

Language impairments in individuals with Autism Spectrum Disorder

Franković, Izabela

Undergraduate thesis / Završni rad

2023

Degree Grantor / Ustanova koja je dodijelila akademski / stručni stupanj: **University of Zadar / Sveučilište u Zadru**

Permanent link / Trajna poveznica: <https://urn.nsk.hr/urn:nbn:hr:162:124325>

Rights / Prava: [In copyright](#) / [Zaštićeno autorskim pravom.](#)

Download date / Datum preuzimanja: **2024-05-16**



Sveučilište u Zadru
Universitas Studiorum
Jadertina | 1396 | 2002 |

Repository / Repozitorij:

[University of Zadar Institutional Repository](#)



Sveučilište u Zadru
Odjel za anglistiku
Sveučilišni prijediplomski studij Anglistike

Izabela Franković

**Language impairments in individuals with
Autism Spectrum Disorder**

Završni rad

Zadar, 2023.

Sveučilište u Zadru

Odjel za anglistiku

Preddiplomski sveučilišni studij engleskog jezika i književnosti (dvopredmetni)

Language impairments in individuals with Autism Spectrum Disorder

Završni rad

Student/ica:

Izabela Franković

Mentor/ica:

Doc. dr. sc. Frane Malenica

Zadar, 2023.



Izjava o akademskoj čestitosti

Ja, **Izabela Franković**, ovime izjavljujem da je moj **završni** rad pod naslovom **Language impairments in individuals with Autism Spectrum Disorder** rezultat mogega vlastitog rada, da se temelji na mojim istraživanjima te da se oslanja na izvore i radove navedene u bilješkama i popisu literature. Ni jedan dio mogega rada nije napisan na nedopušten način, odnosno nije prepisan iz necitiranih radova i ne krši bilo čija autorska prava.

Izjavljujem da ni jedan dio ovoga rada nije iskorišten u kojem drugom radu pri bilo kojoj drugoj visokoškolskoj, znanstvenoj, obrazovnoj ili inoj ustanovi.

Sadržaj mogega rada u potpunosti odgovara sadržaju obranjenoga i nakon obrane uređenoga rada.

Zadar, 21. rujna 2023.

TABLE OF CONTENTS

1. INTRODUCTION.....	5
2. THEORIES OF LANGUAGE IMPAIRMENTS IN INDIVIDUALS WITH AUTISM SPECTRUM DISORDER.....	6
2.1. Theory of mind deficit.....	6
2.1.1. Concurrent relationship between theory of mind and language development	7
2.2. Weak central coherence theory	8
2.2.1. The relationship between weak central coherence theory and language comprehension	10
2.3. Executive functioning deficit theory	10
2.4. Pragmatic language impairment theory.....	11
3. LANGUAGE DEVELOPMENT IN INDIVIDUALS WITH AUTISM SPECTRUM DISORDER.....	14
3.1. Acquisition and development of language: early years.....	14
3.2. Specific language characteristics.....	15
3.3. Development of language: later years	15
4. LANGUAGE IMPAIRMENTS IN INDIVIDUALS WITH AUTISM SPECTRUM DISORDER ACROSS DIFFERENT LINGUISTIC DOMAINS.....	17
4.1. Phonology.....	17
4.2. Morphology.....	19
4.3. Syntax.....	20
4.4. Semantics	21
4.5. Pragmatics	21
5. CONCLUSION	24
6. WORKS CITED.....	25
7. THESIS TITLE IN ENGLISH: Summary and key words.....	32
8. NASLOV RADA NA HRVATSKOM JEZIKU: Sažetak i ključne riječi	32

1. INTRODUCTION

Deficits in social interaction and communication are characteristic symptoms of Autism Spectrum Disorder (ASD), where an individual also typically displays repetitive behaviours and has sensory difficulties. In addition to being a neurodevelopmental disorder, it is also a spectrum disorder, meaning that its symptoms vary among individuals, and should be individually addressed to provide them and their families with optimal care and support. ASD is marked by its diverse array of symptoms which affect various aspects of individual's lives, including language and communication. The aim of this paper is to shed light on some of the language impairments which manifest in autistic individuals. The first chapter explores four different theories of language impairments in individuals with ASD to provide a foundation for better understanding of deficits commonly observed within the ASD population. The second chapter then briefly describes the process of language acquisition in autistic individuals, as well as mentions the most prominent difficulties which become more evident as the language develops. The third chapter deals with specific language impairments observed in five different linguistic domains, encompassing phonology, morphology, syntax, semantics, and pragmatics. The final chapter summarizes and concludes all findings from the paper.

2. THEORIES OF LANGUAGE IMPAIRMENTS IN INDIVIDUALS WITH AUTISM SPECTRUM DISORDER

This section of the paper focuses on four theories which help us gain insight into some of the challenges which individuals with ASD encounter. Theory of mind deficit suggests that autistic individuals have difficulties grasping other people's thoughts as well as emotions, impacting their social interactions and communication. Weak central coherence theory highlights autistic's tendency to excessively focus on details of something while struggling to process information in a more holistic manner. This theory explains why individuals with ASD frequently misinterpret the intended meaning and do not see beyond the literal meaning of words. Deficit in executive functioning influences autistic's ability to make decisions, plan and organize tasks, as well as adapt to changes, all of which make their everyday lives challenging, including their academic and social performance. Lastly, pragmatic language impairment theory explains how individuals with ASD have troubles with using language in an effective and appropriate way in social contexts.

2.1. Theory of mind deficit

Premack and Woodruff (1978) were the first ones to introduce the term "Theory of mind" in their study "Does the chimpanzee have a theory of mind?" where they explored if chimpanzees, comparative to humans, are able to ascribe various mental states to themselves and other people. Namely, mental states observed in this study included *purpose* or *intention*, as well as *knowledge*, *belief*, *thinking*, *doubt*, *guessing*, *pretending*, *liking*, and others. It is worth clarifying that the theory of mind acquisition must be viewed solely as a theory since such states, which can also be used as anticipation of another individual's behaviour, cannot be directly observed. Since then, numerous studies have been conducted suggesting that autistic individuals do not employ a theory of mind.

In one of the earliest studies regarding this hypothesis, Baron-Cohen et al. (1985) investigated whether children with ASD have the ability to accurately solve a false belief task. Experimental scenario involved a doll named Sally who placed a marble into a basket which was in front of her, and then exited the room. While she was absent, another doll named Anne took Sally's marble out of her basket and relocated it into her own. Upon Sally's return to the room, the children were prompted with the inquiry, "Where will Sally look for the marble?".

Autistic children kept continually giving the marble's real location instead of predicting the doll's actions based on her belief thus proving the hypothesis.

The failure in the theory of mind acquisition shown by individuals with ASD demonstrates "a cognitive deficit that is largely independent of general intellectual level and has the potential to explain both lack of pretend play and social impairment by virtue of a circumscribed cognitive failure" (Baron-Cohen et al., 1985, p. 44). Documented findings therefore reaffirm the fact that ASD is a developmental disorder, as opposed to it being an intellectual disorder given that there are several autistic individuals whose IQs are either in the normal range or above average.

2.1.1. Concurrent relationship between theory of mind and language development

Developmental disorders are generally associated with deficits in language as well. In instances of typically developing children, employment of theory of mind is interconnected with language development and development of communicative competence which makes distinguishing them one from another challenging. However, language impairments and theory of mind deficits presented in individuals with developmental disorders have been proven useful when trying to demonstrate the ways in which they are related and dependent on each other. When highlighting theory of mind's interaction with language development, it is important to mention several influencing factors such as language exposure, joint attention, employment of mental state terms, individual's overall linguistic ability, and understanding sentence complement structures (Charman et al. 2000).

It has been put forward by several authors that exposing children to talk about mental states in their initial years of life encourages theory of mind development, as it was shown in the research carried out by Ruffman et al. (2002) in which they discovered that children's communicative competence as well as later theory of mind performance were predicted by their mothers' talk about mental states. Dunn et al. (1991) established that interactions within the family, primarily among siblings, are advantageous in the evolution of children's theory of mind.

There is circumstantial evidence that joint attention, a behaviour presented in the earliest stages of communication in which two people engage in interaction by paying attention to a specific object or an event, influences theory of mind performance and language development. Further research on this matter is required to examine whether a direct relationship exists between them (Charman et al., 2000).

Tager-Flusberg (1992) conducted a study where she examined the way in which autistic individuals employ mental state terms and consequently found that they lacked the ability to talk about attention which is congruent with the impairments found in their use of nonverbal cues for joint attention. In addition to terms regarding attention, insufficiencies were shown when talking about cognitive states as well. Tager-Flusberg (1992) analysed mental state terms for desire, perception, and emotion. The findings showed minimal problems when talking about emotion which has already been suggested in some of the previous research stating that “autistic children are able to understand desire and simple emotions but show specific deficits in their knowledge of cognitive or epistemic mental states” (Tager-Flusberg, 1992, p. 162).

It is evident that individual's overall language ability and theory of mind performance are closely linked. Language use is a better indicator of later theory of mind development, unlike vice versa. Features of language development which forecast the way in which theory of mind develops are still ambiguous since certain studies demonstrate a stronger impact of syntax while others indicate a stronger impact of semantics (Miller, 2006).

De Villiers et al. (2000; 2002) pointed out that specific syntactic structures, namely sentence complements, are essential in relation to how theory of mind develops because in order for children to understand false belief, they firstly must understand sentence complement structures. When analysing sentence complement structures, specific verbs allow distinguishing the truth value of the whole sentence from the truth value of the sentence embedded within it. For example, if the children understand that in the sentence complement structure “Lucy thinks the moon is made of green cheese”, the embedded sentence “the moon is made of green cheese” is false, even though the whole sentence can be true, they also understand false belief and will therefore develop theory of mind. However, if the child does not understand that those two parts of the sentence can be understood separately and have contradicting truth values, it can be expected that impairments in understanding false belief and development of theory of mind will arise (Miller, 2006).

2.2. Weak central coherence theory

The term central coherence, introduced by Frith (1989), refers to the integration of information from various sources into one unified whole to process and comprehend received information more efficiently. Bartlett (1933) concluded in his earlier research that an individual, when processing information, “has an overmastering tendency to jump to a general impression, and on the basis of this guesses at the probable detail” (Bartlett, 1933, p. 188). For example,

when one hears a story and later tries to recall or retell it, he will most likely only be able to reproduce the main ideas while failing to remember its surface form.

Frith (1989) found that typically developing children and children with intellectual disabilities were more competent with the processing of meaningful and patterned information but had difficulties in the processing of random and meaningless stimuli. However, children with ASD showed no discrepancies between the two and were able to equally recall both meaningful sentences as well as random word sequences. This is why Frith (1989) put forward the notion that autistic individuals have weak central coherence, a hypothesis supported by Shah's and Frith's (1993) study investigating visuospatial-constructional coherence of autistic individuals on block design tasks.

The present task, created by Kohs (1923, as cited in Shah and Frith, 1993), is the only task on Wechsler intelligence scales which continually shows superior performance of autistic individuals. As described, the task "requires first the breaking up of each design presented into logical units, and second a reasoned manipulation of blocks to reconstruct the original design from separate parts. The results of this activity, it is presumed, yield a fair index of this analytic-synthetic power which we term intelligence" (p. 1352).

It is believed that weak central coherence is the reason why autistic individuals outperform other subjects on block design tasks. The reason for this is the fact that they can see the design broken down even before it has been segmented. Neurotypicals, on the other hand, see the design as a whole and when the design is pre-segmented it greatly improves their performance on the task. Individuals with ASD do not consider segmentation of the design beforehand as helpful (Shah and Frith, 1993).

Since individuals with ASD are unable to integrate information into whole units, it can be anticipated that they would also have difficulties with perceptual coherence which is the ability of integrating various sensory inputs into coherent wholes as to perceive and understand the world. This notion was explored using standard visual illusions, one of them being the *Titchener Circles*, where individuals with ASD were harder to deceive because they were able to distinguish shapes better than non-autistic individuals, thus proving their fragmented perception.

2.2.1. The relationship between weak central coherence theory and language comprehension

Weak central coherence theory is also thought to be useful when trying to understand impairments found in language comprehension and production of autistic children (Pellicano, 2011). This is because language comprehension encompasses several different components over various domains to eventually bring out meaning, namely, combining linguistic content, nonverbal communication, and contextual information (Weismer et al., 2016). Even though there is conflicting evidence, Frith's (1989) original weak central coherence theory supports the proposition that impairments in contextual integration would lead to difficulties with language comprehension in individuals with ASD.

Another language impairment is found within verbal-semantic coherence which refers to connections between various words, concepts, and ideas presented within a language. It helps facilitate concise and meaningful language, enabling comprehension and providing effective communication of intended information. For communication to be effective, it largely depends on verbal-semantic coherence.

Hermelin and O'Connor (1967), as well as several other researchers, suggested that individuals with ASD do not employ semantic or grammatical relations to make sense of given sentences. Frith and Snowling (1983) explored whether individuals with ASD would take in to the account the context of a sentence in an effort to distinguish meanings and pronunciations of homographs presented before them. They found, and at the same time proving the hypothesis, that other words in the sentence were of no help for individuals with ASD. However, Snowling and Frith (1986) observed, when it comes to autistic children, that they actually are able to pay attention to the context of the sentence, but only if they are told it is obligatory. This has been proven in their research where children with ASD had similar results as the other subjects after they had been informed to concentrate on the meaning.

Frith (1989) proposed that weak central coherence causes several symptoms presented in autism. Because individuals with ASD are impaired in integrating information into meaningful wholes, they experience difficulties in the social settings; often misinterpreting social situations and interactions.

2.3. Executive functioning deficit theory

Several autistic individuals are impaired in the domain of executive functioning which is not considered a typical feature of ASD since there are also a number of individuals who do

not exhibit impairments in the executive function domains due to their individual differences. These domains include shifting, inhibition, and working memory.

Shifting, also known as cognitive flexibility, allows individuals to shift between mental states or tasks. Inhibition enables individuals to disregard any information which may be conflicting with the current task. Planning is a more complex cognitive function which allows individuals to adapt and modify their pre-planned actions in accordance with new received information.

When it comes to executive functioning's relationship with language, Hierarchical Competing Systems Model (HCSM) is generally applied (Marcovitch, 2009). This model consists of two systems which are in hierarchy, namely, a habit system and a representational system. Past experiences of individuals affect the former, while mindful reflections of one's behaviours influence the latter. Those two systems work together and govern behaviour directed at completing a certain task or a goal. "While the habit system may lead an individual to be influenced by perceptual information, the representational system, or language-guided reflection, overrides perceptually driven behaviours in favour of more mature goal-directed behaviour" (Friedman, 2019, p. 296).

Executive function is related to language in terms of vocabulary, syntax, and pragmatic language. Expressive and receptive vocabulary are essential in the performance of executive function in young children. Expressive language serves for individuals to express their thoughts and emotions through words and sentences, while receptive vocabulary allows individuals to understand what has been uttered to them by another speaker (Cascia and Barr, 2017).

Cascia and Barr (2017) explored if impairments in executive function and vocabulary affect empathy in individuals with ASD and found that both are prerequisite skills for its development. They concluded that executive functioning skills and vocabulary competence are interconnected and influence social interactions. Haebig et al. (2015) similarly proposed that there is a connection between executive function and language, saying that executive functioning skills affect the lexical processing of individuals. Furthermore, following the HCSM, it has been proposed that syntactic skills of individuals also influence executive functioning performance.

2.4. Pragmatic language impairment theory

Pragmatic language impairment (PLI) was firstly introduced by Rapin and Allen (1983). Since there are many occurrences where symptoms of PLI and ASD overlap, numerous

clinicians have proposed that PLI should be classified into the spectrum of autism disorders. However, when diagnosing individuals by following the DSM-5¹ criteria, one must show impairments in PLI along with other ASD symptoms and only then can get a diagnosis of ASD. If there are only symptoms of PLI, without symptoms such as repetitive behaviour, difficulties when navigating the social world as well as special interests, then one is diagnosed exclusively with PLI. In this section, overlapping symptoms of PLI and ASD will be discussed, the first one being the use of communication to socialize.

Schuler et al. (1997) mentions requesting or protesting, which belong to the category of behavioural regulation, then initiating, responding, maintaining or ending social interactions, which belong to social interaction, and joint attention as being some of the communicative intents children must acquire in order to successfully participate in the social world.

Willcox and Mogford Bevan (1995) observed the communication intent of requesting and found that children diagnosed with PLI make requests which may, to other speakers, come across as excessively formal. In addition, they often start conversations by asking numerous questions and by providing unsolicited statements.

Another overlapping symptom of PLI and ASD is individual's ability of being aware of the context in which the interaction occurs. It is important to adapt one's speech after understanding what the other speaker is uttering and assessing the context of the situation in which the conversation takes place. Subsequently, children with PLI have difficulties with comprehension of contextual cues which frequently lead to them unintentionally offending their conversational partners (Ketelaars et al., 2017).

Children with PLI and ASD have impaired skills which are necessary for effective narrative discourse. Those skills are a direct indicator of individual's development regarding syntax and storytelling. Constructing a narrative encompasses both semantic and syntactic skills as well as being able to logically organize information and modify one's narrative to be suitable to the listener's needs (Losh and Capps, 2003). Children with PLI and ASD frequently provide their listeners with scarce information about a particular topic accompanied by irrelevant and incoherent utterances which often leads to difficulties in understanding the main idea of the story (Ketelaars et al., 2017).

Understanding implicit language is another overlapping symptom in individuals with PLI and ASD. A crucial aspect of effective communication is the ability to comprehend implied

¹ Diagnostic and Statistical Manual of Mental Disorders, 5th Edition

meanings by paying attention to intonation, context and facial expressions. It is related to the comprehension of idioms and words with more than one meaning, both of which are noticed in children with PLI and ASD.

3. LANGUAGE DEVELOPMENT IN INDIVIDUALS WITH AUTISM SPECTRUM DISORDER

The following section of the paper describes the way in which children with ASD develop language and acquire communicative skills from an early age to later school years. During this time, some distinct language characteristics appear, such as pronoun reversal, echolalia, and difficulties with prosody.

3.1. Acquisition and development of language: early years

Some of the earliest manifestations of ASD, presented in the child's first year of life, are a failure to show an affinity towards certain people and an absence of reactions to social stimuli. They occur even before a child starts using language as a communication tool and they point to the existence of a fundamental issue in communication (Ozonoff et al., 2010). Autistic children start communicating in the latter half of the first year, but only with the intention of influencing others to do or not do specific actions, instead of communicating with the aim of social interaction. Following from the former part of the first year, autistic children persist in displaying disinterest in people as well as objects from their immediate environment (Barbaro and Dissanayake, 2013).

Throughout their second year of life, autistic children usually stop responding to voices and fail to utter their first recognizable words. They may also acquire a limited vocabulary and not expand it any further, or they may lose the entirety of vocabulary which they have accumulated thus far (Bradley et al., 2016).

From third to fifth year, when typically developing children start combining words into logical grammatical forms, autistic children follow similar pathways of language acquisition which match their mental age, with slight delays and deficits (Tager-Flusberg et al., 1990). In contrast, a handful of children on the autism spectrum diagnosed with Asperger syndrome show zero delays and deficits. Generally, they even obtain their linguistic knowledge before the expected age, while showing typical intellectual development. They do, however, struggle with socializing and using their language skills in interactions. This shows that in order to be diagnosed with ASD, one's language acquisition does not necessarily have to be delayed. It is of greater importance to look into fundamental communicative impairments noticed in non-verbal communication and articulation (Boucher, 2012).

3.2. Specific language characteristics

Certain language characteristics appear when autistic children start talking, such as pronoun reversal, echolalia, and difficulties with prosody.

Pronoun reversal is an instance in which a child uses 'I' for 'you' and/or 'you' for 'I'. This shows how an autistic child struggles with the perception of self and others and has difficulties with understanding speaker and hearer roles people have in communication (Tager-Flusberg, 2000). This has been proven by a study on joint attention and language development in autistic individuals where a positive correlation was observed between the correct usage of 'I' and 'you' pronouns and initiating joint attention with the help of gestures, meaning that the ability to know the difference between these two pronouns is related to understanding of social interactions (Loveland and Landry, 1986).

Echolalia, initially discovered by Kanner (1943), refers to the repetition of words and phrases commonly seen in autistic individuals. It can be immediate or delayed. Most frequently, the words and phrases repeated by the child are the ones whose meaning the child does not understand or does not know how to give an appropriate response to. Echolalia is not exclusive to ASD and its use reduces as the child's expressive ability develops (Paul, 2019). Fay (1973), along with a number of other authors, proposed that children with ASD use echolalia in order to communicate because they have difficulties with maintaining the natural progression of a conversation. On account of this, echolalia serves a purpose in acquisition and development of language by allowing autistic individuals to take part in and maintain social interactions (Rydell and Mirenda, 1994).

Autistic children are also impaired in their prosodic abilities, namely vocal quality, intonation, and stress patterns (Rutter et al., 1992). One study suggests that prosodic impairments could be detected even before an autistic child starts talking. Comparing infants who were at a greater risk of developing ASD to those who had a decreased risk, authors found that high-risk infant's cries were more high-pitched, and they were prone to changes in frequency (Sheinkopf et al., 2012). When it comes to intonation, autistic children generally display monotone speech, however, there is also a group of individuals exhibiting either a rhythmic and melodic intonation or elevated pitch (Diehl and Paul, 2012).

3.3. Development of language: later years

As children with ASD reach school age and adolescent years, their language continues to develop. Autistic individuals whose IQs are in the normal range usually possess broad

vocabularies and tend to use extensively formal and correct language because of which they are often referred to as “little professors” (Paul, 2019). Even though some of them have a vast knowledge of language forms, individuals with ASD still have difficulties with comprehension and the use of language within social situations (Stone and Caro, 1990).

4. LANGUAGE IMPAIRMENTS IN INDIVIDUALS WITH AUTISM SPECTRUM DISORDER ACROSS DIFFERENT LINGUISTIC DOMAINS

The following section of the paper examines impairments of individuals with ASD in areas of phonology, morphology, syntax, semantics, and pragmatics. There exists a paucity of studies which comprehensively investigate these linguistic domains and provide a more thorough understanding of language use in autistic individuals. That is why researches continuously encourage further exploration of this topic. It is important to emphasize that impairments in these domains are not mutually exclusive and can vary immensely among individuals.

4.1. Phonology

Throughout the history, insufficient attention has been given to detailed analyses of speech sound impairments in autistic children. Recently, however, more and more studies researching phonological skills of children with ASD have started to emerge which will be discussed further in the text. Before delving into the findings of some of the most interesting and relevant studies regarding this topic, it is notable to mention that one of the reasons for the scarcity of previous research are the challenges with which researches are faced when working with children with ASD. For instance, the collection of data may pose a problem because of obsessive or repetitive behaviours or if children do not want to engage with the examiners. Children may obsessively repeat words and phrases upon hearing them, a behaviour known as echolalia, instead of focusing on uttering the target word. They frequently use jargon, incomprehensible words, produce vehement noises, and try to verbally stimulate themselves, all of which hinder phonemic transcriptions and data analyses (Wolk et al., 2016).

One of the earliest studies providing detailed investigation of a phonological system is that of Wolk and Edwards (1993), a case study involving an 8-year-old autistic boy, where they concluded that he had a distinct way of developing his phonological system. As typically developing children are learning how to talk, several phonological processes which serve as simplifications and modifications are involved so that children can more easily pronounce certain words and phrases. As they get older and gain more language skills, those processes start disappearing over time.

Phonological processes which were observed in this study and do not usually occur in typically developing children are omission of marked element in /s/ cluster reduction, glottal

replacement, and segment coalescence. Examples from the data for /s/ cluster reduction were words sled /sled/, snake /sneɪk/, and spoon /spu:n/ which he, respectively, pronounced as [zʌ], [zʌ], and [bu]. In the first example /s/ is followed by a liquid consonant /l/ and in the second example by a nasal consonant /n/, both of which contributed to the fact that /s/ was retained (appearing as its voiced counterpart). This is highly unusual for consonant clusters, since typically developing children usually omit /s/ sounds from consonant clusters, as shown in the final example. Glottal replacement refers to a phonological process where a consonant gets substituted by a glottal stop /ʔ/. The examples included words sleeping /sli:pɪŋ/, butter /bʌtə/, and jelly /dʒeli/ which he, respectively, pronounced as [wɪʔi], [bʌʔə], and [dzʌʔi]. Lastly, he exhibited segment coalescence. A phonological process in which two different consonants merge into a new sound similar to both. In this case, he often produced a voiceless labial-velar glide in instances of clusters containing a voiceless obstruent and either a liquid or a glide, meaning that he would pronounce words like swing /swɪŋ/, fruit /fru:t/, and spring /sprɪŋ/ as [wɪn], [wu], and [wi] (Wolk and Edwards, 1993).

The subject also exhibited several phonological processes which occur in typically developing children, with some of them persisting beyond the expected duration. “Chronological mismatch” (Grunwell, 1981) and extensive incorporation of homonymy were detected. The former refers to the phenomenon in which a child belatedly produces sound changes which had to be present earlier in the development and continue to exhibit certain speech errors after they have passed the age in which they had to be resolved. The latter refers to words which have different meanings but have identical pronunciations. The boy from this study extensively used homonyms in his speech which contributed to difficulties with coherent speaking.

Having analysed his phonological system, authors suggested that “the most plausible explanation is a common underlying neurolinguistic substrate for both phonology and language skills” (Wolk and Edwards, 1993, p. 174). They postulated that autistic children do not develop their phonological system correspondingly to typically developing children because of their inclination to engage in solitary activities and to distance themselves from social situations. Because of their impairments, they might not perceive contrasting phonemes and might have difficulties with connecting sounds to produce meaning.

Since this was a case study, findings are not to be generalized to the entire population of autistic individuals. However, the acquired data of each single case study helps us to gain even more insight in Autism Spectrum Disorder which is why further research is encouraged.

4.2. Morphology

Several studies observing grammatical morphology in children with ASD have been conducted thus far, however, they must be interpreted carefully since most of them included a small number of participants who differed in their chronological and mental ages as well as in their linguistic abilities.

Bartolucci et al. (1980) conducted a study on grammatical morphemes comparing typically developing children, children with intellectual disabilities, and children with ASD. They found that autistic children frequently tend to exclude morphemes such as articles (a, the), auxiliary and copula verbs, past tense, third person present tense, and present progressive. They argued that autistic individuals exhibit "an atypical development of morphological features" which is "best seen as further evidence of a defect superimposed to a global delay in acquisition" (Bartolucci et al., 1980, p. 47).

Bartolucci and Albers (1974) carried out pilot research regarding the production of tense markers comparing typically developing children, intellectually disabled, and autistic children. They discovered that children with ASD made substantially more mistakes in production of past tenses in comparison to other two groups. The results on the production of present tense were evenly matched. They concluded that autistic's inability to produce past tense must be characteristic to their group. Upon further analysis, they excluded the possibility that autistic children cannot produce past tense markers because they might be impaired phonetically and could not be able to perceive them. This was dismissed because when children with ASD heard past tenses, they were able to repeat them correctly (Bartolucci and Albers, 1974).

Roberts et al. (2004) emulated previously mentioned research in their study which included 60 children with ASD. Their goal was to get a more comprehensive understanding of language characteristics in autistic individuals while simultaneously trying to compare those impairments with those shown in children with specific language impairments (SLI). They found that children with ASD regularly omit third-person singular and past tense verbs, while also exhibiting some distinctive error patterns such as echolalia and tendency to fixate on preceding responses. Children with ASD also frequently gave irrelevant and unrelated responses on both probes which included recurrent use of present continuous tense, *-ing*. They concluded that autistic children have similar grammatical impairments as children with SLI and authors encourage further research on this matter.

4.3. Syntax

Few studies on autistic individuals' syntactic abilities have been conducted thus far, most of which are not systematic and comprehensive, and use only certain parts of syntax in order to measure children's language with the focus on semantics and pragmatics. Pierce and Bartolucci (1977), however, conducted a study where they investigated syntax which serves as a foundation for further analysis of the whole language system in children with ASD. Subjects included autistic children, intellectually disabled, and typically developing children who were matched based on their mental age. Findings showed discrepancies in syntactic abilities of autistic children in opposition to typically developing children, whereas the differences pertaining to intellectually disabled children were negligible. Tager-Flusberg (1981) suggested that syntactic development in children with ASD is not so different to that of typically developing children, it is just hindered. Phonological, semantic, and pragmatic development in autistic individuals have similar delays as well. "This pattern of language development suggests that the various aspects of language that are functioning at different levels in autism are relatively independent of one another and may be based on different underlying skills" (Tager-Flusberg, 1981, p. 53).

Bartak et al. (1975) wanted to find out which language impairments are exclusive to ASD, and which are common in all language disabilities by comparing children with ASD and developmental aphasic children to test the hypothesis that infantile autism develops due to the existence of specific language deficits. Findings revealed that children with ASD "had a more deviant language development than non-autistic children, had a more severe comprehension deficit, had a more extensive language disability (in that it involved several different modalities), and also showed a defect in the social usage of the language they possessed" (Bartak et al, 1975, p. 142). They concluded that language comprehension deficits are not sufficient for the development of infantile autism, but they can contribute to the development of distinctive behavioural patterns like those commonly observed in individuals with ASD.

As Paul and Cohen (1984) suggest, language development in autistic children reaches a plateau at a certain point, which can be seen in some studies of adults with ASD. When testing syntactic production in free speech, adults with ASD had considerably worse results in comparison to adults who had intellectual disabilities.

4.4. Semantics

Like previous linguistic domains, there is very little research on development of semantics in autistic individuals. This should certainly be changed in the future since it is suggested in various diagnostic assessments that autistic children show distinct deviations when it comes to their information processing abilities. For instance, Hermelin and O'Connor (1967) discovered that children with ASD, in comparison to typically developing and intellectually disabled children, do not use meaning as a tool for organizing utterances in semantic categories in situations where they must recall given material.

Simmons and Baltaxe (1975) semantically analysed speech production of adolescents with ASD. The most common mistakes made by autistic adolescents in this study were violations of rules that govern the meaning of words, phrases, and sentences, i.e., semantic constraints, as well as displaying atypical patterns in prosody. Even though this study lacked the control group to which these findings could be compared to, authors established that autistic individuals exhibit language impairments specifically affecting their semantic development.

According to Ricks and Wing (1976), children with ASD who know some language can identify or refer to specific objects, notions, or entities in communication and encounter zero problems with simple concepts, meaning that they can learn and develop extensive vocabulary and have satisfactory results on tests. This indicates the existence of an impairment in their ability to understand and conceptualize information. Authors explain that there “appears to be a specific difficulty in handling symbols, which affect language, nonverbal communication, and many other aspects of cognitive and social activity” (Ricks and Wing, 1976, p. 214).

Autistic children face challenges with organizing verbal symbols in accordance with grammatical rules. This reconfirms Hermelin and O'Connor's (1967) finding that children with ASD are not able to classify words in the same semantic categories. Even though more research is certainly needed to gain more insight into autistic's semantic functioning, it can be concluded at this moment that autistic children have difficulties in certain areas of semantic processing, which is most likely caused by cognitive impairments in higher-level conceptualization.

4.5. Pragmatics

There are several studies dealing with various aspects of pragmatics and no studies which comprehensively cover the whole domain. Baltaxe (1977) was one of the first authors who conducted a study investigating pragmatic skills of autistic individuals, namely, adolescents. She found that autistic individuals have difficulties with assuming their roles in

communication. When converting to a speaker position, individuals with ASD tend to stay in the hearer perspective and report information which they previously received. The reason for this might lie in their unawareness of communicative context.

Another impairment Baltaxe (1977) discovered is that individuals with ASD frequently violate acceptability and politeness conversational postulates because of which they often appear as rude. However, based on observing their complete behaviour it is unlikely that their intention was to be disrespectful towards another speaker. A substantiated explanation for those kinds of utterances stems from their inability to detect the context in which conversation takes place due to their social impairments. It may also be “related to the autistic person’s withdrawal and general aloofness and his or her possible inattention to the total dialogue situation in which such variables appear to be learned” (Baltaxe, 1977, p. 179).

The last impairment the author observed was that individuals with ASD were not drawing distinctions by using specific syntactic devices between old and new information.

Hurting, Ensrud, and Tomblin (1982) investigated the way in which autistic children use questions in discourse. They found that they were unable to carry on a conversation if they were not prompted with a question from their listeners. Authors also observed that children with ASD mostly use questions as a tool for starting and maintaining conversation. The fact that autistic children were familiar with answers to the questions beforehand suggests their misunderstanding of the purpose of asking questions. Following from these findings, authors concluded that “it is likely that these children have a rudimentary pragmatic competence but may lack a more sophisticated knowledge of topical coherence” (Hurting, Ensrud, and Tomblin, 1982, p. 68).

After looking into findings of all five linguistic domains, it can be concluded that autistic individuals seem to acquire multiple phonological processes which typically developing children acquire, some of which persist beyond the expected age. However, the existence of several distinctive phonological processes was also observed, indicating that individuals with ASD develop their phonological system in a unique way. Morphological research shows that autistic individuals tend to omit certain grammatical elements and have difficulties with producing past tense. Their syntactic development is delayed as opposed to typically developing children, and they demonstrate comprehension deficits. Individuals with ASD do not use semantic categories to help themselves recall specific information, they violate semantic constraints and have difficulties with semantic processing. Lastly, pragmatic impairments

observed in autistic individuals include their unawareness of communicative context, violations of communicative postulates, and inability to distinguish between old and new information.

5. CONCLUSION

In conclusion, the purpose of this paper was to demonstrate language impairments in individuals with ASD. The exploration of four deficit theories and observation of language acquisition and development in autistic individuals were crucial for laying the groundwork for a better understanding of language impairments across five different linguistic domains. Observed impairments can affect speech production, vocabulary acquisition, grammatical structure, semantic understanding, and pragmatic language use. These impairments are not mutually exclusive and can impact multiple aspects of autistic individual's lives.

Because this is such an extensive subject, further research which would delve deeper into the complexities of language impairments in autistic individuals is needed and greatly encouraged. In the meantime, research accumulated thus far helps expand our understanding of language impairments in ASD and hopefully promotes support and acceptance of autistic individuals as well as contributes to the fostering of their inclusivity.

6. WORKS CITED

- Baltaxe, C. A. M. (1977). Pragmatic Deficits in the Language of Autistic Adolescents. *Journal of Pediatric Psychology*, 2(4), 176–180. doi:10.1093/jpepsy/2.4.176.
- Barbaro, J., & Dissanayake, C. (2012). Early markers of autism spectrum disorders in infants and toddlers prospectively identified in the Social Attention and Communication Study. *Autism*, 17(1), 64–86. doi:10.1177/1362361312442597.
- Baron-Cohen, S. (1991). Do People with Autism Understand What Causes Emotion? *Child Development*, 62(2), 385–395. doi:10.2307/1131011.
- Baron-Cohen, S., Leslie, A. M., & Frith, U. (1985). Does the autistic child have a “theory of mind”? *Cognition*, 21(1), 37–46. doi:10.1016/0010-0277(85)90022-8.
- Bartak, L., Rutter, M., & Cox, A. (1975). A Comparative Study of Infantile Autism and Specific Developmental Receptive Language Disorder: I. *The Children. The British Journal of Psychiatry*, 126(2), 127–145. doi:10.1192/bjp.126.2.127.
- Bartlett, F. C., & Burt, C. (1933). Remembering: a study in experimental and social psychology. *British Journal of Educational Psychology*, 3(2), 187–192. doi:10.1111/j.2044-8279.1933.tb02913.x.
- Bartolucci, G., & Albers, R. J. (1974). Deictic categories in the language of autistic children. *Journal of Autism and Childhood Schizophrenia*, 4(2), 131–141. doi:10.1007/bf02105366.
- Bartolucci, G., Pierce, S. J., & Streiner, D. (1980). Cross-sectional studies of grammatical morphemes in autistic and mentally retarded children. *Journal of Autism and Developmental Disorders*, 10(1), 39–50. doi:10.1007/bf02408431.
- Boucher, J. (2012). Research Review: Structural language in autistic spectrum disorder - characteristics and causes. *Journal of Child Psychology and Psychiatry*, 53(3), 219–233. doi:10.1111/j.1469-7610.2011.02508.x.

- Bradley, C. C., Boan, A. D., Cohen, A. P., Charles, J. M., & Carpenter, L. A. (2016). Reported History of Developmental Regression and Restricted, Repetitive Behaviors in Children with Autism Spectrum Disorders. *Journal of Developmental & Behavioral Pediatrics*, 37(6), 451–456. doi:10.1097/dbp.0000000000000316.
- Cascia, J., & Barr, J. J. (2016). Associations Among Vocabulary, Executive Function Skills and Empathy in Individuals with Autism Spectrum Disorder. *Journal of Applied Research in Intellectual Disabilities*, 30(4), 627–637. doi:10.1111/jar.12257.
- Charman, T., Baron-Cohen, S., Swettenham, J., Baird, G., Cox, A., & Drew, A. (2000). Testing joint attention, imitation, and play as infancy precursors to language and theory of mind. *Cognitive Development*, 15(4), 481–498. doi:10.1016/s0885-2014(01)00037-5.
- de Villiers, J. G., & de Villiers, P. A. (2000). Linguistic determinism and the understanding of false beliefs. In P. Mitchell & K. Riggs (Eds.), *Children's reasoning and the mind* (pp. 191–228). Hove, United Kingdom: Psychology Press.
- de Villiers, J. G., & Pyers, J. E. (2002). Complements to cognition: A longitudinal study of the relationship between complex syntax and false-belief-understanding. *Cognitive Development*, 17, 1037–1060.
- Diehl, J. J., & Paul, R. (2012). Acoustic differences in the imitation of prosodic patterns in children with autism spectrum disorders. *Research in Autism Spectrum Disorders*, 6(1), 123–134. doi:10.1016/j.rasd.2011.03.012.
- Dunn, J., Brown, J., Slomkowski, C., Tesla, C., & Youngblade, L. (1991). Young Children's Understanding of Other People's Feelings and Beliefs: Individual Differences and Their Antecedents. *Child Development*, 62(6), 1352–1366. doi:10.2307/1130811.
- Ellis Weismer, S., Haebig, E., Edwards, J., Saffran, J., & Venker, C. E. (2016). Lexical Processing in Toddlers with ASD: Does Weak Central Coherence Play a Role? *Journal*

- of Autism and Developmental Disorders*, 46(12), 3755–3769. doi:10.1007/s10803-016-2926-y.
- Fay, W. H. (1973). On the Echolalia of the Blind and of the Autistic Child. *Journal of Speech and Hearing Disorders*, 38(4), 478. doi:10.1044/jshd.3804.478.
- Friedman, L., & Sterling, A. (2019). A Review of Language, Executive Function, and Intervention in Autism Spectrum Disorder. *Seminars in Speech and Language*, 40(04), 291–304. doi:10.1055/s-0039-1692964.
- Frith U. (1989). Autism: explaining the enigma. *Oxford: Basil Blackwell*.
- Frith, U., & Snowling, M. (1983). Reading for meaning and reading for sound in autistic and dyslexic children. *British Journal of Developmental Psychology*, 1(4), 329–342. doi:10.1111/j.2044-835x.1983.tb00906.x.
- Grunwell, P. (1981). The Nature of Phonological Disability in Children. *New York: Academic Press*.
- Haebig, E., Kaushanskaya, M., & Ellis Weismer, S. (2015). Lexical Processing in School-Age Children with Autism Spectrum Disorder and Children with Specific Language Impairment: The Role of Semantics. *Journal of Autism and Developmental Disorders*, 45(12), 4109–4123. doi:10.1007/s10803-015-2534-2.
- Happé, F. G. E. (1996). Studying Weak Central Coherence at Low Levels: Children with Autism do not Succumb to Visual Illusions. *A Research Note. Journal of Child Psychology and Psychiatry*, 37(7), 873–877. doi:10.1111/j.1469-7610.1996.tb01483.x.
- Hermelin, B., & O'Connor, N. (1967). Remembering of words by psychotic and subnormal children. *British journal of psychology*, 58(3-4), 213–218. doi:10.1111/j.2044-8295.1967.Tb01075.X.

- Hurtig, R., Ensrud, S., & Tomblin, J. B. (1982). The communicative function of question production in autistic children. *Journal of Autism and Developmental Disorders*, 12(1), 57–69. doi:10.1007/bf01531674.
- Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous Child*, 2, 217-250.
- Ketelaars, M. P., & Embrechts, M. T. J. A. (2017). Pragmatic Language Impairment. *Research in Clinical Pragmatics*, 29–57. doi:10.1007/978-3-319-47489-2_2.
- Kohs, S C. (1923). Intelligence measurement. New York: Macmillan.
- Loveland, K. A., & Landry, S. H. (1986). Joint attention and language in autism and developmental language delay. *Journal of Autism and Developmental Disorders*, 16(3), 335–349. doi:10.1007/bf01531663.
- Losh, M., & Capps, L. (2003). Narrative ability in high-functioning children with autism or Asperger's syndrome. *Journal of Autism and Developmental Disorders*, 33(3), 239–251. doi:10.1023/a:1024446215446.
- Marcovitch, S., & Zelazo, P. D. (2009). A hierarchical competing systems model of the emergence and early development of executive function. *Developmental Science*, 12(1), 1–18. doi:10.1111/j.1467-7687.2008.00754.x.
- Miller, C. A. (2006). Developmental Relationships Between Language and Theory of Mind. *American Journal of Speech-Language Pathology*, 15(2), 142. doi:10.1044/1058-0360(2006/014).
- Ozonoff, S., Iosif, A., Baguio, F., Cook, I., Hill, M., Hutman, T. (2010). A prospective study of the emergence of early behavioral signs of autism. *Journal of the American Academy of Child & Adolescent Psychiatry*, 49, 256–266.
- Paul, R., & Cohen, D. J. (1984). Responses to contingent queries in adults with mental retardation and pervasive developmental disorders. *Applied Psycholinguistics*, 5(04), 349. doi:10.1017/s0142716400005221.

- Paul, R. (2019). Communication and its development in autism spectrum disorders. *Autism and Pervasive Developmental Disorders*, 129–156. doi:10.1017/cbo9780511544446.005.
- Pellicano, E. (n.d.). Psychological models of autism: an overview. *Researching the Autism Spectrum*, 219–265. doi:10.1017/cbo9780511973918.010.
- Pierce, S., & Bartolucci, G. (1977). A syntactic investigation of verbal autistic, mentally retarded, and normal children. *Journal of Autism and Childhood Schizophrenia*, 7(2), 121–134. doi:10.1007/bf01537724.
- Premack, D., & Woodruff, G. (1978). *Does the chimpanzee have a theory of mind?* *Behavioral and Brain Sciences*, 1(04), 515. doi:10.1017/s0140525x00076512.
- Rapin, I., & Allen, D. (1983). Developmental language disorders: Nosologic considerations. In U. Kirk (Ed.), *Neuropsychology of language, reading, and spelling* (pp. 155–184). New York: Academic Press.
- Ricks, D. M., & Wing, L. (1975). Language, communication, and the use of symbols in normal and autistic children. *Journal of Autism and Childhood Schizophrenia*, 5(3), 191–221. doi:10.1007/bf01538152.
- Roberts, J. A., Rice, M. L., & Tager-Flusberg, H. (2004). Tense marking in children with autism. *Applied Psycholinguistics*, 25(03). doi:10.1017/s0142716404001201.
- Ruffman, T., Slade, L., & Crowe, E. (2002). The Relation between Children's and Mother's Mental State Language and Theory-of-Mind Understanding. *Child Development*, 73(3), 734–751. doi:10.1111/1467-8624.00435.
- Rutter, M., Mawhood, L., & Howlin, P. (1992). Language delay and social development. In: P. Fletcher & D. Hall (Eds.), *Specific speech and language disorders in children: Correlates, characteristics and outcomes* (pp. 63–78). London: Whurr Publishers.

- Rydell, P. J., & Mirenda, P. (1994). Effects of high and low constraint utterances on the production of immediate and delayed echolalia in young children with autism. *Journal of Autism and Developmental Disorders*, 24(6), 719–735. doi:10.1007/bf02172282.
- Schuler, A. L., Prizant, B. M., & Wetherby, A. M. (1997). Enhancing language and communication development: Prelinguistic approaches. In D. J. Cohen & F. R. Volkmar (Eds.), *Handbook of autism and pervasive developmental disorders (Second ed.)*. New York: Wiley.
- Shah, A., & Frith, U. (1993). Why Do Autistic Individuals Show Superior Performance on the Block Design Task? *Journal of Child Psychology and Psychiatry*, 34(8), 1351–1364. doi:10.1111/j.1469-7610.1993.tb02095.x.
- Simmons, J. Q., & Baltaxe, C. (1975). Language patterns of adolescent autistics. *Journal of Autism and Childhood Schizophrenia*, 5(4), 333–351. doi:10.1007/bf01540680.
- Snowling, M., & Frith, U. (1986). Comprehension in “hyperlexic” readers. *Journal of Experimental Child Psychology*, 42(3), 392–415. doi:10.1016/0022-0965(86)90033-0.
- Stone, W. L., & Caro-Martinez, L. M. (1990). Naturalistic observations of spontaneous communication in autistic children. *Journal of Autism and Developmental Disorders*, 20(4), 437–453. doi:10.1007/bf02216051.
- Tager-Flusberg, H. (1992). *Autistic Children’s Talk about Psychological States: Deficits in the Early Acquisition of a Theory of Mind*. *Child Development*, 63(1), 161. doi:10.2307/1130910.
- Tager-Flusberg, H., Calkins, S., Nolin, T., Baumberger, T., Anderson, M., & Chadwick-Dias, A. (1990). A longitudinal study of language acquisition in autistic and down syndrome children. *Journal of Autism and Developmental Disorders*, 20(1), 1–21. doi:10.1007/bf02206853.

- Tager-Flusberg, H. (1981). On the nature of linguistic functioning in early infantile autism. *Journal of Autism and Developmental Disorders*, 11(1), 45–56. doi:10.1007/bf01531340.
- Tager-Flusberg, H. (2000). Understanding the language and communicative impairments in autism. *International Review of Research in Mental Retardation*, 185–205. doi:10.1016/s0074-7750(00)80011-7.
- Willcox, A. H. E., & Mogford-Bevan, K. (1995). Assessing conversational disability. *Clinical Linguistics & Phonetics*, 9(3), 235–254. doi:10.3109/02699209508985335.
- Wolk, L., & Edwards, M. L. (1993). The emerging phonological system of an autistic child. *Journal of Communication Disorders*, 26(3), 161–177. doi:10.1016/0021-9924(93)90006-v.
- Wolk, L., Edwards, M. L., & Brennan, C. (2016). Phonological difficulties in children with autism: An overview. *Speech, Language and Hearing*, 19(2), 121–129. doi:10.1080/2050571x.2015.1133488.

7. THESIS TITLE IN ENGLISH: Summary and key words

LANGUAGE IMPAIRMENTS IN INDIVIDUALS WITH AUTISM SPECTRUM DISORDER

This undergraduate thesis paper deals with language impairments in individuals with Autism Spectrum Disorder. The paper begins with an overview of theories of language impairments in individuals with ASD. Theories which were discussed include Theory of mind deficit, Weak central coherence theory, Executive functioning deficit theory, and Pragmatic language impairment theory. Afterwards, a trajectory of language acquisition in autistic individuals is provided, along with its distinct characteristics which appear during language development. Lastly, language impairments of autistic individuals across linguistic domains of phonology, morphology, syntax, semantics, and pragmatics are analysed.

Key words: Autism Spectrum Disorder, language impairments, phonology, morphology, syntax, semantics, pragmatics

8. NASLOV RADA NA HRVATSKOM JEZIKU: Sažetak i ključne riječi

JEZIČNE POTEŠKOĆE OSOBA S POREMEĆAJEM IZ SPEKTRA AUTIZMA

Ovaj se završni rad bavi jezičnim poteškoćama osoba s poremećajem iz spektra autizma. Rad započinje pregledom teorija o jezičnim poteškoćama kod osoba s poremećajem iz spektra autizma. Razmatrane teorije uključuju teoriju uma, teoriju centralne koherentnosti, teoriju izvršnih funkcija i pragmatičku teoriju. Nakon toga opisuje se redoslijed usvajanja jezika kod osoba iz spektra autizma, uključujući specifične karakteristike koje se pojavljuju tijekom jezičnog razvoja. Na kraju su analizirane jezične poteškoće osoba s poremećajem iz spektra autizma kroz fonološku, morfološku, sintaktičku, semantičku i pragmatičku jezičnu razinu.

Ključne riječi: poremećaj iz spektra autizma, jezične poteškoće, fonologija, morfologija, sintaksa, semantika, pragmatika