Prompt Response, Cues-Pause-Point Therapies and Gender on Management of Echolalia among Children with Autism Spectrum Disorder

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Abstract: The repetitive and delayed nature of echolalia can hinder the development of adaptive behaviors and impact the ability to establish rapport with others. This study investigated the effects of prompt response and cues-pause-point therapies on the management of echolalia among children with autism spectrum disorder. A pre-test, post-test, and control group of a 3x2 factorial matrix of quasi-experimental research design was used to assess the effect of the therapies on children with autism spectrum disorder in Ibadan, Nigeria. 90children with autism spectrum disorder were purposively selected using Diagnostic Statistical Manual- V (DSM-V) for ASD (0.70), Gilliam Autism Rating Scale/Third Edition (GARS-3) (in terms of sensitivity= 0.97, ROU/AUC= 0.93). In contrast, the Autism Treatment Evaluation Checklist (ATEC) (0.90) was used for the pretest and posttest to ascertain the presence of echolalia. Participants were assigned to one of three groups: prompt response, cues-pause-point therapies, or control (N = 90, male = 44, female = 46, age range = 3 –5 years old). Twenty-four prompt response and cues-pause-point therapy were held for each experimental group. The findings showed that the main effect of treatment (prompt response and cues-pause-point therapies) ($F_{(2; 72)}$ = 45.519, $p<.05$, η^2 = .558) on the management of echolalia among children with autism was significant, premised on this, the null hypothesis was rejected. The post hoc estimated marginal mean indicates that prompt response treatment was higher than cues-pause-point therapy; however, this difference was statistically significant. The study findings indicated that the impact of gender on managing echolalia in individuals with ASD was not statistically significant. Based on the findings, it is recommended that speech therapists, caregivers, and parents of children with autism spectrum disorder should seek alternative therapy that will take into cognizance other underlying factors associated with the presence of echolalia.

Keywords: Prompt response, cues-pause-point, gender, management of echolalia, children with autism spectrum disorder.

1. INTRODUCTION

Autism spectrum disorder (ASD) is a complex neuro developmental condition that affects individuals differently [1]. It is characterized by persistent difficulties in social communication and social interaction across multiple contexts and restricted, repetitive patterns of behavior, interests, or activities that can significantly impact an individual's daily functioning. The prevalence of ASD, including echolalia, has been estimated at a median of 62 per 10,000 individuals [2]. It is well-established that echolalia, the repetition of speech without communicative intent [3], is a common and prevalent trait observed among children diagnosed with ASD [4]. According to van Santen *et al*. [5], echolalia is experienced by 75% of children with ASD at some point during their development.

There is no consistent terminology and definitions for echolalia, which has hindered research in this field [6]. Repetitive speech [7], vocal imitation [8], spontaneous imitation [9], and perseverative speech [10] are alternative terms used to describe echolalia. The term vocal stereotypy refers to a broad array of vocalizations that may be repetitive, non-contextual, or non-functional [11]. It is imperative to note that vocal stereotypy involves repeating sound responses like squealing, grunting, and babbling [12], sometimes called phonological stereotypy. The repetitive and delayed nature of echolalia can hinder the development of adaptive behaviors [13].

Echolalia can manifest as immediate or delayed repetition of heard speech, including from various sources like songs, TV shows, or movies [14]. Echolalia may be present in children with suspected ASD due to deficits in syntactic competence, such as a lack of speech, pronoun reversal, or out-of-context speech [15]. Extensive studies confirm the correlation between echolalia and various conditions, including epilepsy. Furthermore, it has been found that echolalia can significantly impact the ability to establish rapport

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with others [16]. Echolalia has been associated with various disorders, including frontotemporal dementia, where repetitional responses may not always be meaningless, emphasizing the need for nuanced understanding in clinical settings [17]. Echolalia has been observed in cases of autoimmune encephalitis, unequivocally indicating its presence across various medical conditions [18].

ASD is a prevalent neurodevelopmental disorder characterized by deficits in social communication, restricted interests, and repetitive behaviors [1]. The exact cause of ASD remains unknown [19]. Echolalia children with ASD may not necessarily correlate with severity [5]. Children with ASD may exhibit a range of symptoms beyond echolalia, including catatonic symptoms, stereotypic movements, and motor stereotypies [20, 21].

Recent research suggests that children with ASD may use echolalia as an active approach to communication and language learning [15]. The literature on echolalia management presents conflicting views on its nature, potential functions, and the role of speech pathologists in treating the condition. As a result, there is a broad spectrum of interventions available. Various interventions have been proposed, such as incorporating echolalia to teach receptive labeling [22], utilizing visual supports like arrow cues in discrete trial teaching [23], and implementing behavioral interventions to reduce or eliminate echolalia [24, 25]. Evidence-based practices for children and youth with ASD have been identified, aiming to provide focused intervention strategies [26]. Additionally, systematic reviews have highlighted behavioral treatment approaches like cue-pause point training, script training with visual cues, differential reinforcement, and tact modeling with positive reinforcement as effective in treating echolalia [27, 28]. Furthermore, the role of echolalia in communication and language development in children with ASD has been explored [29]. Literature on echolalia highlights the importance of understanding the phenomenon to tailor interventions effectively [16].

2. LITERATURE REVIEW

2.1. Gender Differences in the Manifestation and Management of Echolalia

This has been a subject of interest in ASD research. In the past, echolalia was considered a behavior that occurs automatically and has no communicative purpose [30]; recent studies have shown variations in its prevalence among genders [22] highlighted that female autistic children exhibit echolalia at a higher rate than males, emphasizing the importance of including females in echolalia research. According to [31], learned or repeated phrases were the most common feature in both genders, challenging the belief that echolalia is the most common stereotyped language feature of ASD. Moreover, research indicates that females with high-functioning ASD (HFASD) tend to display qualitative differences in social communication, including a propensity for echolalia in childhood and questioning in later years [32].

The findings of [33] support the assertion that ASD is expressed differently in males and females. Moreover, [34] suggested that females with ASD may perform better than males on some social skills tests. The prevalence of echolalia in ASD, as highlighted by [14], underscores the importance of understanding and addressing this repetitive speech behavior, especially in school-aged children with ASD. It is important to note that while echolalia is a common feature of ASD, its manifestation and prevalence may vary between genders. Recent studies suggest that females may exhibit higher rates of this behavior, highlighting the need for further research. Further research focusing on gender-specific differences in echolalia can provide valuable insights into the underlying mechanisms and potential tailored interventions for children with ASD.

Gender differences in echolalia management are intertwined with broader aspects of gender in management research [35]. Studies on gender differences in a variety of conditions have been conducted, such as language development disorders [5], primary progressive aphasia [36], and autism spectrum conditions (ASC) [37]. However, the precise relationship between gender and echolalia management is poorly understood. Understanding how gender influences the manifestation and management of echolalia in children with ASD could provide valuable insights into developing more effective interventions. Additionally, studies have highlighted the importance of considering echolalia's different types and contexts in understanding its functions and implications for children with ASD [38, 39].

2.2. Effect of Prompt Response on Managing Echolalia

The effectiveness of the Prompt response (Prompts for Restructuring Oral Muscular Phonetic Targets)

intervention on speech development has been studied in various populations. These interventions often involve prompts to guide children toward desired behaviors or responses. Research has shown that prompt interventions can effectively promote behavior change and skill acquisition. For instance, studies have demonstrated the effectiveness of prompt interventions in teaching children with ASD) to use communication devices [40], increasing response diversity in children with ASD [41], and improving listening comprehension responses in students with intellectual disabilities [42] .Moreover, prompt interventions are beneficial in promoting engagement in mobile health interventions [43] and increasing adherence in adolescents with chronic health conditions [44].

Prompt interventions can benefit various settings, including healthcare, education, and behavioral therapy. They can involve different techniques, such as differential reinforcement, response prompting, and prompt fading [40]. Depending on the desired outcome, prompt interventions can be delivered through different modalities, such as mobile apps, text messaging, or social media platforms [45]. Research by [46] demonstrated that PROMPT intervention significantly improved speech-motor control, articulation, and intelligibility.

Similarly, studies by [47] and [40] found improvements in speech production and intelligibility following PROMPT intervention in children with cerebral palsy and ASD, respectively. According to [40], PROMPT effectively improved speech sound production and control in children with ASD, cerebral palsy, and speech sound disorders. Furthermore, the study by [48] evaluated changes in motor speech control in children with speech sound disorders following PROMPT intervention, indicating positive outcomes [49] reported that motor learning-based interventions like PROMPT can effectively enhance speech-motor abilities among children with cerebral palsy.

2.3. Cues-Pause-Point Therapy on Speech Development

The Cues-Pause-Point therapy method effectively utilizes specific cues, pauses, and points in speech therapy to enhance speech development. According to research by [50], speech cues, such as pauses and pitch features, can be informative for segmenting speech [51] recommended incorporating explicit cues for pause placement when using pacing software to reduce speech rate in conditions such as dysarthria. This recommendation is crucial to ensure the software delivers the expected benefits to its intended users. [52] unequivocally state that prosodic cues such as pauses and lengthening are vital in facilitating speech segmentation and aiding in speech processing [53] found that the Cues-Pause-Point procedures effectively teach the functional use of verbal labeling repertoires to children with speech disorders. This means that individuals can communicate more effectively in their day-to-day lives because of this therapy.

Moreover, cue-pause-point procedures have shown promise in replacing maladaptive speech patterns in children, thereby improving their speech output [54]. These procedures have also been found useful in teaching severely retarded individuals the functional use of observing and listening to others' verbal behavior. This therapy involves structured trainer statements that guide individuals to answer questions correctly, aiding in replacing maladaptive speech patterns [55]. Research has shown that children's speech development heavily relies on auditory-motor learning during speech production. In other words, the process of hearing and producing sounds is crucial for the development of speech-motor skills. The study by [55] further supports this notion and highlights the importance of this process in shaping children's ability to produce speech effectively.

2.4. Processability Theory

Processability Theory, a framework proposed by Pienemann in 1998, focuses on the developmental stages of second language acquisition [56]. This theory suggests that learners progress through a series of stages in acquiring a second language, each characterized by specific linguistic structures that the learner can process. The theory emphasizes the importance of understanding the cognitive processes involved in language acquisition and how learners develop their interlanguage systems [57]. Extensive research on second language acquisition has unequivocally demonstrated that several factors significantly impact the ease or difficulty of acquiring a second language. Some studies suggest that adults may struggle with second language acquisition due to native language transfer, learning strategies, and over-generalizing language materials [58].

However, other researchers argue that adults can acquire a second language quickly due to their high

cognitive abilities, clear thinking, and self-observation skills [56]. The Interaction Hypothesis posits that negotiated interaction, where learners receive feedback on their language use during communication, can facilitate second language acquisition [59]. This highlights the importance of meaningful interactions in language learning processes [60] proposed that high-performing language learners have the potential to overcome the effects of age on language acquisition through their distinct abilities and skills.

Furthermore, the influence of the first language on second language acquisition has been a topic of interest. The transfer process facilitates the development of interlanguage skills among learners by activating their pre-existing linguistic knowledge [61]. Acquiring a second language can be challenging, and understanding how one's first language can interfere with the process is crucial in developing effective language teaching strategies to help learners overcome these challenges.

3. METHODOLOGY

3.1. Research Design

This study utilized a quasi-experimental design with a 3x2x2 factorial matrix to determine the impact of an intervention on participants. Three treatment levels (prompt response, cue-pause-point, and control) and two gender groups as moderating (male and female) were considered. The design is represented thus:

Experimental Group 1 (E1): O_1 X_1 O_4

Experimental Group 2 (E2): O_2 X_2 O_5

Control Group (C): O_3 O_6

O_1 O_2 O_3 represents the pretest scores on echolalia management of the experimental and control groups, respectively.

O_4 O_5 O_6 represents the experimental and control groups' posttest scores, respectively.

X_1 represents the treatment for experimental group 1

X_2 represents the treatment for experimental group 2

3.2. Participants

90 people with ASD were selected for the study. The study recruited children with ASD using purposive sampling based on DSM-V, GARS-3, and ATEC assessments. Participants were grouped into treatment groups tagged prompt response therapy, cues-pause-point therapy, and control, representing their assigned treatment. In prompt response therapy (N = 30, male = 13; female = 17); in cues-pause-point therapy (N = 30, male = 12; female = 18); and in the control group (N = 30, male = 19; female = 11) people with ASD were selected. The participants were between 3 and 5 years old.

Selection Criteria:

a. Inclusion Criteria:

Children diagnosed with ASD.

Children exhibiting echolalia behaviors.

Age range: [3-5 years old].

b. Exclusion Criteria:

Children with other significant comorbidities affecting communication or cognitive abilities.

Children who are currently undergoing other intensive therapeutic interventions for echolalia.

Professionals who collaborated in the study as research assistants were 4 seasoned speech-language professionals employed in the clinics and a volunteer music therapist who had established clinical rehabilitation services with the participants at the time of the study. On average, they had 5 years of job experience.

3.3. Intervention Procedures

3.3.1. Description of Prompt Response Therapy

It aims to reduce echolalia by providing immediate prompts following instances of echolalia, redirecting the individual's communication towards more functional and meaningful exchanges. The therapy sessions are conducted in a structured environment, typically one-on-one with a trained therapist. The therapist will utilize various prompting techniques tailored to the individual's communication abilities and preferences. These prompts may include verbal cues, visual aids, or physical gestures, depending on the individual's responsiveness.

The timing and intensity of prompts are adjusted based on the individual's level of functioning and progress throughout the therapy sessions. Prompt Response Therapy emphasizes the reinforcement of desired communication behaviors through positive reinforcement techniques such as praise, rewards, or

preferred activities. Therapists will work collaboratively with caregivers or family members to generalize the skills learned during therapy sessions to naturalistic settings such as home or school environments.

3.3.2. Cues-Pause-Point

Therapy: Participants with ASD are taught to monitor their communication, initiate pauses, and interrupt echolalia to encourage more meaningful exchanges. Visual or auditory cues, such as a hand signal or verbal cue, were incorporated in therapy sessions to indicate when to pause when talking. Participants were taught to recognize these cues and implement pauses independently, allowing time for self-reflection and decision-making regarding their responses.

During pauses, participants were encouraged to engage in alternative communication strategies, such as generating original responses or asking questions rather than echoing previous utterances. The therapist provided feedback and support to reinforce the successful implementation of pauses and facilitate the development of effective communication skills. The therapy also emphasizes the generalization of skills to real-life situations, with the therapist collaborating with caregivers to create opportunities for practice and reinforcement outside the therapy sessions.

- The therapist uses verbal cues to encourage the child to talk.
- Nonverbal cues (nodding, eye contact) show empathy and understanding.
- Pause-points allow the child to process and regulate their emotions.
- The therapist reflects and validates the client's feelings, creating a safe space for vulnerability.

This dance of cues-pause-points helps the child access deeper emotions, confront fears, and develop self-awareness, fostering a deeper understanding of themselves and their struggles.

3.4. Instrument for Data Collection

3.4.1. Autism Treatment Evaluation Checklist (ATEC)

ATEC is an instrument designed by Rimland and Edelson (1999) [62] of the Autism Research Institute in 2013. However, the norms on the longitudinal changes in ATEC were lacking until when the norms of the observational cohort voluntarily completed ATEC evaluations over four years from 2013 to 2017. It is used to assess the effectiveness of ASD treatments; it was designed nearly two decades ago. The ATEC is a caregiver-administered questionnaire designed to measure changes in the severity of ASD in response to treatment. This instrument fills a gap in clinical practice and research as it measures individual progress along with the treatment. It is the scale that is inversely proportional to the improvement of the subject (the lower the score, the better the condition) and is divided into four subscales that cover all areas affected by autism: Language) communication, sociability, sensory or cognitive awareness, and physical or behavior.

A total score and four subscale scores are reported. Questions in the first three subscales are scored using a 0–2 scale. The fourth subscale, Health/ Physical/ behaviour, is scored using a 0–3 point scale. ATEC can be accessed online or in hard-copy format. The first subscale, Speech or Language or Communication, contains 14 items, and the score ranges from 0 to 28 points. The Sociability subscale contains 20 items; participants can score from 0 to 40. The third subscale, Sensory or Cognitive awareness, has 18 items, and scores range from 0–36. Lastly, the Health or Physical or behaviour subscale contains 25 items. The scores from each subscale are combined to calculate a Total Score ranging from 0–179 points. A lower score indicates a lower severity of ASD symptoms. The instrument is reliable, with a correlation coefficient higher than 0.90.

3.5. Method of Data Collection

a. Pre-Intervention Assessment

Baseline assessment of echolalia frequency, severity, and context.

The presence of ASD was diagnosed with utmost accuracy and assurance through the use of standardized assessment tools, using the Diagnostic Statistical Manual- V (DSM-V) for ASD, the Gilliam Autism Rating Scale/Third Edition (GARS-3), and the Autism Treatment Evaluation Checklist (ATEC).

b. Intervention Implementation

Therapy sessions were conducted thrice a week for eight weeks, each lasting 40 minutes. The therapist implemented Prompt Response and Cues-Pause-Point Therapies according to individualized treatment plans.

Prompt response therapy (PRT) is a behavioral intervention primarily used with individuals on the

autism spectrum. Rooted in Applied Behavior Analysis (ABA) principles, PRT aims to improve language, communication, and social skills through systematic prompting and reinforcement. The therapy targets pivotal areas that lead to widespread improvements in overall functioning, such as motivation, self-management, and social initiation. PRT involves providing a prompt to elicit a desired response and immediately reinforcing that response to encourage its repetition. For example, to enhance communication skills, the therapist prompted a child participating in the intervention to request a toy by saying, "What do you want?" and immediately providing the toy when the child responds correctly.

By consistently applying these techniques and reinforcing positive behaviors, PRT makes learning more natural and engaging. The goals of this structured and supportive approach are to help the child with autism develop communication skills and reduce echolalia,

The researcher developed the cues-Pause-Points (CPP) therapy treatment package to guide the implementation of the therapy. It is an evidence-based intervention designed to enhance communication skills in children aged 3-5. The intervention focused on improving speech fluency and language development through structured interaction techniques.

The therapy involves three key components: Cues, which are signals or prompts given to the child to encourage speech; Pauses, which are intentional breaks in conversation that provide the child with time to process information and respond; and Points, which are moments of emphasis or praise to reinforce successful communication attempts. CPP therapy creates a supportive and engaging environment that promotes language learning by incorporating these elements.

The Bush-Francis Catatonia Rating Scale (BFCRS) was developed by Bush, Fink, Petrides, Dowling, and Francis in 1996 to assess the presence and severity of catatonia [63], a psychomotor syndrome characterized by various motor and behavioral symptoms. The BFCRS consists of a comprehensive 23-item scale and a shorter 14-item screening version [64]. The 23-item scale rates symptoms from 0 (absent) to 3 (severe), covering various catatonic features such as mutism, posturing, and echolalia [63]. The 14-item version is designed for quick screening and can be used to identify patients who require a full evaluation. The scale is administered by clinicians who observe and score the presence and severity of each symptom [64]. Psychometric evaluations of the BFCRS indicate strong reliability and validity, with consistent application in clinical and research settings. The scale's reliability is evidenced by high inter-rater reliability scores of 0.93 [64], and its validity is supported by its ability to identify catatonia and monitor treatment response [65].

c. Post-Intervention Assessment

Re-assessment of echolalia behaviors using the same measures employed in the pre-intervention assessment. Comparison of pre-and post-intervention data to evaluate echolalia frequency, severity, and changes in communication patterns.

3.6. Data Analysis

Using a mixed-design ANOVA, we assessed the outcomes of prompt response therapy and cue-pause-point therapy on echolalia management for the 90 participants. Initial checks ensured compliance with ANOVA assumptions. The analysis focused on comparing post-test scores across the three groups to determine the main effect of treatment, leveraging T-test statistics and assessing interaction effects between time and treatment. Effect sizes were reported using partial eta squared. Subsequent post-hoc analyses with Tukey's HSD test pinpointed specific therapy impacts. A separate ANOVA evaluated gender differences in therapy effectiveness. ATEC scores provided secondary insight into therapy-induced behavioral changes. Statistical significance was set at $p<0.05$. SPSS facilitated analysis, guiding interpretation within the broader autism and echolalia research landscape, affirming the distinct efficacy of prompt response and cue-pause-point therapies.

3.7. Ethical Considerations

Informed consent was obtained from all participants or their legal guardians, and their confidentiality and privacy were rigorously maintained throughout the study. In addition, adherence to ethical guidelines outlined by relevant institutional review boards (IRBs) was ensured. Informed consent was obtained from the participating professionals to ensure their cooperation and engagement in the study.

3.7.1. Strengths

Direct comparison of two therapeutic approaches within a controlled setting.

Utilization of standardized assessment measures to quantify changes in echolalia behaviors.

Potential for informing clinical practice and guiding future research in the field of intervention for children with ASD.

4. RESULTS

4.1. Hypotheses Testing

4.1.1. This Section Presents the Result of the Tested Hypotheses

The following hypotheses were tested in this study

Ho 1: There is no significant difference in PRT: Prompt response treatments and echolalia management among children with ASD.

Table **1** revealed that there was a significant difference in the effect of PRT: Prompt response treatment son echolalia management among children with ASD. It was observed that the t-Calculated value was more substantial than t-Critical values (t-Cal= 9.94 > t-Crit =1.960), (P<0.05). There was a considerable difference. Also, the mean difference shows that PRT: Prompt response treatments have a higher mean value of 43.60 and a standard deviation of 6.88 than Echolalia management's mean value of 29.50 and a standard deviation of 4.06, respectively. Hypothesis rejected. Therefore, it was concluded that there is a significant difference in the effect of PRT: Prompt response treatment son echolalia management among children with ASD.

Ho 2: There is no significant difference in the effect of CPP: Cues-pause-point treatments on echolalia management among children with ASD.

Table **2** revealed that there was a significant difference in the effect of CPP: Cues-pause-point treatments on echolalia management among children with ASD. It was observed that the t-Calculated value was more substantial than the t-Critical values (t-Cal= 9.94 > t-Crit =1.960), (P<0.05). There was a significant difference. Moreover, the mean difference shows that CPP: Cues-pause-point treatments have a higher mean value of 37.07 and a standard deviation of 8.76 than Echolalia management's mean value of 29.50 and a standard deviation of 4.06, respectively. Hypothesis rejected. Therefore, it was concluded that there is a significant difference in the effect of CPP: Cues-pause-point treatments on echolalia management among children with ASD.

Ho 3: There is no significant difference in gender in echolalia management among children with ASD.

Table **3** revealed that there was no significant gender difference in echolalia management among children with ASD. It was observed that the t-Calculated value was less than the t-Critical values (t-Cal= 0.18 < t-Crit =1.960), (P>0.05). There was no significant difference. Furthermore, the mean difference between males and females shows a slight difference, with a mean value of 36.78 for males and 36.74 for females. The results indicate that there is no significant difference between genders regarding echolalia management among children with ASD.

Table 1: T-Test of Difference in PRT: Prompt Response Treatments and Echolalia Management among the Children with ASD

Variables	N	Mean	SD	df.	t-Cal	t-Crit	P
Echolalia management	30	29.50	4.06	29	9.94	1.960	0.000 (p<0.05) It Significant
PRT: Prompt responsetreatments	30	43.60	6.88				
Total	60						

Table 2: T-Test of Difference in the Effect of CPP: Cues-Pause-Point treatments on Echolalia Management among children with ASD

Variables	N	Mean	SD	df.	t-Cal	t-Crit	P
Echolalia management	30	29.50	4.06	29	3.932	1.960	0.000 (p<0.05) It Significant
Cues-pause-pointtreatments	30	37.07	8.76				
Total	60						

Table 3: T-test of Gender Difference on Echolalia Management among Children with ASD

Variable	Status	N	Mean	SD	df.	t-Cal	t-Crit	P
Echolalia management	Male	40	36.78	8.31	88	0.18	1.960	0.98 (p<0.05) Not Significant
	Female	50	36.74	9.41				
	Total	90						

Ho 4: There is no significant difference in years of ageon echolalia management among children with ASD.

Table **4** presents the ANOVA analysis, which showed no significant difference in age in echolalia management among children with ASD. According to the mean scores for children with ASD, age 4 years was 37.04, followed by 3 years with a mean value of 36.89, and 5 years with a mean value of 36.39. Therefore, it can be concluded that there was no significant difference in years of age on echolalia management among Children with ASD (F value (2/87) = 0.045, Pro=0.956 > 0.05). These imply that there was no significant difference in years of age on echolalia management among children with ASD.

5. DISCUSSION OF FINDINGS

Based on the hypothesis, the results show that treatment (prompt response and cues-pause-point therapies) had a significant effect on managing echolalia among children with ASD. The current finding aligns with the assertion by [40] that studies have shown the effectiveness of prompt interventions in teaching children with ASD to use communication devices. According to Hudson and Browder [42], such interventions improve listening comprehension responses in students with intellectual disabilities. The study's findings strongly support [54] claim that cue-pause-point procedures effectively replace maladaptive speech patterns in children and improve their speech output.

According to the study, the participants who received prompt response training performed better than the cues-pause-point therapy and control groups. This result suggests that prompt response training may be a more effective treatment approach than other methods. The result of the present study aligns with the report of [52] that cues-pause-point language training is an effective method for teaching children with echolalia how to use their verbal labeling repertoires functionally. This leads to a decrease in immediate echolalia and an increase in correct responses. The difference between cues-pause-point therapy and prompt response was significant based on the observations made.

The finding on gender effect on the management of echolalia among children with ASD was not significant. The research finding is not consistent with the report by [66] that showed significant differences between genders in restricted and repetitive behavior, particularly for children with no unusual sensory interest and minimal verbal ability. The findings contribute to providing evidence on phenotypical differences in pre-school children with a diagnosis of ASD. The present result did align with the earlier study conducted [5], which submitted that there were no significant differences between genders in how echolalia was presented or managed in children with ASD. The result suggests that the management of echolalia should be tailored to the individual's specific characteristics and needs and not gender-related factors.

Studies found that the gender-based differences in the domains of deficits compared to previous studies were insignificant, which had shown that females, on average, have fewer deficits in these areas than males [34, 67, 68]. Research conducted by Tang *et al.* [31] suggests that females with ASD tend to engage in

Table 4: ANOVA Showing the Significant age Range Difference in Echolalia Management among Children with ASD

Socioeconomic status of parents	N	Mean	Std Dev	Sum of Square	df.	Mean Square	F	p.(Sig)
3 years	27	36.89	11.24	7.350	2	3.675	0.045	0.956 Not significant
4 years	25	37.04	7.49	7060.706	87	81.158		
5 years	38	36.39	8.10	7068.056	89			
Total	90							

more pretend play and echolalia and have more mainstream interests compared to males. However, the study also found that gender does not significantly affect the management of echolalia within the context of ASD. This information is supported by robust research and can be confidently asserted.

CONCLUSION

The study explored the impacts of prompt response and cues-pause-point therapies on echolalia management among individuals with ASD. The findings revealed a significant improvement in managing echolalia, particularly among those who underwent prompt response training, showcasing superior outcomes compared to both the cues-pause-point therapy group and the control group. This aligns with existing literature asserting the effectiveness of prompt interventions in enhancing communication and speech output in children with ASD, as well as in reducing maladaptive speech patterns. Despite expectations of gender-based differences in the management and presentation of echolalia, the study found no significant impact of gender on the effectiveness of the treatment approaches, indicating that echolalia management should be individualized rather than generalized based on gender.

In light of these findings, a nuanced approach to managing echolalia in ASD is recommended. Given the superior outcomes associated with prompt response training, this method should be emphasized within therapeutic contexts. This entails not only prioritizing its application in treatment plans but also ensuring that clinicians and therapists are adequately trained in its execution. The study's indication that gender does not significantly impact treatment outcomes underscores the importance of developing individualized treatment plans that cater to each child's specific requirements rather than adhering to generalized strategies based on gender.

Furthermore, the study advocates for continued research to explore the long-term efficacy of prompt response training in contrast to other interventions, aiming to deepen the understanding of its mechanisms and potential for reducing echolalia among individuals with ASD, enhancing professional training and awareness regarding these targeted interventions can contribute to broader implementation and understanding of effective echolalia management strategies. Additionally, increasing awareness and education among parents, educators, and caregivers about the benefits of tailored interventions can empower them to support the communication needs of individuals with ASD more effectively. Adopting these insights and recommendations promises to refine echolalia management strategies for individuals with ASD, fostering improved communication skills and, consequently, a higher quality of life.

LIMITATIONS

This study on managing echolalia among children with autism spectrum disorder via prompt response and cues-pause-point therapies faces limitations impacting its broader applicability. Firstly, the quasi-experimental design without random assignment limits generalizability. The sample, confined to a specific age group (3 – 5 years old) from Ibadan, Nigeria, restricts its findings' relevance across different demographics and geographical locales. With interventions fixed at twenty-four sessions for each group, the study may not fully capture long-term effects or the complete potential for behavioural change.

Moreover, focusing exclusively on two therapeutic approaches without considering other variables like cognitive function or ASD severity may overlook factors influencing echolalia management. Employing specific assessment tools (DSM-V, GARS-3, ATEC) could also constrain the nuanced detection of echolalia changes. Additionally, determining that gender does not significantly impact echolalia management needs cautious interpretation due to the study's sample size and gender distribution, possibly masking subtle differences. These considerations suggest future research should embrace more diverse methodologies, longer study durations, and broader participant demographics to enhance understanding and intervention strategies for echolalia in autism spectrum disorder.

SUGGESTIONS FOR FUTURE RESEARCH

Further studies could explore various avenues to enrich the understanding and effectiveness of therapies for managing echolalia in individuals with autism spectrum disorder (ASD). Longitudinal research might provide insights into the long-term efficacy of prompt response and cues-pause-point therapies. Comparative studies could evaluate these therapies against other interventions like Applied Behavioural Analysis (ABA) or music therapy, offering a broader perspective on therapeutic options. Investigating the benefits of combining therapies could reveal potential

synergies for more comprehensive treatment approaches. Additionally, research focusing on the impact of caregiver and educator training in implementing these therapies could highlight the importance of supportive environments. Personalizing therapies based on individual needs promises to enhance their effectiveness, considering the diversity among individuals with ASD. Improving social skills and quality of life resulting from better-managed echolalia could offer a more holistic view of treatment outcomes. Moreover, exploring the integration with technological tools like virtual reality (VR) and artificial intelligence (AI) might introduce innovative and engaging ways to manage echolalia, opening new pathways for effective intervention in ASD care.

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