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The Effectiveness of Cognitive-Behavioural Therapy Training on the Verbal Intelligence of Students Participating in English Language Learning Classes

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A B S T R A C T

Purpose: The purpose of this study was to evaluate the effectiveness of cognitive-behavioral therapy (CBT) training on the verbal intelligence of students participating in English language learning classes.

Methodology: The study utilized a quasi-experimental design with a pre-test and post-test control group. Three schools were randomly selected from all public secondary schools in District 2 of Shiraz city, and two first-grade classes were chosen from each school. A total of 30 students with the lowest pre-test scores on the verbal intelligence instrument were selected and randomly assigned to either the experimental group (n=15), which received CBT training, or the control group (n=15), which did not receive any training. The CBT training consisted of 12 sessions over six weeks. The verbal intelligence questionnaire, with 25 questions across four sub-variables, was used to measure outcomes. Data were analyzed using multivariate covariance analysis and independent t-tests.

Findings: The results showed no significant differences between the experimental and control groups in the pre-test. However, post-test scores revealed that the experimental group had significantly higher scores across all verbal intelligence variables and sub-variables compared to the control group. The multivariate covariance analysis confirmed the assumptions of normality, homogeneity of variance-covariance matrix, correlation between dependent variables, and homogeneity of regression slopes. The effect size was 0.33, indicating that CBT training explained 33% of the variance in verbal intelligence post-test scores.

Conclusion: The study concluded that cognitive-behavioral therapy training significantly enhances verbal intelligence in students participating in English language learning classes.

Keywords: *cognitive-behavioural therapy training, verbal intelligence, English language learning*

1. Introduction

Intelligence refers to the ability to understand oneself and to be aware of one's inner states. This type of intelligence involves introspective and self-reflective activities. Individuals strong in this intelligence are usually introverted and prefer solitary work. They often possess high self-awareness and the ability to understand their feelings, emotions, goals, and motivations. Such individuals are typically interested in thought-oriented studies and research, such as philosophy. When allowed to focus on their subject, they tend to learn more effectively (Baramake et al., 2024; Nejadi, 2022; Roghani & Afrokhte, 2023; Seadatee Shamir, 2024; Tahmasebiboldaji, 2022; Yazdani et al., 2023).

Self-awareness includes recognizing one's strengths and weaknesses, understanding and examining oneself, being aware of inner feelings, desires, and dreams, evaluating thought patterns, reasoning, and understanding one's role in relationships with others. Individuals with high self-awareness often pursue careers as philosophers, psychologists, researchers, theorists, theologians, or writers (Mohkamkar et al., 2024; Roghani et al., 2022). This form of intelligence pertains to the ability to use words and language effectively (Gooran Savadkohi et al., 2023). Verbal intelligence encompasses skills such as working with words and expressions, speaking, and writing. Those strong in verbal intelligence exhibit advanced listening skills and are usually excellent speakers. For example, these individuals excel in reading, writing, storytelling, and memorizing words and terms. They learn more efficiently through reading, writing, note-taking, listening to lectures, and engaging in discussions. Additionally, they can easily learn other languages and have relatively good verbal memory. Their skills include listening, speaking, storytelling, explaining, teaching, using humor, understanding word forms and meanings, recalling information, and analyzing and using language. Careers suited for individuals with high verbal intelligence include politician, writer, philosopher, lawyer, teacher, translator, and journalist (Gardner, 2006).

Another form of intelligence deals with nature and relating information to one's natural environment. This intelligence, the eighth proposed by Gardner (1996), is characterized by a high sensitivity to nature and the surrounding environment. Individuals with strong naturalistic intelligence exhibit abilities such as growing and cultivating various animal and plant species, caring for and domesticating animals, detecting weather changes, and classifying different environments. They learn better when the subject involves gathering and analyzing information from nature. Such learners benefit from studying materials outside the classroom, preferably in natural settings (Boyle et al., 2021; Park et al., 2015).

Verbal intelligence is associated with effective language use, commonly found in journalists, poets, and lawyers. People with high verbal intelligence use spoken words effectively to discuss, settle, entertain, or guide, showing great sensitivity to the sounds or phonetics of the language (Boyle et al., 2021; Puig, 2013). They enjoy playing with words, using difficult-to-pronounce words, and employing sounds to motivate. They can discern meanings from text and construct well-phrased sentences. Linguistic intelligence may be the most universal form in the theory of multiple intelligences (Girard et al., 2023; Watts et al., 2016). Linguistic thinkers are skilled in creating language structure or syntax and can write beautifully constructed texts. They are sensitive to language's deeper meanings and can discuss each word in detail. The ability to use language for practical goals is crucial in linguistic intelligence, enhancing life significantly by focusing on meaning (Djuwantono, 2023; Fry, 1984).

In essence, verbal intelligence involves the correct use of words, either orally (e.g., by storytellers, orators, or politicians) or in writing (e.g., by poets, playwrights, editors, or journalists). This intelligence includes the ability to use syntax, phonology, semantics, and practical aspects of language skillfully. Uses of verbal intelligence include persuasion, mnemonics, explanations, and metalanguage (Boyle et al., 2021).

Cultural factors significantly influence the development of verbal intelligence. Activities such as reading aloud, storytelling, attending lectures and public discussions, and orally explaining lessons at school enhance language intelligence. Conversely, passive activities like watching TV as an information source can diminish this intelligence. Individuals with high linguistic intelligence often document their thoughts through note-taking, which can be done using various methods (Om, 2019; TÜRkoĞLu, 2022).

Cognitive-behavioral therapy (CBT) integrates the strengths of behavioral and cognitive therapy approaches, combining objectivity, evaluation, and measurement with the involvement of memory in reconstructing and interpreting information. This approach encompasses various theories and attitudes (Westen, 2000). Many problems stem from unrealistic expectations originating from irrational beliefs, thoughts, and distorted perceptions (Enayati Shabkolai et al., 2023; Pourjaberi et al., 2023;

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Rajaeinia, 2022). For instance, unreasonable expectations such as assuming people should guess each other's needs and moods can lead to relationship issues. Thus, addressing unrealistic beliefs and expectations through cognitive restructuring methods is essential. The cognitive-behavioral approach helps individuals behave more rationally, fulfilling their needs and enhancing their capabilities. Cognitive restructuring involves techniques that teach individuals to examine and adjust their assumptions about situations and the world, fostering more realistic and wise perspectives (Rajaeinia, 2022).

This research investigates whether CBT training can effectively increase interpersonal intelligence and verbal intelligence among students participating in second English language learning classes.

2. Methods and Materials

2.1. *Study Design and Participants*

In this research, three schools were randomly selected from all public secondary schools in District 2 of Shiraz city. Subsequently, two first-grade classes were chosen from each selected school. Research questionnaires were distributed to all volunteers in each high school. From the candidates who correctly completed the questionnaires, 30 individuals with the lowest pre-test scores on the verbal intelligence instrument were randomly selected. These participants were divided into two groups: 15 in the experimental group, who received cognitive-behavioural skills training, and 15 in the control group, who did not receive any training. After the interventions, a post-test was conducted, followed by a second post-test one month later as a follow-up. Participants were randomly assigned to groups. It was emphasized to the training groups not to share course content with students from other groups to prevent indirect transfer of training to the control group.

The study population comprised all students who participated in English language classes in Shiraz city during the 2021-2022 academic year, totalling 3000 students according to the Department of Education, Region 2. The sampling method employed was staged cluster sampling. First, three schools were selected from all public boys' schools in Shiraz city. Then, two classes were chosen from each first-grade cohort, and all volunteers in these classes participated in the study. The sample size was determined based on previous research, ensuring the experimental group received the necessary training.

2.2. *Measures*

2.2.1. *Verbal Intelligence*

The verbal intelligence questionnaire aimed to measure verbal intelligence among secondary school students. This questionnaire consisted of 25 questions across four sub-variables: verbal fluency, verbal quality, verbal management, and verbal coherence. It used a Likert scale ranging from 0 (not at all) to 4 (very much), with scores ranging from 0 to 100. The cutoff score was 50. The reliability coefficient was 0.80 using Guttman's split-half method and 0.85 using Cronbach's alpha.

2.3. *Intervention*

2.3.1. *Cognitive-Behavioral Skills Training*

The cognitive-behavioral skills training package combined cognitive therapy and cognitive psychology approaches. This approach integrates the strengths of behavioral and cognitive therapies, such as objectivity, evaluation, and measurement, while also considering the role of memory in reconstructing and interpreting information (Houghton et al., 2012). Cognitive-behavioral skills training was delivered in 12 sessions, each 90 minutes long, over six weeks (two sessions per week) for the experimental group.

Session 1: Introduction to Cognitive-Behavioral Therapy

The first session serves as an introduction to cognitive-behavioral therapy (CBT). Students are introduced to the basic concepts of CBT, including the relationship between thoughts, emotions, and behaviors. The session includes an overview of the goals and structure of the training program. Students participate in ice-breaking activities to build rapport and are encouraged to share their initial thoughts and feelings about the training. This session sets the foundation for the subsequent sessions, ensuring that students understand the purpose and importance of the training.

Session 2: Identifying Negative Thought Patterns

In the second session, students learn to identify negative and irrational thought patterns that can impact their verbal intelligence and overall cognitive performance. Through guided discussions and interactive exercises, students practice recognizing common cognitive distortions such as overgeneralization, catastrophizing, and black-and-white thinking. They are introduced to thought records as a tool to track and analyze their thoughts. This session emphasizes the importance of awareness in managing cognitive

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processes and prepares students to challenge these patterns in future sessions.

Session 3: Challenging Irrational Beliefs

The third session focuses on challenging and restructuring irrational beliefs identified in the previous session. Students are taught techniques such as cognitive restructuring and Socratic questioning to evaluate the evidence for and against their negative thoughts. Role-playing exercises allow students to practice disputing irrational beliefs in a supportive environment. This session aims to help students develop a more balanced and realistic perspective, which is essential for improving verbal intelligence.

Session 4: Developing Positive Self-Talk

In this session, students learn about the power of positive self-talk and how it can enhance verbal intelligence and overall cognitive function. They practice replacing negative thoughts with positive affirmations and constructive self-statements. Activities include creating a list of personalized positive affirmations and engaging in group discussions to reinforce the benefits of positive thinking. This session helps students build a habit of positive self-reinforcement, which supports their cognitive and emotional well-being.

Session 5: Enhancing Verbal Fluency

Session five is dedicated to specific techniques for enhancing verbal fluency. Students engage in activities such as word association games, storytelling exercises, and timed verbal challenges to improve their ability to think and speak spontaneously. The session also covers strategies for expanding vocabulary and practicing verbal expression in various contexts. These exercises are designed to boost students' confidence in their verbal abilities and prepare them for more complex cognitive tasks.

Session 6: Improving Verbal Quality

The focus of the sixth session is on improving verbal quality, which includes clarity, coherence, and articulation. Students participate in activities that require them to organize their thoughts logically and present them clearly. Techniques such as mind mapping, outlining, and structured debates are introduced to help students refine their verbal communication skills. This session aims to enhance students' ability to convey their ideas effectively and persuasively.

Session 7: Managing Verbal Communication

In this session, students learn skills for managing verbal communication in different social and academic settings. Topics include active listening, effective questioning, and appropriate use of tone and body language. Role-playing scenarios and group discussions provide opportunities for students to practice these skills in a controlled environment. The goal is to equip students with the tools to navigate various communication challenges confidently.

Session 8: Building Verbal Coherence

Session eight focuses on building verbal coherence, which involves maintaining a consistent and logical flow in speech and writing. Students are taught techniques for structuring their ideas cohesively, such as using transitional phrases, summarizing key points, and maintaining a clear focus. Activities include collaborative writing exercises and peer review sessions to practice and reinforce these skills. This session helps students develop the ability to produce coherent and organized verbal outputs.

Session 9: Integrating Cognitive and Behavioral Skills

The ninth session integrates the cognitive and behavioral skills learned throughout the program. Students engage in comprehensive activities that combine cognitive restructuring, positive self-talk, and verbal communication strategies. Group projects and presentations allow students to apply their skills in a practical context. This session reinforces the interconnectedness of cognitive and behavioral techniques in enhancing verbal intelligence.

Session 10: Applying Skills in Real-Life Situations

In session ten, students focus on applying their newly acquired skills in real-life situations. They are encouraged to set personal goals for using CBT techniques in their daily lives, particularly in academic and social settings. Role-playing real-life scenarios and peer feedback provide practical experience and build confidence. This session aims to ensure that students can transfer and sustain their skills beyond the training program.

Session 11: Reviewing Progress and Overcoming Challenges

The penultimate session involves reviewing the progress made by students and addressing any remaining challenges. Students reflect on their experiences, share successes and difficulties, and receive personalized feedback from the facilitator. Problem-solving discussions help students develop strategies for overcoming obstacles and maintaining their cognitive and verbal improvements. This session serves as a consolidation of learning and a preparation for continued growth.

Session 12: Conclusion and Future Planning

The final session concludes the training program with a focus on future planning. Students summarize what they have learned and set long-term goals for applying CBT techniques to enhance their verbal intelligence and overall cognitive function. Certificates of completion are awarded,

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and students are encouraged to continue practicing the skills independently. The session ends with a group discussion on the importance of ongoing self-improvement and lifelong learning.

2.4. Data Analysis

Data were analyzed using multivariate covariance analysis and independent t-tests via SPSS-26.

3. Findings and Results

The results indicate that, in the pre-test, the average verbal intelligence scores in the experimental group and the control group did not significantly differ. However, in the post-test stage, the scores of the experimental group were higher in all variables and sub-variables of verbal intelligence compared to the control group. To perform multivariate covariance analysis, several assumptions must be met: normality of the distribution of variables in the population, homogeneity of the variance-covariance matrix, correlation between the dependent variables, and homogeneity of the regression slopes. Each of these assumptions will be examined in the following sections. Based on the results, with a Komolgorov-Smirnov Z value of 1.96 and a significance level higher than 0.05, it can be concluded that the distribution of the variable (verbal intelligence) and its sub-variables in the population is normal (p = 0.36, Z = 0.82).

Table 1

Descriptive Statistics for Verbal Intelligence

Variable	Group	Pre-test M (SD)	Post-test M (SD)	Follow-up M (SD)
Verbal Intelligence	Experimental	45.32 (4.28)	68.57 (5.14)	66.34 (4.97)
	Control	45.67 (4.21)	46.02 (4.18)	45.89 (4.24)

The results of t-test for pre-test (t=0.32, df=28, p=0.76) indicate no significant correlation between the experimental and control groups in any of the research variables in the pre-test.

Table 2

Results of the Covariance Analysis of the Difference in Verbal Intelligence Between the Experimental and Control Groups

Variables	SS	df	MS	F	P	Partial η^2	Power
Verbal intelligence	327.51	1	327.51	4.23	0.003	0.33	1

The results of Table 2 show that, after removing the effect of the pre-test scores, the post-test scores of verbal intelligence in the experimental and control groups are significantly different (F = 4.23, P = 0.003). The effect of cognitive-behavioral skills training on verbal intelligence is 0.33, indicating that 33% of the variance in the remaining scores is due to verbal intelligence training. The statistical power is 1, meaning that the accuracy of this analysis in discovering significant differences is high, and the sample size is sufficient for this test. Based on these findings, it can be concluded that cognitive-behavioural skills training leads to an increase in the verbal intelligence of students participating in English language learning classes.

4. Discussion and Conclusion

The present study aimed to assess the effectiveness of cognitive-behavioral therapy (CBT) training on the verbal intelligence of students participating in English language learning classes. The findings indicate a significant improvement in verbal intelligence scores in the experimental group compared to the control group, supporting the hypothesis that CBT training enhances verbal intelligence.

In the pre-test, the average verbal intelligence scores in both the experimental and control groups were similar, indicating no initial differences between the groups. However, post-test results demonstrated significantly higher scores in the experimental group across all variables and sub-variables of verbal intelligence. This suggests that CBT training positively influences verbal intelligence. The results of multivariate covariance analysis confirmed the assumptions of normality, homogeneity of variance-covariance matrix, correlation between dependent variables, and homogeneity of regression slopes. The findings align with the theoretical framework of CBT, which posits that cognitive restructuring and behavioral interventions can enhance cognitive functions such as verbal intelligence (Dobkin, 2014; Guerlich et al., 2023; Westen, 2000).

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These results are consistent with previous research that has highlighted the effectiveness of CBT in improving various cognitive and psychological outcomes. For example, Dobkin (2014) found that telephone-administered CBT for depression improved neuropsychological functioning in Parkinson's disease patients (Dobkin, 2014). Similarly, Bauer et al. (2017) reported that memory performance predicted the recurrence of mania in bipolar disorder following psychotherapy, indicating the role of cognitive interventions in managing mental health conditions (Bauer et al., 2017). The findings of the current study extend this evidence to verbal intelligence, suggesting that CBT can enhance specific cognitive abilities in students.

The significant increase in verbal intelligence scores in the experimental group can be attributed to the cognitive and behavioral components of the CBT training. Cognitive restructuring techniques, which involve challenging and modifying irrational beliefs, likely contributed to improved verbal fluency, quality, management, and coherence. These findings are supported by the work of Bolla et al. (1990), who identified predictors of verbal fluency in healthy elderly individuals, highlighting the role of cognitive processes in verbal intelligence (Bolla et al., 1990). Furthermore, the current study's results are in line with Boyle et al. (2021), who found that verbal intelligence is a robust measure of cognitive reserve in healthy older adults, underscoring the importance of verbal skills in overall cognitive functioning (Boyle et al., 2021).

The effect size (Partial $\eta^2 = 0.33$) and statistical power (1) indicate that the CBT training had a substantial impact on verbal intelligence, explaining 33% of the variance in the post-test scores. This aligns with previous findings on the effectiveness of cognitive interventions. For instance, Fry (1984) examined teachers' conceptions of students' intelligence and found significant correlations between cognitive abilities and educational outcomes (Fry, 1984). Similarly, Garaigordobil, Berrueco, and Celume (2022) demonstrated that interventions aimed at developing creativity and social-emotional competencies through play had a positive impact on children's cognitive abilities (Garaigordobil et al., 2022).

Despite the promising findings, the study has several limitations. Firstly, the sample size was relatively small, with only 30 participants, which may limit the generalizability of the results. Future studies should include larger sample sizes to enhance the robustness of the findings. Additionally, the study focused solely on male students in a specific geographic region (Shiraz city), which may not be representative of the broader student population. Future research should consider including female participants and expanding the study to different regions to increase generalizability. Furthermore, the study relied on self-reported measures of verbal intelligence, which may be subject to biases. Objective measures and multi-method approaches should be employed in future research to validate the findings.

Future research should address the limitations identified in this study by employing larger and more diverse samples. Additionally, longitudinal studies are needed to examine the long-term effects of CBT training on verbal intelligence and other cognitive abilities. This would provide insights into the sustainability of the cognitive improvements observed in the current study. It would also be beneficial to explore the impact of CBT on other forms of intelligence, such as emotional and social intelligence, to gain a comprehensive understanding of its cognitive benefits. Moreover, future studies should investigate the mechanisms underlying the observed improvements in verbal intelligence, such as changes in neural connectivity and brain function, to elucidate the cognitive processes involved.

The findings of this study have important implications for educational practice. Educators and school psychologists should consider incorporating CBT-based interventions into English language learning curricula to enhance students' verbal intelligence. This could involve training teachers to deliver CBT techniques, such as cognitive restructuring and behavioral activation, within the classroom setting. Additionally, schools should provide ongoing support and resources for students to practice and reinforce the cognitive skills acquired through CBT training. Given the significant impact of verbal intelligence on academic and life outcomes, enhancing these skills through evidence-based interventions like CBT can contribute to students' overall cognitive and psychological development.

In conclusion, the study provides evidence that CBT training effectively enhances verbal intelligence among students participating in English language learning classes. These findings align with previous research on the cognitive benefits of CBT and underscore the potential of cognitive-behavioral interventions to improve specific cognitive abilities. Future research should build on these findings by addressing the study's limitations and exploring the long-term effects and underlying mechanisms of CBT on cognitive functioning. Educators and practitioners should consider integrating CBT-based approaches into educational

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settings to support students' cognitive and psychological growth.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the interview and participated in the research with informed consent.

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