stress, indicating possibilities of this technique. The reflective questionnaire that accompanied this technique revealed the effects to be of the kind unique to L2/FL listening, that is, of the circular nature of incremental stress and accompanying comprehension deterioration. It would seem a logical conclusion that the effectiveness of this stress-induction technique, which has been proved by these psychologically real debilitative effects, shows the validity of the listening stress construct and the way it is conceptualized in the present study, as well as possibilities of explaining anxiety-related cognition in the L2/FL context with it.

4. Conclusion

The present study reexamined language anxiety, reviewing theories of the effects of anxiety on cognitive processing, and attempted to reformulate the affective/cognitive mechanisms in the L2/FL listening context. It proposed to integrate situation-specific and state anxiety into listening stress and examined the circular mechanism of listening stress and its debilitative effects as being unique to the L2/FL listening process. As discussed above, the cognitive effects of language anxiety conceptualized as situation-specific anxiety had not been fully explicated, partly due to lack of empirical evidence, but mostly because theorization of the relationships between situation-specific and state anxiety has not been fully accomplished, especially with the cognitive effects of state anxiety unique to the L2/FL context. The circular model of the debilitative effects of listening stress proposed in the present study

can be regarded as characterizing the L2/FL affective/cognitive mechanisms. In this respect, the construct of listening stress might be expected to lead to the development of an entire language stress theory in the L2/FL context.

Affective factors in L2/FL listening classrooms cannot be said to be attended to adequately, except by what may be labeled an “expectant treatment” approach, which attempts to address any problems in response to superficial symptoms. In order to advance essential coping with the true mechanisms of these affective factors and develop practical strategies against their debilitating effects, an informed approach is essential. For that purpose, further investigation, both theoretical and empirical, of the affective/cognitive mechanisms will be needed.

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