

## Speech and Prosody Characteristics of Autists

\* Irfan Abbas Assistant Professor (Corresponding Author)

\*\* Dr. Waqasia Naeem, Assistant Professor

\*\*\* Uzma Naeem

### Abstract



*The Autistic patients suffer from three sorts of impairments that include social communication, social interaction & stereotypical behavior. Previous studies have shown issues with the linguistic competence of such children. The present study has primarily focused upon the phonological abilities of the autistics children. The sample of this study comprised of six students between four to twenty years of age. The selection was done through purposive non random sampling technique. The data was collected through video recordings. Observational notes were also jotted down. Furthermore, the researcher interviewed parents and speech therapist to obtain full picture of child's ailment. The results of the study showed issues in different areas of phonological abilities of the children. These included both segmental as well as suprasegmentally aspects of the language. The study ended up by giving some useful suggestions and recommendations.*

**Keywords:** Autism, Phonetics, Segmental, Suprasegmental, Errors

### Introduction & Background of the Study

Most studies of phonetics deficits in ASD have examined children rather than adults or even adolescents (e.g., Baltaxe et al., 1984; Bonneh et al., 2011; Diehl et al., 2009; & Sharda et al., 2010). So, there is a dire need of such a study which shall analyze this phonetic deficits in the autists of different ages. Secondly, there hasn't been much study to find out the impact of gender on the phonetic deficits in autism. This study is an attempt to fill up this gap in the present research. This study will also have some practical implications as well because if the problems related with phonetic deficits can be identified, then it will help to design the materials for the teaching of the autistic children. Moreover, necessary steps can be taken to initiate and improve the communication skill of the autists only when the difficulties that the autists experience will be acknowledged. It will also raise awareness among the general mass that they should facilitate every possibility to create an environment which will render support and encourage to the autistic children

### Research questions

1. What are the segmental and suprasegmental errors present in the speech of autists?
2. What is the impact of age and gender on communicative characteristics of autists?

### Limitations & Delimitations

As it requires lot of time and resources to explore all the segmental and suprasegmental errors present in the speech of autists so the researcher shall delimit his research to the exploration of certain aspects only. Furthermore, the communicative characteristics will also be delimited accordingly. In addition to this, there are certain limitations which might create difficulties during the present study. The limitations are presented as under:

- a. Unfortunately, there are very limited number of schools in Pakistan which provide education to autistic children.
- b. It is tough to do survey in these schools because the administrative staff of these schools is hesitant to permit access to these students.
- c. As autistic children need constant attention so the teaching staff is rarely available for filling up any questionnaire or providing information about the autistic children.
- d. Autistic children feel uneasiness in the presence of strangers that's why it is tough to have one to one interaction with them.

\* UCP, Email: [irfanabbas.mul@gmail.com](mailto:irfanabbas.mul@gmail.com)

\*\* MUL, Email: [drwaqasia.eng.mul@gmail.com](mailto:drwaqasia.eng.mul@gmail.com)

\*\*\* FOLL UCP, Email: [uzmayasir04@hmail.com](mailto:uzmayasir04@hmail.com)

### **Research Methodology**

The researcher employed exploratory-descriptive-qualitative methodology for carrying out present study.

#### **Data Collection:**

After describing the research design, this section carries information about the sources of data and methods employed for its collection.

#### **Sources of Data**

The researcher selected six ASDs children and adolescents. The selected ASD participants were put in three different groups. The membership in these groups was based upon the chronological age and gender. The composition of these groups was as under:

Group 1: 4-7 years of age (one male + one female)

Group 2: 7 -11 years of age (one male + one female)

Group 3: 11-20 years of age (one male + one female)

#### **Inclusion Criteria**

The researcher selected same number of autistic students and put them among the TDs of identical age and gender. Thus researcher ended up with total 12 participants i.e. six autists and six normal. The selection of autists was done by strictly following an inclusion criterion.

#### **Procedure of data collection:**

The researcher recorded conversation between these participants and their teacher. The tape recording of interview is considered to be a very reliable method for analyzing prosodic and speech patterns. Same method was used by some other researchers (i.e. Shriberg, 1987) and through the analysis of the speech they came up with the idea that this method is very much suitable for judging the phonological patterns in the speech of typically developing or atypically developing children.

The researcher didn't predefine the topic because he wanted to collect naturalistic data without any intervention. The time set for each conversation was approximately 15 minutes and the teachers asked different questions from the participants. The questions were asked from the areas of family, hobbies, education, general knowledge etc.

There was need of observational notes because these autists show stereotypical behavior which can only be assessed by observation. The researcher made notes about the attitude of the autists, his activities during conversation, his reaction to any exterior change etc.

The researcher also conducted semi structured interviews of the parents and speech therapist. The aim behind these interviews was to provide more validity to the findings of the research and an in depth understanding of autists' conditions in Pakistan.

The data was collected from November 9, 2015 to January 16, 2016. The duration of recorded conversation was of almost 05 minutes for each student. Total timing of the recorded conversation was about 1 hour 03 minutes and 06 seconds.

#### **Research Ethics:**

The researcher observed the ethics of research while conducting this study and obtained the written approval from the head of institutions for carrying out the study. Moreover, the participants were informed about the purpose of the study. In addition to this, the researcher used pseudo names in order to protect the identity of the speakers (Wray and Bloomer, 2006).

#### **Validity & Reliability:**

Validity and reliability are two important components of research process. The researcher shall try to ensure that the results obtained through data analysis shall render factual and reliable results. For this the researcher shall engage speech therapists to check whether the methodology of present study contains *construct & content* validity. The researcher shall also sought the opinion of other researcher to confirm the *inter-rater reliability* and *internal consistency reliability*.

#### **Methods of Data Analysis**

The researcher employed the model provided by Shriberg, Paul, McSweeney, & Klin (2001) for analyzing the collected data. This model emphasis on the need for analyzing speech at various levels in order to find out prosodic & speech errors. According to this model there are several levels of speech which needed to be analyzed separately.

The researcher shall follow the same model and shall observe the following levels in speech and prosodic analysis.

### Speech Errors

- a. **Volubility:** This will deal with the calculation of total number of words spoken per minute. Moreover, this portion will also explain the different problems which might have damaged have resulted in discontinuity in the speech.
- b. **Severity of involvement:** This section shall include all the errors committed by speakers in producing consonant and vowel sounds.

### Prosodic Errors

- a. **Phrasing:** This section shall include the number of repetitions present in the speech of the autists. The repetition should be measured at the sound, syllable, word, phrase or clause level.
- b. **Rate:** This section shall carry the details about the pauses in the speech and shall also carry information that whether the pauses were short or long. Moreover, the details about the presence of overlaps will also be provided.
- c. **Stress:** In this section the researcher shall provide details about speakers' performance in putting stress on syllables. It shall include information that what sorts of errors were made by speakers in putting stress. For instance, the speakers may shift stress from appropriate to inappropriate words or he may put stress on the words which shouldn't have been stressed.
- d. **Loudness:** This section shall provide information about the tone of the speech that whether it was too soft, moderate or too high.
- e. **Quality:** This section shall provide information about the resonance of the speech. The particular attention will be diverted to see that whether he has nasalized those sounds which shouldn't have been nasalized.

The researcher shall try to find all these patterns in the speech of autists and will also try to explore the differences observed on the basis of age and gender of the autists. Such a comparison will help greatly in finding answers to the research questions. Moreover, few details about personal life, habits and linguistic abilities and observational notes will be provided which help in drawing conclusion and presenting some recommendations.

### Data Analysis

The researcher didn't focus on every utterance rather he used exclusion criteria introduced by Shriberg, Kwaitowski, & Rasmussen (1990). Through this criterion the researcher didn't include any such utterances for analysis which had been effected by other interior or exterior factors, for instance, context/content, environment, register, and states. Such a exclusion criteria was important to employ in order to spend time in analyzing the relevant and useful utterances only.

### Findings, Discussion & Conclusion

The present study has answered following research questions

#### Q.1 What are the segmental and suprasegmental errors present in the speech of autists?

The researcher tried finding answer to this question by checking autists' volubility and severity of involvement. In volubility section the researcher observed that autists are unable to create fluency in their talk. They find difficulties in initiation, continuation and ending of conversation. Following are the details of their difficulties.

1. The autists speak for much less time as compare to the time taken by the speech therapist. There might be different reasons for that. Firstly, autistic children lack social skill of either initiating or sustaining a conversation with others (APA, 1994). That's why their contribution in the conversation was much less than the teacher. Secondly, there was a lot of repetition on the part of teacher. In normal circumstances repetition is done to clarify something but here it was being done to make the students speak who were either hesitant to carry on the conversation or were unable to provide an appropriate answer (Brewer, McBride, Yearley & Slade, 1997).
2. An interesting thing was observed that on their turns the students gave very short and brief replies, in normal circumstances short sentences reply are preferred to longer ones. But here the shorter replies are neither preferred nor dispreferred because they showed lack of interest on the part of autistic children and their desire to quickly bring conversation to its closure (Cook, 1989). There were very less occasion when autists interrupt. According to Ervin-Tripp (1979) 'interruption, simultaneous speech, or overlap' exist in almost 5 percent of the whole conversation. Overlap is one of the important part of normal conversation and it shows the individuals desire to talk (McCarthy, 1991). Here it must be mentioned that speech therapist

and autists have relationships like that of friends, so, interruption was quite expected but least observed. Secondly, overlap is very much systematic in normal people talk, it usually occur near to transition relevance places (Sidnel, 2010) , but as can be observed here, the overlap was not occurring only towards the end of conversations but two turns were going on simultaneously which is very much different from the normal conversation.

3. There were lot of pauses and silences during the conversation. One reason behind pauses and silence may be that students face difficulties in adjusting information to listener's needs (Geller, 1991; Loveland et al., 1990; Perner et al. 1989), or it might indicative of the cognitive difficulties faced by the autistic children in searching appropriate words (Dobbison,1998).

There were plenty of errors observed as far suprasegmental patterns of speech are concerned.

- 1- This study has found pitch variability in children with ASD, However, the study found lot of individual differences which might suggest heterogeneity among ASDs. Thus the findings of the study showed the same patterns as were observed in the study of Baltax et al., 1984 & Chenausky, 2015.
- 2- There were a lot of repetitions on the part of autists which might be owing to disease of echolalia which is a very important diagnostic tool for Autism (APA, 2013).
- 3- There were some problems related to the quality of voice as well. Some autists were found nasalizing sounds which opt not to be nasalized. This change in the quality of speech seemed very odd.
- 4- It was also observed that some autists were speaking in a very low and faint voice while the voice of some others was very pinching and irritating.
- 5- Similarly there were also problems in the observing the rules of putting stress appropriately. Errors were observed in where autists sometimes shifted stress from appropriate to inappropriate syllables (the syllables which shouldn't have been stressed). There were also few instances where unstressed syllables were stressed.

All these findings are similar to what was observed in the study of Port (2015).

#### **What is the impact of age and gender on communicative characteristics of autists?**

Following are the details about the variations in results on the basis of age & gender

##### **Males**

1. Mashhood (4-5 years of age) difficulties in answering, suffered from echolalia. He faced difficulties in many sounds /s/, /k/, /n/, /d/, /r/ & /t/ and replaced /l/ with /a/ sound. Didn't seem to possess knowledge about use of language according to social settings. His voice of clear and was understandable. However there were difficulties in stress pattern as well.
2. Tahir who was of 8-9 years of age showed much problems in speech. There were lot of silences & pauses in the speech & also faced difficulties in the production of vowel sounds /Λ/ and /æ/. The findings of the study also highlighted the fact that he lack social knowledge about carrying on conversation. He had less problem in repletion, there were lot of pauses. His speech was very low and sometimes inaudible. He wasn't good in putting stress on right words. Moreover, he was nasalizing most of the sounds.
3. Adil (15-16 years of age) had same problems as were faced by Tahir apart from use of the word hmmm. He faced problem as he replaces /s/ with /ʃ/. However, he did have some knowledge about the social norms of initiation and ending a conversation. There were pauses but sometimes pause time was lesser than what is expected in normal conversation. His voice was very faint, he did have difficulties in putting stress.

##### **Females**

- 1- Sehrish (4-5 years of age) she faced difficulty in keeping fluency in the speech. She also had problems in the production of /tʃ/ sound. Problems of loudness of voice, stress and pauses was also observed.
- 2- Masooma (8-9) , she faced problems & didn't provide answer to each and every question. She did replace /r/ with /l/ sound. She also had much problems in the production of /d/ sound. Problems were also observed in assigning stress to syllables. Her voice was very much faint some times and it was difficult to hear. However, she wasn't nasalizing sounds.

- 3- Mahrin was 15-16 years of age there were few overlaps when Mahrin was talking about movies, she faced problems with (æ) and the consonant sound /t/ sounds. There was nasalization in her speech and it was very loud and creaky. Stress patterns problems were there. She seemed to possess the social knowledge about imitation and closure of conversation.

As it can be concluded on the basis of above details that there are certain patterns which are more common in the younger adults than the grown-ups. For instance, younger autists do face difficulties due to echolalia but this difficulty was not much pronounced in case of teen aged autists. Similarly, the older autists were more aware but such norms of carrying on conversation which resulted in less suprasegmental errors. However, there wasn't much variation observed on the basis of gender. All the autists faced from different difficulties in adhering to the normal segmental and suprasegmental patterns of speech. A lot of variability was observed in performance of autists, however, no autists was found free from problems in speech.

#### Further studies

The present study has raised some more questions to be answered for the future scholars

- What is vowel inventory of autists in Urdu language?
- What are the patterns of reversibility in consonants of Urdu speaking autists?
- What are the monotonic and sing song like patterns in autists' speech?
- How much difficulties in prosody contributes to autists' pragmatic language deficits?

#### Conclusion:

The results of the study show that autists have atypical patterns as far as segmental and suprasegmental patterns of speech of concerned. Moreover, the study shows that there is some improvement in autists' knowledge about phonetics with the passage of time. However, there wasn't any significant differences observed on the basis of gender. In addition to this, the research showed lot of heterogeneity in autists knowledge about phonetics. So, the researcher recommends that every autists individual should be taken as a unique case and treatment should be advised only after a thorough diagnosis.

#### References

- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition (DSM-5). 2013.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4<sup>th</sup> ed.). Washington, DC: American Psychiatric Association.
- Baltaxe, C. (1984). Use of contrastive stress in normal, aphasic, and autistic children. *Journal of Speech and Hearing Research*, 24, 97-105
- Baltaxe, C., Simmons, J., & Zee, E. (1984). Intonation patterns in normal, autistic and aphasic children. In A. Cohen & M. van de Broecke (Eds.), *Proceedings of the Tenth International Congress of Phonetic Sciences* (pp. 713-718). Dordrecht, The Netherlands: Foris Publications.
- Bonneh, Y. S., Levanon, Y., Dean-Pardo, O., Lossos, L., and Adini, Y. (2011). Abnormal speech spectrum and increased pitch variability in young autistic children. *Frontiers in Human Neuroscience*, 4, 1-7.
- Burns, N. & Grove, S.K. (1998). (3<sup>rd</sup> ed.). *The practice of nursing research: conduct, critique and utilization*. Philadelphia: Saunders.
- Capps, L., Kehres, J., & Signman, M. (1998). Conversational abilities among children with Autism & Children with developmental delays. *Autism*, 2 (4), 44-325.
- Cook, G. (1989). *Discourse*. Oxford: Oxford University Press.
- Chenausky, K.V. (2015). Speech in autism. *Acoustics Today*, 11 (4).
- Creswell, J. W. (1994). *Research design: Qualitative and quantitative approaches*. Thousand Oaks, CA: Sage Publications.
- DeMyer, M., Barton, S., DeMyer, W., Norton, J., Allen, J., & Stelle, R. (1973). Prognosis in autism: A follow-up study. *Journal of Autism and Childhood Schizophrenia*, 3, 199-246.
- Diehl, J.J., Watson, D.G., Bennetto, L., McDonough, J., & Gunlogson, C. (2009). An acoustic analysis of prosody in high-functioning autism. *Applied Psycholinguistics*, 30, 385-404.
- Liamputtong, P. & Ezzy, D. (2005). *Qualitative research methods* (2nd ed.). Oxford University Press, South Melbourne.

- Loveland, K. A., McEvoy, R. E., Tunali, B. & Kelley, M. L. (1990). Narrative story telling in autism and down's syndrome. *British Journal of Developmental Psychology*, 8, 9-23.
- McCarthy, M. (1991). *Discourse analysis for university teachers*. Cambridge: Cambridge University Press.
- Mouton, J. & Marais, H.C. (1992). *Basic concepts in the methodology of the social sciences*. Pretoria: Human Sciences Research Council.
- Myers, M. (2000). Qualitative research and the generalizability question: Standing firm with Proteus. *The Qualitative Report*, 4(3).
- Myers, M.D., & Avison, D.E. (eds.). (2002). *Qualitative research in information systems: A reader*. London: Sage Publications.
- Nelson, K. (1973). Structure and strategy in learning to talk. *Monographs of the Society for Research in Child Development*, 38.
- Nelson, K. (1981). Individual differences in language development: implications for development and language. *Developmental Psychology*, 17, 170–187.
- Ousley, O., & Cermak, T. (2014). Autism Spectrum Disorder: Defining Dimensions and Subgroups. *Curr Dev Disord Rep*. 2014; 1: 20-28.
- Parke, J. & Griffiths, M. D. (2008). Participant and non-participant observation in gambling environments. *Enquire*, 1, 1-18.
- Paslawski, T. (2005). The Clinical Evaluation of Language Fundamentals (CELF-4). *Canadian Journal of School Psychology*, 20(1/2), 129-134.
- Perner, J., Frith, U., Leslie, A. M. & Lukman, S. (1989). Exploration of autistic child's theory of mind: Knowledge, belief, and communication. *Child Development*, 6, 689-700.
- Port, R. (2015). Technical committee report: Speech communication. *Acoustics Today*, 11, 68-71.
- Rapin, I., & Dunn, M. (2003). Update on the language disorders of individuals on the autistic spectrum. *Brain Dev*, 25, 166-172.
- Rutter, M., Maywood, L., & Howlin, P. (1992). Language delay and social development. In P. Sandelowski, M. (2000). Focus on research methods: Whatever happened to Qualitative description? *Research in Nursing and Health*, 23 (4), 334 -340.
- Schopler, E., Van Bourgondien, M.E., Wellman, G.J., & Love, S.R. (2010). *Childhood Autism Rating Scale (2<sup>nd</sup> ed.)*. Los Angeles, CA: Western Psychological Services.
- Sharda, M., Subhadra, T. P., Sahay, S., Nagaraja, C., Singh, L., Mishra, R., Sen, A., Singhal, N., Erickson, D., and Singh, N. C. (2010). Sounds of melody—pitch patterns of speech in autism. *Neuroscience Letters*, 478, 42-45.
- Shriberg L. (1987). Phonological assessment. *Paper presented at the meeting of the Oregon-Washington Regional Speech and Hearing Association*; Seattle: WA.
- Sidnell, J. (2010). *Conversation Analysis: An Introduction*. Chichester: Wiley-Blackwell.
- Silverman, D. (2006). *Interpreting qualitative data (3<sup>rd</sup> ed.)*. London: sage Publications Ltd.
- Simmons, J., & Baltaxe, C. (1975). Language patterns in adolescent autistics. *Journal of Autism and Childhood Schizophrenia*, 5, 333–351.