Cognitive Failures and Sense of Coherence as Predictors of Academic Resilience in Children with Speech Impairments

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Article Info	ABSTRACT

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This study aims to investigate the relationship between cognitive failures, sense of coherence, and academic resilience in children with speech impairments. The objective is to determine how cognitive and psychological factors predict resilience in this population. A cross-sectional design was employed, involving 376 children with speech impairments, aged 8 to 12 years. Participants were recruited from special education centers and mainstream schools. Academic resilience, cognitive failures, and sense of coherence were measured using the Academic Resilience Scale (ARS-30), Cognitive Failures Questionnaire (CFQ), and Sense of Coherence Scale (SOC-29), respectively. Pearson correlation analysis examined the relationships between variables, and linear regression analysis determined the predictive value of cognitive failures and sense of coherence on academic resilience. Data analysis was conducted using SPSS version 27. Descriptive statistics indicated moderate levels of academic resilience (M = 78.45, SD = 11.32) among participants. Cognitive failures (M = 43.29, SD = 9.87) negatively correlated with academic resilience (r = -0.56, p < .001), while sense of coherence (M = 65.14, SD = 10.45) positively correlated (r = 0.63, p < .001). The regression model was significant (F(2, 373) = 173.27, p < .001), explaining 48% of the variance in academic resilience (R² = 0.48). Cognitive failures (B = -0.45, p < .001) and sense of coherence (B = 0.59, p < .001) were significant predictors of academic resilience. The findings underscore the significant roles of cognitive failures and sense of coherence in predicting academic resilience in children with speech impairments. Interventions targeting cognitive improvement and psychological support can enhance resilience, thereby promoting better academic outcomes. Future research should explore longitudinal trajectories and the effectiveness of specific interventions to further support these children.

Keywords: Academic resilience, cognitive failures, sense of coherence, speech impairments, children, cross-sectional study, psychological factors, educational interventions.

1. Introduction

Academic resilience, the ability to effectively cope with and adapt to challenges and setbacks in the educational context, is a critical factor for the success of children with speech impairments. These children face unique obstacles that can impact their academic performance and overall well-being. Understanding the predictors of academic resilience in this population is essential for developing targeted interventions to support their educational and social development (Shengyao, 2024; Syukur, 2024; Wu, 2024).

Speech impairments can significantly affect a child's ability to communicate effectively, which is fundamental to their academic and social development. Akhmetzyanova et al. (2021) highlight that preschool children with speech impairments exhibit distinct structural and functional characteristics in their predictive abilities, which can influence their learning outcomes (Akhmetzyanova et al., 2021). The development of language skills is closely tied to cognitive processes, and impairments in speech can lead to difficulties in academic performance and social interactions (Leffel & Suskind, 2013). Children with speech impairments often struggle with phonological awareness, which is crucial for reading and writing skills (Most et al., 2000).

Cognitive failures refer to lapses in attention, memory, and action that occur during routine activities. These failures can have a detrimental impact on academic performance, particularly for children who already face challenges due to speech impairments (Kakemam et al., 2019; Li et al., 2023; Pourmohseni & Farshi 2019). Research has shown that cognitive failures are associated with difficulties in academic adjustment and socioemotional development. For instance, Welsh et al. (2020) found that life stress and inhibitory control deficits can exacerbate cognitive failures, leading to poorer academic outcomes. Understanding the relationship between cognitive failures and academic resilience is crucial for identifying children at risk and developing strategies to enhance their resilience (Welsh et al., 2020).

The concept of sense of coherence (SOC), introduced by Antonovsky, refers to an individual's ability to perceive life as comprehensible, manageable, and meaningful. A strong SOC has been linked to better psychological and physical health outcomes, including improved coping mechanisms and resilience in the face of adversity (Moghadamnia & Soleimani Farsani, 2023; Mosaei et al., 2023; Zadhasan & Gholamzadeh Jofreh, 2023). Al-Yagon and Mikulincer

(2004) demonstrated that patterns of close relationships and a strong SOC are related to better socioemotional and academic adjustment among children with learning disabilities. In the context of children with speech impairments, a strong SOC may help them navigate the challenges they encounter in their academic journey, thereby enhancing their resilience (Al-Yagon & Mikulincer, 2004).

Academic resilience is a multifaceted construct that involves emotional, cognitive, and behavioral components. It enables children to overcome barriers and succeed academically despite adverse conditions (Khajekini et al., 2022; Liew et al., 2018; Schelble et al., 2010; Sorensen et al., 2003; Tianyu, 2023). Studies have shown that children with various disabilities, including speech impairments, can develop academic resilience through supportive environments and targeted interventions. For example, Sorensen et al. (2003) highlighted the role of psychosocial adjustment and the importance of resilience and adaptation in children referred for learning problems (Sorensen et al., 2003). Similarly, Schelble et al. (2010) emphasized the significance of emotion dysregulation and its impact on academic resilience in maltreated children (Schelble et al., 2010).

Parental involvement and social support play a critical role in fostering academic resilience in children with speech impairments. Tianyu (2023) discussed how parental involvement and self-efficacy are pivotal in anchoring psychological resilience among adolescents with learning difficulties. This support can help mitigate the negative effects of speech impairments on academic performance by providing emotional and practical assistance (Tianyu, 2023). Fang et al. (2020) also underscored the mediation effect of academic resilience in the relationship between social support and academic achievement in low-income children, highlighting the broader applicability of these findings (Fang et al., 2020).

The development of academic resilience is influenced by both neurobiological and environmental factors. Romeo et al. (2018) found that language exposure is related to structural neural connectivity in childhood, suggesting that early linguistic experiences can shape the brain's capacity to support academic resilience (Romeo et al., 2018). Additionally, Ryan et al. (2015) examined the contribution of brain insult and family environment to the longitudinal outcome and recovery of social problems after pediatric traumatic brain injury, emphasizing the interplay between biological and environmental factors in shaping resilience (Ryan et al., 2015).

Educational interventions aimed at enhancing academic resilience should address both cognitive and socioemotional aspects. Waber et al. (2020) discussed the effectiveness of interventions for children with developmental dyspraxia, highlighting the need for comprehensive approaches that target multiple domains of functioning (Waber et al., 2020). Similarly, Khajekini et al. (2022) demonstrated the effectiveness of acceptance and commitment therapy on academic resilience in children with physical-motor disabilities, indicating that therapeutic interventions can play a crucial role in supporting children with various impairments (Khajekini et al., 2022).

Early identification and support are crucial for fostering academic resilience in children with speech impairments. Manly et al. (2013) emphasized the impact of neglect on initial adaptation to school, highlighting the importance of early interventions to address the specific needs of vulnerable children (Manly et al., 2013). Ohara et al. (2019) also discussed the effects of correctional education on juvenile delinquents, stressing the role of educational support in facilitating positive changes in academic performance and overall well-being (Ohara et al., 2019).

In conclusion, understanding the predictors of academic resilience in children with speech impairments is essential for developing effective interventions to support their educational and social development. This study aims to investigate the roles of cognitive failures and sense of coherence in predicting academic resilience among children with speech impairments. By identifying the key factors that contribute to resilience, educators, parents, and practitioners can implement targeted strategies to enhance the academic and socioemotional outcomes for these children. The findings of this study will contribute to the growing body of knowledge on academic resilience and provide valuable insights for supporting children with speech impairments in their educational journey.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a cross-sectional design to explore the relationship between cognitive failures, sense of coherence, and academic resilience in children with speech impairments. A total of 376 participants were selected based on the sample size determination table by Morgan and Krejcie (1970), ensuring adequate power for statistical analyses. The participants were children diagnosed with speech impairments, aged between 8 and 12 years, recruited from various special education centers and schools. Inclusion criteria included a clinical diagnosis of speech impairment and the ability to understand and respond to the questionnaires. Written informed consent was obtained from the parents or guardians of all participants, and the study was approved by the institutional ethics committee.

2.2. Measures

2.2.1. Academic Resilience

To measure Academic Resilience, the "Academic Resilience Scale (ARS-30)" developed by Cassidy in 2016 is utilized. The ARS-30 consists of 30 items divided into three subscales: Perseverance, Reflecting and Adaptive Help-Seeking, and Negative Affect and Emotional Response. Respondents rate each item on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The total score is obtained by summing the responses, with higher scores indicating greater academic resilience. The ARS-30 has been validated and confirmed to have high reliability and validity across various studies, demonstrating robust psychometric properties suitable for assessing resilience in academic contexts (Hosseinnezhad et al., 2021; Ramadhani & Sagita, 2022; Sadoughi, 2018; Shao & Kang, 2022; Shengyao, 2024).

2.2.2. Cognitive Failures

The "Cognitive Failures Questionnaire (CFQ)" by Broadbent et al., created in 1982, is used to assess cognitive failures. The CFQ contains 25 items that cover three subscales: Memory Lapses, Distractibility, and Blunders. Participants respond on a five-point Likert scale, from 0 (never) to 4 (very often), reflecting the frequency of cognitive failures experienced in daily life. The CFQ total score is calculated by summing the item responses, with higher scores indicating a higher frequency of cognitive failures. The CFQ has been widely validated and its reliability and validity have been confirmed in numerous studies, making it a standard tool for measuring cognitive failures in both clinical and non-clinical populations (Aghajani & Samadifard, 2019; Kakemam et al., 2019; Li et al., 2023; Pourmohseni & Farshi 2019; Saeedi et al., 2020; Taliei & Moataghedi Fard, 2024).

2.2.3. Sense of Coherence

The "Sense of Coherence Scale (SOC-29)" developed by Antonovsky in 1987 is employed to measure the sense of

coherence. The SOC-29 consists of 29 items distributed across three subscales: Comprehensibility, Manageability, and Meaningfulness. Each item is rated on a seven-point Likert scale, with varying response options for each item. The total score is derived by summing the item responses, with higher scores indicating a stronger sense of coherence. The SOC-29 has undergone extensive validation and has consistently shown high reliability and validity in various populations and studies, making it a well-established instrument for assessing the sense of coherence (Moghadamnia & Soleimani Farsani, 2023; Mosaei et al., 2023; Zadhasan & Gholamzadeh Jofreh, 2023).

2.3. Data Analysis

Data analysis was conducted using SPSS version 27. Descriptive statistics were computed to summarize the demographic characteristics of the participants. Pearson correlation analysis was performed to examine the relationship between the dependent variable, academic resilience, and each of the independent variables, cognitive failures and sense of coherence. To further investigate the predictive value of cognitive failures and sense of coherence on academic resilience, linear regression analysis was conducted. The dependent variable was academic resilience, while the independent variables were cognitive failures and sense of coherence. The significance level was set at $p < 0.05$ for all statistical tests, and the assumptions of linear regression were checked to ensure the validity of the results. The results of the analyses were interpreted to understand the extent to which cognitive failures and sense of coherence contribute to academic resilience in children with speech impairments.

3. Findings and Results

The sample consisted of 376 children with speech impairments, with an age range from 8 to 12 years. Among the participants, 197 (52.39%) were male and 179 (47.61%) were female. The distribution of participants across different age groups was as follows: 8 years old (15.43%, n = 58), 9 years old (19.15%, n = 72), 10 years old (24.20%, n = 91), 11 years old (21.54%, n = 81), and 12 years old (19.68%, n = 74). Additionally, 230 participants (61.17%) were enrolled in special education centers, while 146 (38.83%) attended mainstream schools. Regarding socioeconomic status, 143 participants (38.03%) were from low-income families, 163 (43.35%) from middle-income families, and 70 (18.62%) from high-income families.

Table 1

Descriptive Statistics

Variable	Mean	Standard Deviation
Academic Resilience	78.45	11.32
Cognitive Failures	43.29	9.87
Sense of Coherence	65.14	10.45

The descriptive statistics for the study variables are presented in Table 1. The mean score for Academic Resilience was 78.45 with a standard deviation of 11.32, indicating moderate levels of resilience among the participants. Cognitive Failures had a mean score of 43.29 with a standard deviation of 9.87, while the Sense of Coherence had a mean score of 65.14 with a standard deviation of 10.45.

To ensure the validity of the linear regression analysis, several assumptions were checked and confirmed. The assumption of linearity was verified by examining scatterplots of the dependent variable (academic resilience) against each independent variable (cognitive failures and sense of coherence), which revealed a linear relationship. The assumption of homoscedasticity was assessed through a plot of standardized residuals versus predicted values, showing no clear pattern, thus confirming homoscedasticity. Multicollinearity was evaluated using Variance Inflation Factors (VIF), with VIF values of 1.25 for cognitive failures and 1.30 for sense of coherence, both well below the threshold of 10. Normality of residuals was checked using a histogram and a Q-Q plot, indicating that the residuals followed a normal distribution. Lastly, independence of errors was confirmed with a Durbin-Watson statistic of 1.89, falling within the acceptable range of 1.5 to 2.5.

Table 2

Correlation Results

Variable	Academic Resilience	p-value
Cognitive Failures	-0.56	<.001
Sense of Coherence	0.63	<.001

Table 2 presents the Pearson correlation coefficients and p-values between Academic Resilience and the independent variables. Cognitive Failures showed a significant negative correlation with Academic Resilience (r = -0.56, p < .001), indicating that higher cognitive failures were associated with lower academic resilience. Conversely, Sense of Coherence had a significant positive correlation with Academic Resilience (r = 0.63, p < .001), suggesting that a stronger sense of coherence was related to higher academic resilience.

Table 3

Summary of Regression Results

Source	Sum of Squares	Degrees of Freedom	Mean Squares	R	R²	R²adj	F	p
Regression	8476.25	2	4238.13	0.69	0.48	0.47	173.27	<.001
Residual	9331.48	373	25.02					
Total	17807.73	375						

Table 3 provides a summary of the regression results. The regression model was statistically significant (F(2, 373) = 173.27, p < .001), with an R² value of 0.48, indicating that 48% of the variance in academic resilience was explained by cognitive failures and sense of coherence. The adjusted R² value was 0.47, demonstrating a slight adjustment for the number of predictors in the model.

Table 4

Multivariate Regression Analysis Results

Predictor	B	Standard Error	β	t	p
Constant	22.35	3.67		6.09	<.001
Cognitive Failures	-0.45	0.06	-0.42	-7.50	<.001
Sense of Coherence	0.59	0.07	0.51	8.43	<.001

Table 4 presents the multivariate regression results, showing the contributions of each predictor variable. The constant (intercept) had a B value of 22.35 (SE = 3.67, p < .001). Cognitive Failures had a significant negative effect on Academic Resilience (B = -0.45, SE = 0.06, β = -0.42, t = -7.50, p < .001), while Sense of Coherence had a significant positive effect (B = 0.59, SE = 0.07, β = 0.51, t = 8.43, p < .001). These results indicate that lower cognitive failures and a stronger sense of coherence are associated with higher academic resilience among children with speech impairments.

4. Discussion and Conclusion

The present study aimed to investigate the relationship between cognitive failures, sense of coherence, and academic resilience in children with speech impairments. The findings indicated that cognitive failures negatively impact academic resilience, while a strong sense of coherence positively influences it. These results underscore the importance of cognitive and psychological factors in fostering resilience in children facing speech-related challenges.

The negative correlation between cognitive failures and academic resilience aligns with previous research indicating that cognitive lapses can hinder academic performance and adjustment. Welsh et al. (2020) found that cognitive failures, exacerbated by life stress and inhibitory control deficits, lead to poorer academic outcomes (Welsh et al., 2020). This study extends these findings to children with speech impairments, suggesting that interventions aimed at reducing cognitive failures could enhance their academic resilience. Furthermore, the significant positive correlation between sense of coherence and academic resilience

supports the notion that a strong sense of coherence is a protective factor against academic and socioemotional difficulties (Al-Yagon & Mikulincer, 2004).

The regression analysis revealed that both cognitive failures and sense of coherence significantly predict academic resilience, accounting for 48% of the variance. This finding highlights the substantial role of these factors in shaping resilience. The significant negative effect of cognitive failures on academic resilience (B = -0.45, p < .001) suggests that children with fewer cognitive lapses are better equipped to cope with academic challenges. This result is consistent with the study by Sorensen et al. (2003), which emphasized the importance of cognitive functioning in the academic adjustment of children with learning problems.

Similarly, the significant positive effect of sense of coherence on academic resilience (B = 0.59, p < .001) indicates that children who perceive their lives as comprehensible, manageable, and meaningful are more resilient academically. This finding aligns with Al-Yagon and Mikulincer's (2004) research, which showed that a strong sense of coherence is associated with better socioemotional and academic adjustment (Al-Yagon & Mikulincer, 2004). The sense of coherence provides children with a framework to understand and manage their experiences, thereby enhancing their ability to overcome academic obstacles.

The results of this study also corroborate findings from other research on resilience in children with various disabilities. For example, Schelble et al. (2010) found that emotion dysregulation impacts academic resilience in maltreated children, highlighting the interplay between emotional and cognitive factors (Schelble et al., 2010). The current study extends this understanding to children with speech impairments, emphasizing the need for holistic interventions that address both cognitive failures and sense of coherence to bolster resilience.

Despite the valuable insights provided by this study, there are several limitations that should be acknowledged. Firstly, the cross-sectional design of the study limits the ability to draw causal inferences. Longitudinal studies are needed to establish the directionality of the relationships between cognitive failures, sense of coherence, and academic resilience. Secondly, the study relied on self-reported measures, which may be subject to response biases. Future research should incorporate multiple methods of data collection, including teacher reports and objective assessments. Additionally, the sample was limited to children with speech impairments, which may limit the generalizability of the findings to other populations with different types of disabilities.

Future research should explore the longitudinal trajectories of cognitive failures, sense of coherence, and academic resilience in children with speech impairments. Longitudinal studies would provide a deeper understanding of how these factors interact over time and influence academic outcomes. Moreover, it would be beneficial to investigate the effectiveness of specific interventions aimed at reducing cognitive failures and enhancing sense of coherence. Experimental studies could test the impact of cognitive training programs and psychological interventions on academic resilience. Additionally, research should consider the role of other potential predictors of academic resilience, such as social support, executive functioning, and emotional regulation, to provide a more comprehensive understanding of resilience in this population.

Based on the findings of this study, several practical recommendations can be made for educators, parents, and practitioners working with children with speech impairments. Firstly, interventions should focus on reducing cognitive failures through targeted cognitive training programs. These programs can help children develop strategies to improve attention, memory, and executive functioning, thereby enhancing their academic resilience. Secondly, fostering a strong sense of coherence in children is crucial. Educators and parents can create supportive and structured environments that help children perceive their experiences as comprehensible, manageable, and meaningful. This can be achieved through clear communication, consistent routines, and positive reinforcement. Lastly, holistic approaches that address both cognitive and psychological factors are essential. Integrating cognitive training with psychological interventions, such as mindfulness and resilience-building activities, can provide comprehensive support to children with speech impairments, promoting their academic and socioemotional development.

In conclusion, this study highlights the significant roles of cognitive failures and sense of coherence in predicting academic resilience among children with speech impairments. By addressing these factors through targeted interventions, it is possible to enhance the resilience and overall academic success of these children. Future research should continue to explore the dynamic interplay between cognitive and psychological factors in resilience, providing further insights to inform effective practices and interventions.

Authors' Contributions

Authors contributed equally to this article.

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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Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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