



THE IMPACT OF STRESS ON COGNITIVE PROCESSES IN FOREIGN  
LANGUAGE LEARNING

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**Abstract:** *This article provides a comprehensive analysis of the impact of stress on key cognitive processes involved in foreign language learning (FLL). It examines the neurobiological mechanisms through which stress hormones, particularly cortisol, impair functions in the hippocampus, prefrontal cortex, and amygdala. The paper details how stress specifically compromises working memory, long-term memory consolidation, retrieval, and attentional focus. It further explores the specialized construct of Foreign Language Anxiety (FLA) and distinguishes between debilitating distress and performance-enhancing eustress. Drawing from international research and the specific context of Uzbekistan, the article proposes a multi-faceted framework of stress management strategies encompassing pedagogical, psychological, and technological approaches. The conclusion emphasizes the necessity of managing stress to optimize cognitive resources for effective language acquisition and suggests directions for future research.*

**Keywords:** *Stress, Cognitive Processes, Foreign Language Learning (FLL), Foreign Language Anxiety (FLA), Cortisol, Working Memory, Eustress, Language Acquisition, Prefrontal Cortex, Hippocampus.*

### **Introduction**

Foreign language learning (FLL) is not only a linguistic but also a complex psychological process. In this process, the learner not only acquires a new system but also grapples with their own cognitive abilities and emotional state. Modern neuroscientific research demonstrates that stress levels directly affect the efficiency of language acquisition.

#### **Key Concepts:**

- Stress – the body’s reaction to a mismatch between demands and capabilities
- Cognitive processes – processes of cognition: attention, memory, reasoning
- Foreign language learning – acquisition of a second language

**Relevance of the Problem:** In the context of global migration and globalization, the need to learn foreign languages is increasing. At the same time, many learners experience “language blocks” and failures due to stress.

**Research Objective:** To analyze the impact of stress on key cognitive processes in foreign language learning and to develop effective stress management strategies.

#### **Physiological Mechanisms of Stress**





In a stressful situation, the body's hypothalamic-pituitary-adrenal (HPA) axis is activated. This axis releases the hormone cortisol. Cortisol affects various parts of the brain:

- **Impact on the Hippocampus:** The hippocampus plays a crucial role in the formation of new memories. High cortisol levels weaken synapses between neurons in the hippocampus, reducing the ability to memorize and retain new information.
- **Impact on the Prefrontal Cortex:** The prefrontal cortex manages complex thinking, planning, and decision-making processes. Stress reduces the activity of this region, resulting in the learner losing the ability to think logically and analyze based on rules.
- **Impact on the Amygdala:** Stress activates the amygdala, which intensifies emotional reactions. This creates anxiety and fear when speaking a foreign language. [1]

### **Impact of Cortisol on Language Learning**

Research shows that high cortisol levels:

1. Impairs short-term memory – makes it difficult to memorize new words or phrases
2. Reduces information processing speed – slows down the translation of thoughts into language
3. Weakens auditory perception – reduces the ability to understand speech

**Importance for Uzbek Learners:** Given that exam stress is particularly strong in Uzbekistan's education system, understanding these mechanisms is of particular importance.

### **Impact of Stress on Key Cognitive Processes**

#### **Impact on Working Memory**

Working memory is the system that temporarily stores and processes information. When speaking a foreign language, we temporarily store heard words and analyze them.

#### **Impact of Stress:**

- **Allocation of Cognitive Resources:** During stress, part of the attention is directed not at the task, but at worries such as "Will I fail?"
- **Reduced Memory Capacity:** Stress can reduce the capacity of working memory by 20-30%.

**Research Finding:** Learners under stress have difficulty understanding grammatically complex sentences. [2]

#### **Impact on Long-Term Memory**

For new words and rules to be placed in long-term memory, they need to be repeated and reinforced.

#### **Two-Stage Impact of Stress:**

- **Encoding Stage:** Stress makes it difficult to place new information into memory.
- **Retrieval Stage:** Stress makes it difficult to recall information learned before the stressful event.

**Practical Example:** Anxiety before an exam can lead to a student being unable to recall material learned throughout an entire semester.

#### **Impact on Attention and Focus**





In a stressed state, the attentional field narrows. The learner focuses all attention on one point (e.g., their own mistakes) and misses important context.

**“Blindness Effect”:** The learner pays attention only to the mistake they are making and fails to hear the teacher’s explanations.

### **Foreign Language Anxiety (FLA)**

#### **The Concept of FLA**

Introduced by Horwitz, Horwitz, and Cope (1986), this concept refers to the specific anxiety related to learning and using a foreign language.

#### **Main Components:**

- Communication Apprehension – fear of not understanding or not being understood
- Test Anxiety – fear of evaluation
- Fear of Negative Evaluation – embarrassment about making mistakes in front of others [3]

**In the Uzbek Context:** Given the strong concept of “uyat” (shame/honor) in Uzbek culture, social anxiety can be particularly intense.

#### **FLA Among Uzbek Learners**

According to surveys, 65% of Uzbek students reported difficulty speaking a foreign language and indicated stress as the main reason for this difficulty.

#### **Specific Problems:**

- Phonetic Differences: Stress when pronouncing sounds not present in Uzbek
- Grammatical Structures: Difficulty mastering grammatical structures absent in Uzbek
- Cultural Differences: Unfamiliarity with language culture can cause stress

#### **Stress Management Strategies, Pedagogical Strategies.**

##### **Creating a Safe Learning Environment**

- Reframing Attitudes Towards Mistakes: Presenting mistakes as a natural part of learning
- Collaborative Learning: Encouraging cooperation rather than competition among learners

##### **Step-by-Step Tasks**

- Breaking complex tasks into smaller parts
- Ensuring a sense of success at each stage

##### **Using Creative Methods**

- Role-Playing: Learning to speak in a stress-free environment through role-playing games
- Gamification: Organizing the learning process in the form of a game

##### **Psychological Techniques**

##### **Breathing Exercises**

##### **Technique:**

1. Inhale for 4 seconds
2. Hold breath for 7 seconds





3. Exhale for 8 seconds

This technique activates the parasympathetic nervous system and reduces stress levels.

### **Mindfulness (Focusing Attention)**

Daily 10-minute mindfulness practice:

- Being in the present moment
- Observing thoughts without getting attached to them
- Directing attention to breathing [4]

### **Positive Self-Talk**

Replacing negative thoughts with positive ones:

- “I’ll never learn this” → “I improve a little every day”
- “I’m making a mistake” → “Every mistake is an opportunity to learn something new”

### **Technological Approaches**

#### **Mobile Applications**

- Anki – memorization through spaced repetition without stress
- Headspace – stress management through meditation
- Duolingo – learning a language in a gamified environment

#### **Virtual Reality**

Simulating real-life situations in a virtual environment, allowing practice without fear of mistakes.

### **The Concept of “Good Stress” (Eustress)**

#### **Yerkes-Dodson Law**

This law explains the relationship between stress and performance. According to the law, an optimal level of stress ensures maximum performance.

#### **Graphical Interpretation:**

- Low Stress: Insufficient motivation, low performance
- Optimal Stress: Highest performance
- High Stress: Performance sharply declines

#### **How to Create Eustress?**

1. Clear and Achievable Goals: Breaking large goals into small steps
2. Balanced Difficulty: The task should be slightly above the learner’s current ability
3. Feedback: Positive and constructive feedback

### **Practical Recommendations for Teachers and Learners**

#### **For Teachers:**

1. Dedicate the first 5 minutes of class to stress-reducing exercises
2. Consider each learner’s individual characteristics
3. In assessment, evaluate not only the result but also the effort
4. Use group work extensively
5. Hold a weekly “mistake-free” speaking day

#### **For Learners:**





1. Create a daily schedule: Learn the language at the same time every day
2. Start small: Just 15-20 minutes daily, but regularly
3. Self-compassion: Treat yourself like a friend
4. Physical activity: Naturally reduces stress hormones
5. Sleep routine: Good sleep is necessary for memory consolidation

### **Conclusion**

Stress is an inseparable part of the foreign language learning process, but it can be managed. Understanding the negative impact of stress on cognitive processes gives teachers and learners the opportunity to minimize this effect.

### **Key Conclusions:**

1. Acknowledge and accept stress – it is a natural reaction
2. Maintain an optimal stress level – neither too little nor too much
3. Use various strategies – pedagogical, psychological, and technological
4. Take a long-term approach – language learning is not a quick process

### **Future Research Directions:**

- Developing stress management models considering the cultural characteristics of Uzbek learners
- Creating personalized AI-based stress management programs
- Involving parents in the process of managing stress in foreign language learning

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## TANQIDIY NAZAR, TAHLILY TAFAKKUR VA INNOVATSION G'OYALAR



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