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The Effect of Sentence Structure Training on the Progress of Chinese Children with Autism in English Grammar Acquisition

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Abstract: This research proposal aim to examine grammatical training on children with ASD and its impact on their language ability and communication skills. Data will be collected by an experiment in a real-life classroom environment setting. Experimental group and control group are set to compare the impact of sentence structure training to children with Autism Spectrum Disorder on their grammatical acquisition and English language development. A pre-test includes 20 grammatical questions will be given to the students before the beginning of the experiment in order to assess the baseline of students' grammar ability. A post-test includes anther 20 grammatical questions which has same difficulty but different questions will be used at the end of the training period which aims to examine the result of the sentence training sessions. The data collection will be used to evaluate how and to what extent sentence structure training on the progress of Chinese children with Autism in their English grammar acquisition. The result of this research proposal is expected to provide information to the further language development of special groups of children.

Keywords: Autism, Grammatical training , second language acquisition

1. Introduction

1.1. Prior Research

Mentioned by Tager-Flusberg, H., from a clinical perspective, it's essential to identify the different language phenotypes because different treatment plans and school arrangements will be conducted as well as the link between the long-term prognosis of children with Autism Spectrum Disorder and their language ability. [1] For children with Autism Spectrum Disorder, there's no doubt that pragmatic acquisition is essential during the process of language development. Undeniably, grammar proficiency plays a crucial role. Several research studies have consistently indicated that children with Autism Spectrum Disorder (ASD) frequently experience challenges in acquiring and utilizing grammar rules, resulting in notable impacts on their language development and communication abilities. Eigsti IM, Bennetto L. mentioned that elder children with autism that are high-functioning are often considered to have intact grammatical abilities, despite pragmatic impairments. [2] The inspiration is also evoked by the study of Tek, S., Mesite, L., Fein, D., & Naigles, L. R. which focus on the longitudinal analyses of expressive language development reveal two distinct language profiles

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among young children with autism spectrum disorders. This longitudinal study examines expressive language development in children with ASD over time. It investigates different language profiles among children with ASD and identifies patterns in sentence structure and grammar acquisition. [3]

Research results from various region of numbers of different language acquisition consolidate the phenomenon. The study of Fernández-Alvarez, C. and Rodríguez, C. emphasizes the importance of acquisition of syntax in Spanish-speaking children with autism and the effect on sentence imitation. It examines the impact of structured training exercises focusing on sentence structure and the participants' ability to generate grammatically correct sentences in Spanish. [4] The study by Roberts used experimental probed designed to elicit third person and past tense morphology with a large heterogeneous sample of children with autism. It reveals that the subgroup of children with autism that were language impaired showed high rates of omission of tense marking on the experimental tasks. In addition, some children with Autism Spectrum Disorder performance errors that were specific to the autism population, such as Echolalia. These findings enable the further refining of the characteristics of language impairment. [5] The study of Norbury points out the relationship between grammar and comprehension skills by doing comparison of specific language impairment, pragmatic language impairment, and high-functioning autism. The study also explores the inferential processing and story recall abilities in children with communication problems, including those with Autism Spectrum Disorder. [6] Moreover, the study done by Kedar, Y. and Mostofsky, S. H. evaluate the circumstance of thinking outside the syntax box, focusing on the challenges individuals with ASD face in sentence comprehension, including difficulties with syntactic processing. They also discuss the importance of incorporating both syntax and semantics in language interventions to improve sentence comprehension and production skills in children with ASD. [7] The research done by Wang, J., Hu, X., Liu, D., Wang, Q., Zhou, Q. and Spivey, M. J evaluate the impact as well. This study investigates the effects of practice-based grammar training on syntactic processing in children with ASD. The research assesses the participants' language abilities using various tests before and after the training, highlighting improvements in language production and understanding. [8]

Hence, grammatical acquisition worth further research.

1.2. Project Summary

This research proposal focuses on examining grammatical acquisition training on children with Autism Spectrum Disorder and its impact on their language development. English language proficiency is becoming increasingly significant accompanied by globalization. With children with Autism Spectrum Disorder (ASD), English language skill acquisition is remarkably obstructive. Undoubtedly, grammar plays a critical role in language development, while children with ASD are facing tough difficulty in the field of sentence structure proficiency.

This research proposal provides a research plan to investigate the effect of sentence structure training on the progress with children with ASD in their English grammar acquisition. By using random sampling method, a lab experiment is designed in an artificial classroom setting, with a experimental group which no only receive daily English courses but also take sentence structure training and a control group without special sentence training. Samples include 40 Chinese children with ASD aged between 6 and 10, specifically separated in to the combination of boys and 20 girls, will be equally divided into the two groups. In order to ensure the accuracy to the maximum extent, samples will be recruited from special education schools or therapy centers in different regions of China, and the extent of autism among the student will first be checked with the schools and organizations to ensure that the samples are within the appropriate medium range, specifically in level 2 measure by the DSM-5. Pre and post-intervention assessments with 20 grammatical questions will be conducted to measure participants' English grammar skills. Standardized assessments, such as the Test of English Grammar (TEG), will be used to evaluate participants' understanding of sentence

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structure, grammatical rules, and sentence formulation in English. Qualitative data will also be collected through interviews and observations to gain deeper insights into participants' experiences and perceptions of the training program.

The study expects to find that sentence structure training will lead to significant improvements in English grammar acquisition in Chinese children with Autism Spectrum Disorder that receive the special training sessions compared to the control group. The results of this research are expected to provide insights for designing effective interventions that can address the special challenges faced by this population in order to make contribution to the further development of English language acquisition among children with autism.

2. Objectives and Research Questions

2.1. Objectives

1. To examine the baseline levels of English grammar skills in Chinese children with autism, particularly in the area of sentence structure.

2. To test the effectiveness of a structured sentence training program in improving English grammar acquisition in Chinese children with autism.

3. To compare the progress of Chinese children with autism who receive sentence structure training with a control group who do not receive such training.

4. Additional observations will be conducted in order to learn more about the daily situation the children with autism will face and investigate the common grammatical error the children will make during the daily communication.

2.2. Question

1. Which part of grammatical acquisition is the most challenging for children with autism?(e.g.verb, tense, etc.)

With the inspiration of the article by Schaeffer and colleagues, which reviews the current knowledge state on pragmatic and structural language abilities in autism and their potential relation to extralinguistic abilities and autistic traits, the difficulty of grammatical acquisition is revealed relating to various aspects. [9]

When examining the grammatical acquisition of children with autism, it is crucial to focus on the specific areas or components of English grammar that present the greatest challenges to this population. The challenge among individuals can vary with numbers of aspect, including verb usage, tense formation, sentence structure, subject-verb agreement, and comprehension and application of grammatical rules. By identifying and understanding the particular areas where children with autism struggle the most, targeted interventions and support can be done to effectively address these challenges and facilitate their overall English language development.

2. How does sentence structure training impact the English grammar acquisition of Chinese children with autism?

Yi Su and Letitia R. Naigles's findings suggest that core grammatical knowledge may be preserved in children with ASD, even in the face of radical differences in language environment and social/communicative deficits, supporting the contribution of the language faculty in autistic language acquisition. [10]

Sentence structure training plays a crucial role in enhancing the English grammar acquisition of Chinese children with autism. By focusing on the fundamental elements of constructing grammatically correct sentences, such as appropriate word order, subject-verb-object relationships, and sentence coherence, this training is expected to show the progress the children with Autism Spectrum Disorder make from the sentence structure training. Through systematic and structured

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guidance, these children will learn how to analyze sentences, identify sentence components, and comprehend the underlying grammatical structures in English. This training not only strengthens their grammatical knowledge but also enhances their capacity to communicate effectively and comprehend English sentences in order to fostering overall language proficiency and development. The positive impact of sentence structure training on English grammar acquisition in Chinese children with autism can be measured through pre and post-intervention assessments, which evaluate their mastery of sentence structure, grammatical rules, and sentence formulation in English. Additionally, qualitative data collected through daily observations , including the daily communication between children and their friends, parents, and teachers, provide valuable insights into their experiences and perceptions of the training program.

3. Methodology

Quantitative data is extracted from a controlled experimental design. This experimental design includes the implementation of specific interventions, strict data collection protocols, and standardized measures to ensure the reliability and validity of the research findings. This approach enables a systematic evaluation and comparison of key variables, facilitating a comprehensive analysis of the impact and effectiveness of the interventions on the English grammar skills of Chinese children with Autism Spectrum Disorder (ASD) in comparison to the control group.

4. Research plan

4.1. Experimental process

The proposed study will adopt a longitudinal design, following a sample of 40 children aged 6 to 10 years with Autism Spectrum Disorder over a span of 8 weeks. Participants will be recruited from special education school and therapy centre with diverse socioeconomic backgrounds to ensure a representative sample. In order to guarantee the maximum accuracy, careful verify will be taken, including ethical consideration such as detailed communication with parents and schools about the basic information and characteristics of each children after asking for the permission of letting the children to be involved in the experiment. Professional assessment DSM-5 will also be taken in order to make sure the autism extent of the children will be controlled in an appropriate medium level 2. 40 Chinese children diagnosed with autism, including 20 boys and 20 girls that will be equally separated into groups consist of 10 of each gender in order to minimize the noise, will be divided into the experimental group which children will get involve in sentence structure training besides daily English courses, and the control group which will not receive any additional sentence structure training.

At the every first stage of the experiment, all the participants will be asked to take a standardized English grammar assessment called the Test of English Grammar (TEG) This assessment will be used to evaluate participants' understanding of sentence structure, grammatical rules, and sentence formulation in English. The assessment will consist of 20 multiple-choice questions of sentence completion tasks targeting various aspects of English grammar acquisition such as the proper usage of verbs and tense. Qualitative data about the baseline of the participants' grammatical ability will be collected from the pre-test assessment in order to get better arrangement of the later training section.

During the sentence structure training period, all participants from the experimental group will receive an 8 weeks training with two 45-minute sessions per week, while the control group will not be involved in this additional session expect the daily English classes.

After the training period, the participants from both experimental group and control group will take a second round assessment with 20 questions as post-test which has same difficulty but different

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questions. This assessment will measure their progress in English grammar acquisition after the sentence structure training.

4.2. Data Collection&Analysis

The number of correct responses on the English grammar assessment will be recorded for each participant in both the pre-test and post-test. A statistical analysis, such as analysis of covariance (ANCOVA) will be conducted to compare the post-test scores between the experimental and control groups, controlling for the pre-test scores as a covariate. Effect sizes will be calculated to determine the practical significance of the results.

The analysis process will include the comparison between the score the children get in the pre-test and the score in the post-test. The result is expected to show a 10% progress the children make after the sentence structure training sessions in order to solve the second research question.

As for the first research question about the specific part of ASD children's weakness in grammar acquisition, both the pre-test and the post-test are able to reflect the error rate of each knowledge point. Separated exercise is expected in the future research in order to pay attention to the details of knowledge, so as to improve the overall English language ability.

4.3. Ethical Considerations

Researchers will obtain informed consent from parents or legal guardians of the participated children, ensure confidentiality of personal information, allow voluntary participation, minimize harm, and conduct the experiment in accordance with ethical guidelines and regulations for research involving human subject.

Purpose, procedures, potential risks, and benefits will be clearly explain before the beginning of the experiment.

Alternative formats such as visual aids will be considered to use if it's necessary in order to simplify language to ensure the understanding and the influence of the experiment. Assent will be seek from he children themselves even if they may have limited communication ability.

All the information and data gain in the experiment will be carefully safeguarded to ensure the privacy and confidentiality of participants and their families. All personal information and experimental data will only be used during the experiment and will be securely stored and accessible only when authorized.

The data collection and analysis will only be completed with honesty and integrity through appropriate and professional guidance.

4.4. Shortcomings

1. Even though the DSM-5 will be conducted to measure the extent of Autism Spectrum Disorder among different individuals, since Chinese children with autism can have a wide range of abilities, language proficiency levels, and individual characteristics. What's more, different family environment, life experience, and other variability may still effect the accuracy of the result of the research. As a result, the findings from the experiment may not generalize to all Chinese children with autism or to other populations due to cultural, linguistic, or contextual differences.

2. The observation mentioned in the objectives part is a long-term research since in most situations children with Autism Spectrum Disorder are less likely to express their opinion compare with normal kids.

3. The specific questions has not been collected yet and will be completed in future research.

4. After-class cannot be guaranteed which may cause variability of the final result. Activities such as English films and songs may still have impact on the language acquisition.

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5. During the testing process, special circumstances are unavoidable. Cooperation between researchers and participants needs to be carefully controlled.

5. Significance of the Proposed Research

The proposed research on the effect of sentence structure training on the progress of Chinese children with Autism Spectrum Disorder (ASD) in English grammar acquisition is expected to make contributions in the field of language intervention for individuals with ASD from aspects.

First and foremost, the research addresses a crucial gap in the former literature which focusing more on English-speaking populations or individuals from Western cultures. The research focuses on Chinese children with ASD specifically is able to complete the existing literature by targeting children from China.

Furthermore, investigating the effect of sentence structure training in English grammar acquisition is highly relevant, as grammar is a essential component of language competence. Many children with ASD struggle with grammar which may impact their overall communication abilities. Therefore, understanding the effectiveness of sentence structure training on English grammar acquisition in this population could have direct implications for intervention programs and strategies, leading to improved language outcomes for Chinese children with Autism Spectrum Disorder.

Last but not least, another notable contribution of this research lies in its potential insight which can provide ideas for effective instructional strategies for teaching English grammar to Chinese children with Autism Spectrum Disorder. Thus, the overall English language acquisition may be enhanced.

6. Potential future research consideration

Further research is expected to be done to eliminate as much noise as possible. Specifically, longer experimental span may cause noticeable difference to the result. Since children with autism has limited communication skills and relatively introverted personality, advanced observation and running-in test is required both to ensure the final result and ethical considerations. A standardized assessment of grammatical ability is necessary. More throughout alternatives of special circumstances are needed in order to deal with emergency situations. A greater range of participants will also be important to ensure the accuracy and universality.

7. Conclusion

According to the essence of grammatical training and the effect on language acquisition, especially for the samples of this research--Chinese children with Autism Spectrum Disorder, the research proposal aims to testify the significance of sentence structure training on the enhancement of English language learning. By analyzing the data from the experiment, the result is expected to show the effect of the training period on language acquisition. Furthermore, it is expected to provide insight to future research and improvement of second language acquisition on special children.

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