OBILJEŽJA RANOG RJEČNIČKOG RAZVOJA U DJECE S POREMEĆAJEM IZ SPEKTRA AUTIZMA

CHARACTERISTICS OF VOCABULARY DEVELOPMENT IN CHILDREN WITH AUTISM SPECTRUM DISORDER

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Sažetak: Poremećaj iz spektra autizma (PSA) neurorazvojni je poremećaj koji obilježavaju prvenstveno nedostatci u socijalnoj interakciji i komunikaciji. Ti nedostatci, prema nekim teorijskim pristupima, čine nestabilan temelj za usvajanje jezika. U najranijim počecima jezičnog razvoja navedeno se može odraziti već u rječničkom razvoju djece s ovim poremećajem. Moguća odstupanja u rječničkom razvoju istražuju se na razini tempa usvajanja riječi te rječničkog sastava. Istraživanja potvrđuju veliku raznolikost u jezičnim sposobnostima djece s poremećajem iz spektra autizma. Većina djece s ovim poremećajem kasni u proizvodnji prvih riječi te ih usvaja sporijim tempom. Zbog toga je veličina njihova rječnika često manja u odnosu na očekivanja prema kronološkoj dobi. Manji dio istraživanja upućuje na moguća odstupanja u rječničkom sastavu, odnosno razvojnim putanjama pojedinih vrsta riječi. Sastav rječnika djelomično se razlikuje u tipološki različitim jezicima, što upućuje na potrebu istraživanja rječničkog razvoja djece s poremećajem iz spektra autizma u različitim jezicima. U hrvatskom jeziku istraživanja rječničkog razvoja djece s ovim poremećajem za sada ne postoje. Temeljem pregleda istraživanja u ovom se radu izdvajaju ključne kliničke implikacije za logopedske intervencije koje uključuju poticanje jezičnog razvoja djece s poremećajem iz spektra autizma te metodološke implikacije za daljnja istraživanja rječničkog razvoja.

Ključne riječi: poremećaj iz spektra autizma, rječnički razvoj, rječnički sastav, hrvatski jezik, metodologija istraživanja rječnika

Abstract: Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder primarily characterised by deficits in social interaction and communication. Based on some theoretical approaches, these deficits provide an unstable foundation for language acquisition. In the earliest stages of language development, this may be reflected in the vocabulary development of children with ASD. Possible deviations in vocabulary development have been investigated at the level of rate of word acquisition and vocabulary composition. Although studies have confirmed that there is significant variability in the language abilities of children with ASD, in many cases, these children experience a delay in the production of first words and acquire words at a slower rate. As a result, the size of their vocabulary is often smaller than expected based on their chronological age. A small body of research points to possible deviations in vocabulary development (i.e., developmental trajectories of specific word classes). Vocabulary composition differs to some extent in typologically different languages, suggesting that vocabulary development in children with ASD needs to be studied in different languages. For Croatian, there is currently no information on the vocabulary development of children with this disorder. Based on a review of literature, this paper highlights important methodological implications for further research on vocabulary development, as well as clinical implications for speech therapy interventions aimed at supporting language development in children with ASD.

Keywords: autism spectrum disorder, vocabulary development, vocabulary composition, Croatian language, vocabulary research methodology

UVOD

Razvoj rječnika temelj je jezičnog razvoja. Bitne odrednice rječničkog razvoja jesu povećanje veličine rječnika i usvajanje različitih vrsta riječi. Ustanovljeno je kako u ranom rječničkom razvoju pojedine vrste riječi nisu ravnomjerno zastupljene u rječniku, već se njihovi udjeli u rječničkom sastavu razlikuju te se na specifičan način mijenjaju usporedno s promjenama u veličini rječnika (Bates i sur., 1994). Kako veličina rječnika raste, neravnomjerno se mijenja udio imenica, glagola, pridjeva i zatvorenih vrsta riječi.

Usvajanje sve većeg broja različitih vrsta riječi odvija se tijekom socijalnih interakcija i u komunikaciji s drugima. Nedostatne sociokognitivne vještine djece s poremećajem iz spektra autizma (PSA), poput teškoća u združenoj pažnji (Dawson i sur., 2004; Bottema-Beutel, 2016), teškoća u razumijevanju namjera drugih (Parish-Morris, Hennon, Hirsh-Pasek, Golinkoff i Tager-Flusberg, 2007) te narušene komunikacijske sposobnosti (Ninio, 1995) čine podlogu na kojoj se temelje pretpostavke narušenog rječničkog razvoja djece s PSA-om u ranoj dobi. Međutim još uvijek nisu u potpunosti razjašnjena obilježja narušenog rječničkog razvoja djece s PSA-om. Otvoreno je pitanje odvija li se njihov rječnički razvoj uz kašnjenje ili i uz odstupanje, odnosno je li rječnik djece s PSA-om samo kvantitativno manji po veličini ili i kvalitativno različit po sastavu u odnosu na rječnik djece tipičnog razvoja?

Cilj je ovog rada na temelju pregleda literature opisati ključna obilježja ranog ekspresivnog rječničkog razvoja djece s poremećajem iz spektra autizma. Temeljem opisa razvojnih promjena u veličini i sastavu rječnika djece s PSA-om pokušat će se dati odgovor na pitanje odvija li se njihov rječnički razvoj samo uz kašnjenje ili i uz neka odstupajuća obilježja. Kako bi se razjasnila prva mogućnost, kašnjenje u rječničkom razvoju, razmotrit će se rezultati istraživanja usmjerenih na tempo rasta veličine rječnika te usporedbu veličine rječnika djece s PSA-om i kontrolnih skupina. Kako bi se objasnila mogućnost odstupanja u rječničkom razvoju, analizirat će se istraživanja usmjerena na zastupljenost različitih vrsta riječi u

INTRODUCTION

Vocabulary development is the foundation of language development. Important determinants of vocabulary development are growth in vocabulary size and acquisition of different word classes. In early lexical development, different word classes are not evenly represented in the vocabulary, but their proportions in vocabulary composition differ and change in a specific way, which occurs in parallel to changes in vocabulary size (Bates et al., 1994). While the size of the vocabulary grows, the proportion of nouns, verbs, adjectives, and closed-class words changes unevenly.

The acquisition of an increasing number of different word classes occurs during social interactions and communication with others. The insufficient socio-cognitive skills of children with autism spectrum disorder (ASD), such as difficulties in joint attention (Dawson et al., 2004; Bottema-Beutel, 2016), difficulties in understanding the intentions of others (Parish-Morris, Hennon, Hirsh-Pasek, Golinkoff and Tager-Flusberg, 2007), and impaired communication skills (Ninio, 1995) form the basis for the assumption of impaired vocabulary development at an early age in these children. However, the characteristics of impaired vocabulary development in children with ASD remains unclear. Researchers continue to question whether the vocabulary development of children with ASD is delayed or deviant (i.e., is the vocabulary quantitatively smaller or qualitatively different in composition in comparison to the vocabulary of typically developing (TD) children?).

The aim of the present study is to describe the key features of early expressive vocabulary development in children with ASD based on a literature review. Considering the description of developmental changes in vocabulary size and composition, we attempted to understand whether the vocabulary development of children with ASD is delayed or deviant. To understand whether there is a delay in vocabulary development, we considered the results of studies focusing on the rate of vocabulary growth and those that compared the vocabulary size of children with and without ASD. To clarify the possibility of deviations in vocabulary development, we analysed studies focused on

rječničkom sastavu djece s PSA-om, udjele riječi u različitim semantičkim kategorijama te usporedbe najčešće korištenih riječi kod djece s PSA-om u odnosu na kontrolne skupine. Navest će se kliničke implikacije za logopedske intervencije usmjerene na poticanje rječničkog razvoja djece s PSA-om.

Naposljetku izdvojit će se ključne metodološke implikacije i smjernice za nova istraživanja, posebice istraživanja kojih nema mnogo, a to su istraživanja ranog rječničkog razvoja djece s PSA-om koja usvajaju jezike različite od engleskog. Naime pokazalo se kako se metodologija istraživanja kao i tipologija jezika može odraziti na rezultate o rječničkom sastavu djece tipičnog razvoja (Dhillon, 2010; Pine, Lieven i Rowland, 1996) zbog čega se takav utjecaj može očekivati i u istraživanjima rječničkog sastava djece s PSA-om. U ovom radu posebno će se istaknuti obilježja i potreba za istraživanjima usvajanja hrvatskog jezika djece s PSA-om.

RJEČNIČKI RAZVOJ I RJEČNIČKI SASTAV U DJECE TIPIČNOG RAZVOJA

Usvajanje riječi jedan je od prvih „zadataka" u usvajanju jezika. To je proces koji podrazumijeva usvajanje novih riječi na razini njihova razumijevanja, a potom i na razini njihove proizvodnje. Dijete je od najranije dobi uronjeno u jezičnu okolinu i uključeno u epizode združene pažnje što mu osigurava prilike za usvajanje značenja riječi i razvoj receptivnog rječnika (Hoff, 2018). Tako na primjer djeca u dobi od devet mjeseci u prosjeku razumiju od 10 do 20 riječi, a u dobi od 12 mjeseci od 70 do 100 riječi (Frank, Braginsky, Yurovsky i Marchman, 2021). To „skladištenje" riječi i brbljanje na koje okolina odgovara te modelira uporabu riječi jest put koji vodi k proizvodnji riječi. Tako djeca tipičnog razvoja u dobi od 10 do 15 mjeseci počinju s proizvodnjom prvih riječi sa značenjem (Benedict, 1979; Fenson, Dale, Reznick i Bates, 1994). Prepoznato je kako se razvoj ekspresivnog rječnika sastoji od određenih faza (Hoff, 2018) koje se razlikuju u tempu usvajanja novih riječi te u sastavu rječnika na razini vrsta riječi.

the proportions of different word classes in the vocabulary composition of children with ASD, those that examined the proportions of words in different semantic categories, and those that compared the most frequently used words by children with ASD and control groups without ASD.

In addition, we recommend clinical implications for speech therapy interventions aimed at supporting vocabulary development in children with ASD. Important methodological implications and guidelines for new research are highlighted, especially research on the early vocabulary development of children with ASD who acquire/learn languages other than English. It has been shown that both research methodology and language typology can be reflected in the vocabulary outcomes of TD children (Dhillon, 2010; Pine, Lieven, and Rowland, 1996). Therefore, we can expect such an influence on the vocabulary composition of children with ASD. Finally, this paper highlights the characteristics and need for further research on Croatian language acquisition in children with ASD.

VOCABULARY DEVELOPMENT AND VOCABULARY COMPOSITION IN TYPICALLY DEVELOPING CHILDREN

Vocabulary acquisition is one of the first "tasks" in language acquisition. It is a process in which new words are acquired, first at the level of comprehension and then at the level of production. The child is immersed in the language environment from an early age and is involved in episodes of joint attention that provide opportunities to grasp the meaning of words and promote the development of receptive vocabulary (Hoff, 2018). For example, children understand an average of 10 to 20 words at the age of nine months of age, and 70 to 100 words at the age of 12 months (Frank, Braginsky, Yurovsky and Marchman, 2021). This "storage" of words and the "babbling" to which people in the child's environment respond can help them model the use of words, subsequently leading to the production of words. Thus, at the age of 10 to 15 months, TD children begin to produce their first words with meaning (Benedict, 1979; Fenson, Dale, Reznick and Bates, 1994). It is known that development of

U većine djece zapažaju se razlike u brzini usvajanja novih riječi u različitim fazama rječničkog razvoja. Nakon proizvodnje prve riječi daljnje usvajanje novih riječi u sljedećih nekoliko mjeseci odvija se sporo. Nakon usvojenih okvirno 50 riječi u ekspresivnom rječniku tempo usvajanja novih riječi postaje sve ubrzaniji, zbog čega se taj period naziva i rječničkim brzacem (Woodwrad, Markman i Fitzsimmons, 1994). Dijete otada usvaja prosječno 40 novih riječi mjesečno i nastavlja s periodom dugog, kontinuiranog i intenzivnog rječničkog usvajanja (Benedict, 1979; Dromi, 1999; Reznick i Goldfield, 1992).
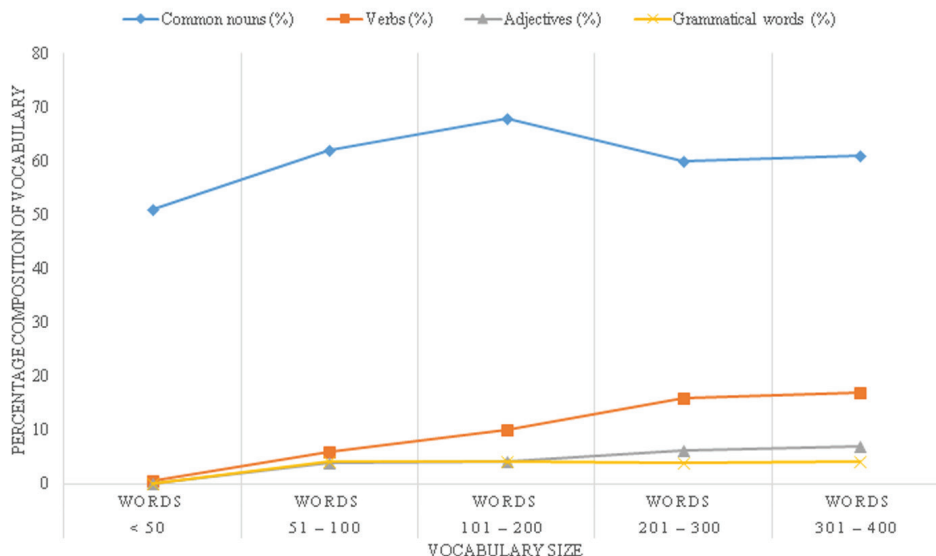
Usporedno s opisanim kvantitativnim promjenama u brzini usvajanja novih riječi, a time i u veličini rječnika, u rječničkom se razvoju odvijaju specifične promjene i u njegovu sastavu. S povećanjem veličine rječnika mogu se pratiti nejednolične razvojne putanje pojedinih vrsta riječi, odnosno promjene u njihovoj zastupljenosti u rječniku (Bates i sur., 1994). Na primjer uočeno je da u periodu u kojem veličina rječnika doseže do 100 riječi raste udio općih imenica te da one prevladavaju u odnosu na druge vrste riječi. Zbog tog obilježja ta se faza u literaturi naziva referencijalnom fazom u jezičnom razvoju (Bates i sur., 1994), a prevlast imenica u ranom rječničkom razvoju poznata je pod nazivom tzv. imeničke sklonosti (Gentner, 1982). Razvojna putanja glagola i pridjeva slijedi spori linearni rast s uočljivo najvećim povećanjem zastupljenosti u periodu u kojem veličina rječnika doseže 100 do 400 riječi. Ta faza naziva se predikativnom, a neki autori izraženi porast glagola u njoj opisuju kao glagolski brzac (Kovačević, Pfeiler i Palmović, 2007). Konačno, u fazi kada se rječnik sastoji od 400 i više riječi, javljaju se u većoj mjeri zatvorene ili gramatičke vrste riječi (modalni i pomoćni glagoli, zamjenice, upitne riječi, prijedlozi, označivači količine, članovi i veznici) (Bates i sur., 1994). Smatra se kako upravo ove vrste riječi čine prave elemente gramatike zbog čega se ova faza naziva gramatičkom fazom.

Ovi trendovi reorganizacije sastava rječnika tijekom rječničkog razvoja prvotno su opisani istraživanjima engleskog jezika pa se istraživanjima drugih jezika nastoji utvrditi jesu li ti trendovi

expressive vocabulary consists of specific phases (Hoff, 2018), which differ in the rate of acquisition of new words and in the composition of vocabulary at the level of word classes.

In most children, differences in the rate of acquisition of new words can be observed at different stages of vocabulary development. After the production of the first word, further acquisition of new words occurs slowly over the next few months. After acquiring about 50 words in the expressive vocabulary, the acquisition of new words accelerates, which is why this period is referred to as "word spurt" (Woodwrad, Markman and Fitzsimmons, 1994). The child has now acquired an average of 40 new words per month and proceeds into a period of long, continuous, and intensive vocabulary acquisition (Benedict, 1979; Dromi, 1999; Reznick and Goldfield, 1992).

Corresponding to the described quantitative changes in the rate of acquisition of new words and in the size of the vocabulary, specific changes in its composition also take place during vocabulary development. As vocabulary size increases, uneven developmental trajectories of specific word classes can be observed (i.e., changes in their proportions in the vocabulary) (Bates et al., 1994). For example, it has been observed that in a period in which vocabulary size reaches up to 100 words, the proportion of common nouns increases and are predominant in relation to other word classes. This period is referred to in the literature as the "reference phase" of language development (Bates et al., 1994), and the predominance of nouns in early vocabulary development is known as "noun bias" (Gentner, 1982). The developmental trajectory of verbs and adjectives follows a slow linear growth, with the highest increase in proportion occurring at a phase when vocabulary size reaches 100 to 400 words. This phase is called the "predicative" phase, and some authors describe an increase of verbs in this phase as a "verb spurt" (Kovačević, Pfeiler and Palmović, 2007). Finally, in the stage where the vocabulary consists of 400 or more words, closed-class or grammatical words (modal and auxiliary verbs, pronouns, interrogatives, prepositions, quantifiers, articles and conjunctions) appear in greater proportion (Bates et al., 1994; Caselli et al., 1995). These word classes are assumed to form the proper ele-

Slika 1. *Sastav ekspresivnog rječnika hodančadi dobi od 1;04 do 2;06 koja govore hrvatski jezik u odnosu na veličinu rječnika na 50. centilu prema Komunikacijskim razvojnim ljestvicama (Kovačević i sur., 2007)* / **Figure 1.** *Composition of the expressive vocabulary of Croatian-speaking toddlers in relation to vocabulary size at the 50th percentile based on data from the Communicative Development Inventories (Kovačević et al., 2007).*

univerzalni. Velik broj istraživanja drugih jezika potvrđuje kako su opisane razvojne promjene u rječničkom sastavu gotovo univerzalne, odnosno prisutne u rječničkom razvoju različitih jezika poput francuskog, talijanskog, španjolskog, njemačkog (Bassano, Maillochon i Eme 1998; Caselli i sur., 1995; Frank i sur., 2021; Jackson-Maldonado, Thal, Marchman, Bates i Gutierrez-Clellen, 1993) te hrvatskog jezika (Kovačević, Jelaska, Kuvač Kraljević i Cepanec, 2007) (Slika 1).

Međutim dio istraživanja ukazuje na razlike u zastupljenosti pojedinih vrsta riječi u jezicima različitima od engleskog. Neki su od tih jezika švedski, japanski, francuski (Boysson-Bardies 1996, prema Bassano 1998; Bassano, 2000), korejski (Choi i Gopnick, 1995), mandarinski (Tardif, 1996) i hrvatski jezik (Kovačević, Pfeiler i Palmović, 2007; Hržica, 2007; Popčević, Košutar i Hržica, 2021). U njima je pronađena veća zastupljenost glagola u odnosu na engleski jezik, posebice u ranijim fazama rječničkog razvoja. Razlozi ovih razlika mogu biti tipološka obilježja jezika te neka sociokulturna obilježja (Dhillon, 2010). Tako primjerice hrvatski jezik obilježava veliko morfološko bogatstvo, posebno glagolskog sustava što povećava udio glagolskih oblika (tzv.

ments of grammar, which is why this stage is also referred to as the "grammatical stage".

These trends in the reorganisation of vocabulary composition during vocabulary development were originally described in English, and studies conducted in other languages are trying to determine if these trends are universal. Numerous studies on other languages confirm that the described developmental changes in vocabulary are almost universal (i.e., they occur in the vocabulary development of different languages such as French, Italian, Spanish, German (Bassano, Maillochon and Eme 1998; Caselli et al., 1995; Frank et al., 2021; Jackson-Maldonado, Thal, Marchman, Bates, and Gutierrez-Clellen, 1993), as well as Croatian (Kovačević, Jelaska, Kuvač Kraljević and Cepanec, 2007) (Fig. 1)).

However, several studies point to differences in the representation of certain word classes in languages other than English, for example, in Swedish, Japanese, and French (Boysson-Bardies 1996, according to Bassano 1998; Bassano, 2000), Korean (Choi and Gopnick, 1995), Mandarin (Tardif, 1996), and Croatian (Kovačević, Pfeiler and Palmović, 2007; Hržica, 2007; Popčević, Košutar and Hržica, 2021). A higher representation of verbs was observed in these languages compared to English, especially in the early stages

različnica) u jezičnim uzorcima. U glagolskoj morfologiji sadržana je i informacija o subjektu ili zamjenici zbog čega se oni često u sintaktičkom poretku rečenice ispuštaju. Moguće je da se navedena obilježja odražavaju na spomenutu veću zastupljenost glagola u hrvatskom jeziku od najranijih faza jezičnog razvoja (Hržica, 2007; Popčević, Košutar i Hržica, 2021). Prema Korpusu hrvatskog dječjeg jezika (Kovačević, 2003), u početnim fazama usvajanja riječi bilježi se blaga prevlast imenica ili podjednaka zastupljenost imenica i glagola do kronološke dobi 2;0. Nakon te dobi zastupljenost glagola značajno raste i prema broju različnica premašuje zastupljenost imenica (Hržica, 2007). Valja napomenuti kako sva ova istraživanja i zaključke koji proizlaze iz njihovih usporedbi treba sagledati iz perspektive metodologije istraživanja i upotrijebljenih rječničkih mjera, što je detaljnije razloženo u zadnjem poglavlju ovog rada.

Univerzalne promjene u rječničkom razvoju, odnosno opisane promjene u zastupljenosti pojedinih vrsta riječi važne su zbog povezanosti s razvojem drugih jezičnih sastavnica. Smatra se kako je rani rječnik temelj razvoja morfosintakse zbog čega se ranom rječniku pridaje uloga tzv. leksičke vučnice (Bates i Goodman, 1997; Dale, Dionne, Eley i Plomin, 2000). Pojam *vučnica* u području jezičnog usvajanja označava mehanizam učenja koji koristi informacije jedne jezične sastavnice kao pokretače razvoja drugih jezičnih sastavnica (Bittner i Ruhlig, 2013). Prema pretpostavci *leksičke vučnice* razvoj djetetovih gramatičkih sposobnosti „povučen" je rječničkim razvojem. Tako usvojenost većeg broja riječi omogućuje na razini sintakse povezivanje tih riječi u iskaze (Bassano, 2000). No osim same veličine rječnika za jezični se razvoj važnim smatra i njegov sastav. Djeca počinju povezivati različite kombinacije riječi u prve rečenice tek kada dosegnu određenu veličinu rječnika (Bates, Dale i Thal, 1995) i kada usvoje u većoj mjeri glagole (Bates, Thal, Finlay i Clancy 1992) i funkcionalne riječi (Kauschke i Hofmeister, 2002). Može se zaključiti kako promjene u veličini i sastavu rječnika na neki način uvjetuju gramatički razvoj.

of vocabulary acquisition. The reasons for these differences may be typological features of the language and certain socio-cultural features (Dhillon, 2010). For example, the Croatian language is characterised by a great morphological richness, especially in the verb system, which increases the proportion of verb forms (so-called types) in language samples. Verb morphology also contains information about the subject or pronoun, which is why they are often omitted from the sentence syntactic order. These characteristics are reflected in the aforementioned greater representation of verbs in Croatian since the earliest stages of language development (Hržica, 2007; Popčević, Košutar and Hržica, 2021). According to the Croatian corpus of child language (Kovačević, 2003), the initial stages of word acquisition is dominated by nouns, or nouns and verbs can be equally represented until the age of two years (Hržica, 2007). After this age, the proportion of verbs increases significantly, and the number of verb types exceeds the proportion of nouns (Hržica, 2007). It should be noted that these studies and the conclusions resulting from their comparisons should be considered from the perspective of research methodology and measures of vocabulary use, which will be further explained in the last part of this paper.

Universal changes in vocabulary development (i.e., the changes in the representation of certain word classes described above) are important because of their relationship with the development of other language components. Early vocabulary is thought to form the basis for the development of morphosyntax, which is why early vocabulary plays a role which is called "lexical bootstrapping" (Bates and Goodman, 1997; Dale, Dionne, Eley and Plomin, 2000). The term *bootstrapping* in the field of language acquisition refers to a learning mechanism that uses information from one language component as a driver for the development of other language components (Bittner and Ruhlig, 2013). According to the assumption of lexical bootstrapping, the development of a child's grammatical abilities is "pulled" by vocabulary development. For example, the acquisition of a larger number of words at the level of syntax enables these words to be combined into utterances (Bassano, 2000). However, in addition to the size of the vocabulary, its composition is also considered important for language development. Children begin to combine different words in their first sentences only

Ukratko, rječnički razvoj dinamičan je proces koji se odvija u većine djece tipičnog razvoja (TR) u specifičnim fazama. Njih obilježavaju promjene u brzini usvajanja novih riječi te razlike u zastupljenosti pojedinih vrsta riječi u rječničkom sastavu ovisno o veličini rječnika (Bassano i sur., 1998). Poznavanje opisanih razvojnih miljokaza rječničkog razvoja djece tipičnog razvoja polazišna je točka za istraživanja rječničkog razvoja djece s poremećajem iz spektra autizma. Valja imati na umu kako se obilježja rječničkog sastava mogu djelomično razlikovati u različitim jezicima. Zbog toga se rezultati o rječničkom razvoju najčešće istraživanog engleskog jezika ne mogu izravno preslikati na druge tipološki različite jezike.

TEORIJSKA ISHODIŠTA I PODLOGA ISTRAŽIVANJA RJEČNIČKOG RAZVOJA U DJECE S POREMEĆAJEM IZ SPEKTRA AUTIZMA

Sociopragmatički pristupi usvajanja jezika i, specifično, usvajanja riječi naglašavaju inherentnost socijalne prirode tog procesa (Akhtar i Tomasello, 1998). Ističe se kako se učenje riječi događa prirodno tijekom socijalnih interakcija u kojima djeca pokušavaju razumjeti tuđe komunikacijske namjere oblikovane u jezičnim iskazima (Tomasello, 2003). Učenje jezika smatra se „intrinzično socijalnim jer se riječi uče u interakciji s drugima i za komunikaciju s drugima", odnosno za komunikacijske svrhe (Akhtar i Tomasello, 2000, str. 117). Prema sociopragmatičkim pristupima komunikacijske svrhe pokreću učenje jezika.

Uzimajući u obzir ovu perspektivu i ključna obilježja djece s PSA-om, teškoće u socijalnoj komunikaciji, postavlja se pitanje kako se odvija njihov rani rječnički razvoj?

Dodatan poticaj za istraživanje toga pitanja daju i druga obilježja djece s PSA-om koja prema *Dijagnostičkom i statističkom priručniku za duševne poremećaje* (DSM-5) pripadaju tzv. B kriterijima (Američka psihijatrijska udruga, 2013), a odnose se na ograničene i ponavljajuće obrasce ponašanja. Pretpostavlja se da bi se uz teškoće

when they reach a certain vocabulary size (Bates, Dale and Thal, 1995) and acquire more verbs (Bates, Thal, Finlay and Clancy 1992), 1992) and function words (Kauschke and Hofmeister, 2002). Changes in the size and composition of vocabulary helps condition grammatical development.

In short, vocabulary development is a dynamic process that occurs in specific phases in most TD children. These phases are characterised by changes in the rate of acquisition of new words and by differences in the representation of word classes in vocabulary as a function of vocabulary size (Bassano et al., 1998). Knowledge of the described developmental milestones of vocabulary development in TD children forms the basis for research on vocabulary development in children with ASD. It is important to keep in mind that vocabulary composition may differ to some extent across languages. Therefore, the results on lexical development of the extensively studied English language cannot be directly transferred to other typologically different languages.

THEORETICAL FOUNDATIONS AND BASIS OF RESEARCH ON VOCABULARY DEVELOPMENT IN CHILDREN WITH AUTISM SPECTRUM DISORDER

Socio-pragmatic approaches to language acquisition, and word acquisition in particular, emphasise the inherently social nature of the process (Akhtar and Tomasello, 1998). Word acquisition occurs naturally during social interactions in which children try to understand others communicative intentions expressed through linguistic utterances (Tomasello, 2003). Language acquisition is considered "inherently social, as words are learned in interaction with others and for communication with others", (i.e., for communication purposes) (Akhtar and Tomasello, 2000, p. 117). According to socio-pragmatic approaches, communication purposes are the driving force of language acquisition.

Given this perspective and the main characteristics of children with ASD (i.e., difficulties in social communication), the question of how their early vocabulary development proceeds must be examined.

An additional motive for research on this topic comes from other characteristics of children with ASD, which according to the Diagnostic and Statis-

socijalne komunikacije na rječnički razvoj mogli odražavati i njihovi neobični i idiosinkratski interesi, netipične zaokupljenosti, ograničena uporaba predmeta, teškoće u teoriji uma, tendencija usmjeravanja na dijelove predmeta prije nego na cijeli predmet (npr. na stranice slikovnice prije nego na slike u slikovnici) i na senzoričke osobitosti predmeta prije nego na njihovu funkcionalnu upotrebu (Rescorla i Sayfer, 2013; Bruckner, Yoder, Stone i Saylor, 2007; Farrar i Maag, 2002). Uzimajući u obzir ova obilježja djece s PSA-om pretpostavlja se kako bi se njihov rječnički razvoj mogao odvijati na netipičan način. Jedna je od pretpostavki da se rječnički razvoj djece s PSA-om odvija uz kašnjenje, odnosno da se razvija sporijim tempom, ali uz slične razvojne promjene i faze kao u djece tipičnog razvoja. Druga pretpostavka odnosi se na mogućnost postojanja specifičnih odstupanja koja nisu prisutna u rječničkom razvoju djece tipičnog razvoja. Neka od tih odstupanja mogla bi se ogledati u razlikama u rječničkom sastavu u odnosu na očekivanja prema veličini rječnika ili u razlikama u najčešće korištenim riječima djece s PSA-om u odnosu na djecu tipičnog razvoja. Primjerice teškoće u razumijevanju socijalnih namjera mogle bi imati nepovoljan utjecaj na usvajanje glagola i prijedloga (Parish-Morris, 2011), a teškoće u teoriji uma mogle bi se povezati s teškoćama u usvajanju mentalnih glagola (Tager-Flusberg, 1992).

Provjere ovih pretpostavki nalaze se u istraživanjima usmjerenima na: 1) tempo rasta rječnika djece s PSA-om, 2) sastav rječnika prema gramatičkim i semantičkim kategorijama riječi te 3) najčešće korištene riječi u djece s PSA-om. Skupine djece s PSA-om najčešće se u istraživanjima izjednačuju s kontrolnim skupinama prema veličini rječnika.

TEMPO RJEČNIČKOG RAZVOJA DJECE S POREMEĆAJEM IZ SPEKTRA AUTIZMA

Istraživanja jezičnog razvoja u djece s PSA-om generalno ukazuju na značajnu raznolikost u njihovim jezičnim sposobnostima (Smith, Mirenda i Zaidman-Zait, 2007; Lord, Risi i Pickles, 2004; Tek, Mesite, Fein i Naigles, 2014). Ta var-

tical Manual of Mental Disorders (DSM-5) belong to the so-called B criteria (American Psychiatric Association, 2013) and refer to limited and repetitive patterns of behaviour. It is presumed that, in addition to difficulties in social communication, their unusual and idiosyncratic interests, atypical occupations, limited use of objects, difficulties with theory of mind, tendency to focus on parts of objects rather than the whole object (e.g., on the pages in the book, rather than pictures in a picture book), and sensory features of objects, rather than on their functional use, may be reflected in vocabulary development (Rescorla and Sayfer, 2013; Bruckner, Yoder, Stone and Saylor, 2007; Farrar and Maag, 2002).

Given these characteristics, it is assumed that the vocabulary development of children with ASD is atypical. One of the assumptions is that the vocabulary development is delayed, but although their vocabulary develops more slowly, they undergo developmental changes and phases that are similar to those seen in TD children. The second assumption refers to the possibility that there are specific discrepancies that are not present in the vocabulary development of TD children. Some of these discrepancies might be evident in differences in vocabulary composition compared to the expected vocabulary size, or in differences in the most frequently used words by children with ASD compared to TD children. For example, difficulties in understanding social intentions could have a negative effect on the acquisition of verbs and prepositions (Parish-Morris, 2011), and weaknesses in the "Theory of Mind" could be associated with difficulties in acquisition of mental state verbs (Tager-Flusberg, 1992).

These assumptions can be examined through studies aimed at assessing (1) vocabulary growth rate in children with ASD, (2) vocabulary composition, including grammatical and semantic categories of words, and 3) words that are frequently used by children with ASD. In these studies, children with ASD are usually compared to children without ASD with the same vocabulary size.

RATE OF VOCABULARY DEVELOPMENT IN CHILDREN WITH AUTISM SPECTRUM DISORDER

Research on language development in children with ASD generally indicates considerable variabil-

ijabilnost očituje se i u tempu rječničkog razvoja (Charman, Drew, Baird i Baird, 2003; Luyster, Lopez i Lord, 2007; Rollins, 1999). Smith i sur. (2007) opisuju četiri različite putanje rasta ekspresivnog rječnika na temelju longitudinalnog dvogodišnjeg praćenja razvoja rječnika djece s PSA-om s početnom veličinom rječnika manjom od 50 riječi i prosječne dobi 45 mjeseci. U neke djece stopa rasta gotovo je ravna s vrlo blagim porastom (rječnik se povećao tek za 10 riječi). Putanju rasta druge skupine djece s PSA-om obilježava spori porast uz usvojenih u prosjeku 200 novih riječi tijekom dvogodišnjeg perioda. Rječnički razvoj treće skupine obilježava postojano visok porast veličine rječnika s usvojene prosječno 453 nove riječi. Četvrta skupina pokazuje strmi porast s povećanjem rječnika za 638 riječi. Unatoč ovoj varijabilnosti stopa rječničkog rasta sve četiri skupine daleko je ispod očekivane u odnosu na djecu tipičnog razvoja (Smith i sur., 2007). Istraživanja potvrđuju kako u djece s PSA-om značajna kašnjenja u rječničkom razvoju postoje i u odnosu na očekivanja prema njihovim neverbalnim kognitivnim sposobnostima (Charman i sur., 2003; Mitchell i sur., 2006; Luyster i sur., 2007). Primjerice djeca s PSA-om neverbalne mentalne dobi 2;0–2;5 i kronološke dobi 3;4 proizvode u prosjeku trideset riječi (Charman i sur., 2003; Luyster i sur., 2007). Za usporedbu dječaci tipičnog razvoja u prosjeku proizvode trideset riječi u dobi 1;4 (Fenson, Marchman, Thal, Reznick i Bates, 2007). Primijećeno je kako usvajanje novih riječi u djece s PSA-om kasni i u odnosu na djecu koja kasnije progovaraju (engl. *late talkers*) (Ellis Weismer i sur., 2011). Iz ovakvog obrasca razvoja može se zaključiti kako porastom mentalne i kronološke dobi djece s PSA-om raste i njihov ekspresivni rječnik, no sporijim tempom od očekivanog (Charman i sur., 2003; Luyster i sur., 2007; Smith i sur., 2007). Na temelju tih istraživanja može se potvrditi pretpostavka kako se rječnički razvoj većine djece s PSA-om generalno odvija uz kašnjenje.

ity in their language abilities (Smith, Mirenda and Zaidman-Zait, 2007; Lord, Risi and Pickles, 2004; Tek, Mesite, Fein and Naigles, 2014). This variability is evident in the rate of vocabulary development (Charman, Drew, Baird and Baird, 2003; Luyster, Lopez and Lord, 2007; Rollins, 1999). Smith et al. (2007) described four different growth trajectories of expressive vocabulary based on a two-year longitudinal study of vocabulary development in children with ASD with an initial vocabulary size of less than 50 words and an average age of 45 months. For some children, the growth rate was almost flat with very little growth (vocabulary increased by only 10 words). The growth trajectory of the second group of children was characterised by a slow increase with an average of 200 newly acquired words over the same two-year period. The growth trajectory of the third group was characterised by a steady increase in vocabulary, with an average of 453 new words acquired over the two-year period, while the fourth group showed a steep increase in vocabulary, with a growth of 638 words over the two-year period. Despite this variability, the rate of vocabulary growth in all four groups was significantly lower than that observed in TD children (Smith et al., 2007).

Children with ASD also exhibit significant delays in vocabulary development compared to the expectations corresponding to their nonverbal cognitive abilities (Charman et al., 2003; Mitchell et al., 2006; Luyster et al., 2007). For example, children with ASD produce an average of thirty words at the nonverbal mental age of 2-2.5 years and at the chronological age of 3.4 years (Charman et al., 2003; Luyster et al., 2007). In comparison, TD boys produce thirty words at the age of 1.4 years (Fenson, Marchman, Thal, Reznick and Bates, 2007). It has been observed that the acquisition of new words is delayed in children with ASD compared to children without ASD who began speaking later than usual (late talkers) (Ellis Weismer et al., 2011). Based on this developmental pattern, it can be concluded that, as the mental and chronological age of children with ASD increases, so does their expressive vocabulary, but this occurs at a slower rate than expected (Charman et al., 2003; Luyster et al., 2007; Smith et al., 2007). Based on these studies, we can confirm

RJEČNIČKI SASTAV PREMA VRSTAMA RIJEČI U DJECE S POREMEĆAJEM IZ SPEKTRA AUTIZMA

Pregledom istraživanja rječničkog sastava u djece s PSA-om nalaze se različiti zaključci o udjelu imenica, glagola, pridjeva i zatvorenih vrsta riječi u specifičnim fazama rječničkog razvoja u odnosu na očekivani rječnički sastav.

Neka istraživanja, temeljena na listama riječi koje ispunjavaju roditelji, pokazuju kako je rječnički profil djece s PSA-om po udjelu vrsta riječi sličan profilu djece tipičnog razvoja i djece s razvojnim kašnjenjem, izjednačene prema veličini rječnika (Charman i sur., 2003; Luyster i sur., 2007; Rescorla i Sayfer, 2013). Udio imenica povećava se do veličine rječnika od 50 riječi, udio glagola i pridjeva povećava se nakon usvojenih 50 riječi, a udio zatvorenih vrsta riječi (zamjenica, prijedloga, upitnih riječi, označivača količine, članova, pomoćnih glagola i veznika) ostaje nizak sve do veličine rječnika 100–200 riječi (Charman i sur., 2003). Valja napomenuti kako je tu veličinu rječnika dosegnula manjina djece u istraživanim uzorcima. Detaljniji pregled promjena u udjelima vrsta riječi u odnosu na promjene u veličini rječnika prikazan je u Tablici 1.

Na temelju ove skupine istraživanja može se zaključiti kako djeca s PSA-om pokazuju teškoće u vidu sporijeg tempa usvajanja novih riječi i kašnjenja u razvoju rječnika, ali po rječničkom sastavu njihov rječnički profil usporediv je s profilom djece s razvojnim kašnjenjem i profilom djece tipičnog razvoja iste veličine rječnika. S druge se strane nalaze podatci istraživanja koji ukazuju na određena odstupanja u rječničkom sastavu djece s PSA-om u vidu veće zastupljenosti glagola u odnosu na djecu TR-a iste veličine rječnika (od 1 do 75 riječi) te u odnosu na djecu koja kasnije

the assumption that the vocabulary development of most children with ASD is generally delayed.

VOCABULARY COMPOSITION BY WORD CLASSES IN CHILDREN WITH AUTISM SPECTRUM DISORDER

A review of vocabulary research involving children with ASD reveals different conclusions about the proportion of nouns, verbs, adjectives, and closed-class words acquired at specific stages of vocabulary development compared to the expected proportion in vocabulary composition.

Some studies based on word lists completed by parents show that the vocabulary profile (in terms of word classes) of children with ASD is similar to that of TD children and children with developmental delays who have the same vocabulary size (Charman et al., 2003; Luyster et al., 2007; Rescorla and Sayfer, 2013). The proportion of nouns increases up to a vocabulary size of 50 words, followed by an increase in the proportion of verbs and adjectives, while the proportion of closed-class words (pronouns, prepositions, interrogatives, quantifiers, articles, auxiliary verbs, and conjunctions) remains low up to a vocabulary size of 100 - 200 words (Charman et al., 2003). It should be noted that this vocabulary size was achieved only by a minority of children in the samples studied. A more detailed overview of the changes in the proportion of word classes relative to the change in vocabulary size is presented in Table 1.

Based on these studies, it can be concluded that although children with ASD acquire new words more slowly and show delays in vocabulary development, their vocabulary profile is comparable to that of children with developmental delays and TD children with the same vocabulary size. On the other hand, there are certain deviations in vocabulary of children with ASD in the

Tablica 1. *Udio vrsta riječi u odnosu na cjelokupnu proizvodnju riječi djece s PSA-om prema istraživanju Charmana i sur. (2003) /* **Table 1.** *Proportion of word classes in relation to total word production of children with ASD based on Charman et al. (2003)*

	Nouns (46% words in checklist)	Verbs and adjectives (23.2% words in checklist)	Closed-class words (9.1% words in checklist)
21-50 words	45.6	8.0	4.8
> 50 words	56.1	13.1	4.0

progovaraju, izjednačenu prema veličini rječnika (od 1 do 50 riječi) (Jiménez, Haebig i Hills, 2020).

Ipak, valja uočiti kako su spomenuta istraživanja usmjerena pretežno na najraniju fazu rječničkog razvoja. Manjina sudionika dosegnula je veličinu rječnika veću od 100 riječi, a upravo je u rječniku veličine iznad 100 riječi moguće očekivati značajnije promjene u zastupljenosti predikativnih (glagola i pridjeva) te poslije zatvorenih vrsta riječi. Često su i skupine šireg raspona prema veličini rječnika uspoređivane kao jedna skupina zbog čega je otežano praćenje specifičnih promjena u fazama kada se te promjene očekuju. Primjerice Rescorla i Sayfer (2013) zaključuju kako u udjelu vrsta riječi ne postoje razlike između djece s PSA-om i normativnog uzorka veličine rječnika do 49 riječi, međutim u skupinama s veličinom rječnika od 1 do 310 riječi ustanovljene su razlike na svim kategorijama vrsta riječi. Navedeno pak valja analizirati s oprezom jer su se skupine unatoč istom rječničkom rasponu razlikovale u prosječnoj veličini rječnika. Iz navedenih ograničenja proizlazi potreba za istraživanjem rječničkog sastava u fazama u kojima se očekuju specifične promjene u udjelu pojedinih vrsta riječi. Primjerice značajna razvojna promjena događa se u predikativnoj fazi u kojoj se očekuje porast u zastupljenosti glagola. Uvidom u tu fazu rječničkog razvoja nekih istraživanja pronalaze se razlike u sastavu rječnika djece s PSA-om i djece TR-a. Usporedbom postignuća na Komunikacijskoj razvojnoj ljestvici djece s PSA-om koja usvajaju mandarinski jezik prosječne veličine ekspresivnog rječnika od 388 riječi (u rasponu 265–498) s djecom tipičnog razvoja iste veličine rječnika, uočeno je kako se ove dvije skupine značajno razlikuju u udjelu glagola (Su, Naigles i Su, 2018). Udio glagola značajno je veći u rječniku djece tipičnog razvoja nego u rječniku djece s PSA-om.

Neke razlike na razini vrsta riječi u engleskom jeziku pronađene su i analizom longitudinalnih spontanih jezičnih uzoraka djece s PSA-om i djece s Downovim sindromom, izjednačene prema dobi i prosječnoj duljini iskaza (Tager-Flusberg i sur., 1990). U fazama u kojima prosječna duljina iskaza (u morfemima) iznosi 2,0–2,5 i 2,5–3,0 djeca s PSA-om upotrebljavaju više imenica, dok

form of higher proportions of verbs compared to TD children with the same vocabulary size (from 1-75 words) and late talkers with vocabulary size of 1-50 words (Jiménez, Haebig, and Hills, 2020).

It should be noted, however, that the aforementioned studies focus mainly on the earliest stage of vocabulary development. Only a minority of participants reached a vocabulary of more than 100 words, and this is the vocabulary size at which one might expect significant changes in the representation of predicative (verbs and adjectives) and closed-class words. Often, children with a wider vocabulary range have been compared as one group, making it difficult to observe specific changes at the stages when these changes might be expected. For example, Rescorla and Sayfer (2013) reported that there were no differences in the proportion of different word classes between children with ASD and the normative sample for vocabulary size up to 49 words. However, in groups of children with vocabularies ranging from 1-310 words, differences were observed in all word classes. The above results should be interpreted with caution as the groups differed in their average vocabulary size, despite the same vocabulary range.

Based on the above limitations, there is a need to examine lexical composition at the stages when specific changes in the proportion of particular word class are expected to occur. For example, a significant developmental change occurs in the predicative phase when an increase in the number of verbs is expected. Some studies have provided insight into this phase of vocabulary development and have shown differences in vocabulary composition between children with ASD and TD children. When data from the Communicative Development Inventories on the performance of children with ASD in Mandarin Chinese language with an average expressive vocabulary of 388 words (ranging from 265 to 498) was compared to the performance of TD children with the same vocabulary size, it was found that these two groups differ significantly in the proportion of verbs (Su, Naigles and Su, 2018): the proportion of verbs was significantly higher in the vocabulary of TD children than in the vocabulary of children with ASD.

djeca s Downovim sindromom upotrebljavaju više zatvorenih vrsta riječi (zamjenica, članova, veznika, prijedloga i pomoćnih riječi). Okvirna veličina rječnika u tim stadijima iznosi 100–200 riječi, odnosno 200–1000 riječi (Brown, 1973 prema LAMP Training Module), što odgovara predikativnoj i gramatičkoj fazi u rječničkom razvoju. Unatoč navedenim razlikama, autori zaključuju kako se s naprednijim jezičnim sposobnostima (povećanjem prosječne duljine iskaza i povećanjem veličine rječnika) smanjuje udio imenica, a raste udio glagola i zatvorenih vrsta riječi, potvrđujući tako opće razvojne obrasce pronađene i u djece tipičnog razvoja. Primijećene razlike u nekim fazama autori ovog istraživanja tumače razlikama u stilovima usvajanja jezika, dok neki drugi istraživači ukazuju kako ovo može odražavati dublje razlike u načinima kako se jezik usvaja (Bates, Bretherton i Snyder, 1988). Potkrjepe o mogućim razlikama u usvajanju pojedinih vrsta riječi daju i istraživanja koja ukazuju na to da djeca s PSA-om mogu imati teškoća u usvajanju riječi s odnosnim značenjem kao što su glagoli i modifikatori (riječi koje označavaju svojstvo stvari ili događaja) (Hobson, 1989; Menyuk i Quill, 1985) te funkcionalnih riječi (prijedloga, veznika i zamjenica) (Ricks i Wing, 1975). Studija slučaja u kojoj je opisan dječak s PSA-om u dobi od 3;03 do 4;0 ukazuje na prevlast nominalnih vrsta riječi (koje se odnose uglavnom na imenice) te manju zastupljenost riječi koje označavaju radnje u odnosu na njihovu zastupljenost u rječnicima djece tipičnog razvoja (Williams, 1993).

Sažeto, istraživanja pretežno pokazuju kako djeca s PSA-om ne pokazuju značajna odstupanja u rječničkom sastavu na razini vrsta riječi. Sporadično se pojavljuju podatci koji ukazuju na neka odstupanja, najčešće u zastupljenosti glagola u rječničkom sastavu. Pregled istraživanja na kojima se temelje ovi zaključci prikazan je u Tablici 2.

SEMANTIČKE KATEGORIJE I NAJČEŠĆE UPOTREBLJAVANE RIJEČI U DJECE S PSA-OM

Osim istraživanja rječničkog sastava na razini udjela vrsta riječi moguća odstupanja u rječničkom razvoju djece s PSA-om promatraju se i na

Some differences at the level of word classes in English were also found in the analysis of longitudinal spontaneous speech samples of children with ASD and children with Down syndrome, matched by age and mean length of utterance (Tager-Flusberg et al., 1990). At stages where the mean length of utterance (in morphemes) is 2.0 - 2.5 and 2.5 - 3.0, children with ASD used more nouns, whereas children with Down syndrome used more closed-class words (pronouns, articles, conjunctions, prepositions, and auxiliary words). The approximate range of vocabulary at these stages was 100-200 words and 200-1000 words, respectively (Brown, 1973 according to the LAMP training module), which corresponds to the predicative and grammatical stages of vocabulary development. Despite these differences, the authors concluded that, with advanced language skills (increasing mean length of utterance and vocabulary size), the proportion of nouns decreases, and the proportion of verbs and closed-class words increases, confirming the general developmental patterns found in TD children. The differences observed at some stages are interpreted by the authors of this study as differences in styles of language acquisition, while other researchers suggest that this may reflect deeper differences in the nature of language acquisition (Bates, Bretherton and Snyder, 1988).

Possible differences in the acquisition of word classes also provide studies suggesting that children with ASD find it difficult to acquire words with relative meanings, such as verbs and modifiers (Hobson, 1989; Menyuk and Quill, 1985) and function words (prepositions, conjunctions, and pronouns) (Ricks and Wing, 1975). A case study of a boy with ASD, aged 3.03-4.0 years, showed a predominance of nominal word types (mainly nouns) and a lower representation of words denoting actions compared to their representation in the vocabulary of TD children (Williams, 1993).

In summary, previous findings have reported that children with ASD do not show significant deviations in vocabulary composition at the level of word classes. There are data that sporadically indicate some deviations, most commonly in the representation of verbs in vocabulary composition. An overview of the research on which these conclusions are based is provided in Table 2.

Tablica 2. *Sažeti prikaz istraživanja rječničkog razvoja u djece s PSA-om /* **Table 2.** *Summary of vocabulary development research involving children with ASD*

Name of study	Number of ASD children	Age of ASD children (years)	Research method	Control groups	Criteria for groups equalizing	Vocabulary size	Language	Vocabulary level	Conclusions on vocabulary development
Tager-Flusberg et al., 1990	6 boys	3.4–7.7	Speech samples	Down syndrom	Mean length of utterance	-	English	Word classes	Delayed, but not deviant
Williams, 1993	1 boys	3.3–4.0	Parent report	Typical development, Down syndrome, ASD	Vocabulary size	1–50 (100)	English	Word classes, Word level	Possibly deviant (smaller proportion of action words in ASD)
Charman et al., 2003	134 (116 boys)	1.6–7.4	Parent checklist	Typical development	Vocabulary size	1–50+	English	Semantic categories Word classes	Delayed, but not deviant
Luyster et al., 2007	93 (81 boys)	0.8–6.0	Parent checklist	Developmental delay; typical development	Nonverbal mental age	M=24 (102)	English	Word classes	Delayed, but not deviant
Ellis Weismer et al., 2011	40 (35 boys)	1.11–3.1	Parent checklist	Late talker	Vocabulary size	17–298	English	Semantic categories	Delayed, but not deviant
Rescorla and Sayfer, 2013	67 (56 boys)	1.6–5.11	Parent checklist	Typical development	Vocabulary size	1–49 (310)	English	Semantic categories, Word classes, Word level	Delayed, but not deviant
Lazenby et al., 2016	43 (31 boys)	0.11–1.1	Parent checklist	Infants with low-risk, non-ASD	Chronological age	M=2.05	English	Word level	Some qualitative differences at the word level
Su et al., 2018	160 (141 boys)	1.5–6.11	Parent checklist	Typical development	Vocabulary size	0–229, 265–498, 518–790	Mandarin Chinese	Word classes	Possibly deviant (smaller proportion of action words in ASD)
Jimenez et al., 2020	118	1–7	Parent checklist	Typical development; late talker	Vocabulary size	1–75 (250)	English	Semantic categories, Word classes	Delayed, possibly deviant (greater proportion of verbs in ASD)

razini udjela riječi u različitim semantičkim kategorijama. Istraživanja usmjerena na ovo pitanje pokazuju kako se djeca s PSA-om ne razlikuju u udjelu riječi u pojedinim semantičkim kategorijama od djece tipičnog razvoja (Charman i sur., 2003; Rescorla i Sayfer, 2013) ili od djece koja kasnije progovaraju (Ellis Weismer i sur., 2011), izjednačene prema veličini rječnika. Obje skupine koriste najviše riječi iz kategorija hrane, radnji, dijelova tijela, osoba i drugoga (npr. slova, brojevi) (Rescorla i Sayfer, 2013). Neke razlike pronađene između djece s PSA-om i djece koja kasnije progovaraju u kategorijama kućnih predmeta, životinja, igračaka i vozila autori tumače razlikama u dobi istraživanih skupina (Jiménez i sur., 2020).

Istraživanja na razini pojedinačnih riječi koje koriste djeca s PSA-om malobrojna su, a rezultati oprečni. Pokazalo se tako da djeca s PSA-om upotrebljavaju značajno manje riječi koje opisuju mentalna stanja (npr. *znati, zaboraviti, sjetiti se, razumjeti* i sl.) te prizivanje pažnje (npr. *gledati, vidjeti*) (Tager-Flusberg, 1992). Uporaba tih riječi povezuje se s teorijom uma u kojoj djeca s PSA-

SEMANTIC CATEGORIES AND THE MOST FREQUENT WORDS USED BY CHILDREN WITH ASD

In addition to research on vocabulary composition at the level of the proportion of word classes, possible deviations in the vocabulary development of children with ASD are also observed at the level of the proportion of words in different semantic categories. Research addressing this issue shows that children with ASD do not differ from TD children with the same vocabulary size in the proportion of words in certain semantic categories (Charman et al., 2003; Rescorla and Sayfer, 2013), or from children who begin speaking later (Ellis Weismer et al., 2011). A large proportion of words used by these groups of children belong to the categories of food, actions, body parts, people, and others (e.g., letters, numbers) (Rescorla and Sayfer, 2013). Some differences found between children with ASD and late talkers in the categories of household items, animals, toys, and vehicles can be interpreted as the influence of differences in age (Jiménez et al., 2020).

om pokazuju teškoće (Baron-Cohen, 2001). Slično tome pronađeno je kako djeca s PSA-om usvajaju manje tzv. socijalnih glagola (npr. *poljubiti, zagrliti, pomoći, dijeliti, voljeti*) (Jiménez i sur., 2020). Jednim istraživanjem ustanovljeno je kako se od 36 najčešće korištenih riječi u djece tipičnog razvoja samo pet preklapa s najčešće korištenim riječima djeteta s PSA-om (Williams, 1993). U pilot-istraživanju hrvatskog jezika preklapanje se pokazalo u jednoj (riječ *ne*) od sedam najčešće korištenih riječi (Popčević, Rosandić i Ivšac Pavliša, 2019). Pokazalo se kako već u dobi od 12 mjeseci djeca s PSA-om pokazuju veću tendenciju proizvodnje nekih riječi u odnosu na djecu s niskim rizikom za PSA ili bez PSA-a (Lazenby i sur., 2016). S druge strane postoje podatci koji pokazuju kako se riječi s najvećom učestalošću uporabe u djece s PSA-om uglavnom preklapaju s riječima s najvećom učestalošću uporabe u djece tipičnog razvoja (Rescorla i Sayfer, 2013). Podatci najrelevantnijih istraživanja prikazani su u Tablici 2.

Sažeto, istraživanja semantičkih kategorija riječi pokazuju kako djeca s PSA-om usvajaju suštinski iste riječi kao i djeca tipičnog razvoja, uz kašnjenje, ali ne i odstupanje u leksičkom sastavu. Istraživanja na razini pojedinačnih riječi te učestalosti uporabe pokazuju kako je rječnik djece s PSA-om često specifičan. Valja naglasiti kako su spomenuta postojeća istraživanja temeljena uglavnom na ljestvicama koje ispunjavaju roditelji te da bi se od njih mogli razlikovati podatci dobiveni spontanim jezičnim uzorcima. Naime na listama riječi roditelji mogu označiti samo one riječi koje su ponuđene, dok spontani jezični uzorci pružaju uvid u širu spontanu djetetovu proizvodnju koja bi mogla obuhvatiti i semantičke netipičnosti u rječniku koje nisu dio ljestvica. Pomoću njih bi se mogao dodatno dobiti i podatak o učestalosti uporabe riječi iz pojedine semantičke kategorije. Među deset najčešćih glagola u hrvatskom dječjem jeziku nalaze se glagoli *gledati, vidjeti i znati* (Hržica, 2007) te se pretpostavlja kako bi na većem uzorku djece s PSA-om koja usvajaju hrvatski jezik te riječi mogle biti uzrok nepodudaranja u uporabi najčešćih riječi u odnosu na djecu TR-a.

Research on the level of individual words used by children with ASD is limited and the results of these studies are inconsistent. For example, children with ASD have been shown to use significantly fewer words to describe mental states (e.g*., know, forget, remember, understand*) and to attract attention (e.g., *look, see*) (Tager-Flusberg, 1992). The use of these words has been associated with a theory of mind in which children with ASD show difficulties (Baron-Cohen, 2001). Similarly, it was found that children with ASD acquire fewer highly social verbs (e.g., *kiss, hug, help, share, love*) (Jiménez et al., 2020). One study found that, of the 36 most frequently used words by TD children, only five matched the most frequently used words by a child with ASD (Williams, 1993). In a pilot study in Croatian, an overlap was found only in one word ("*no*") of the seven most frequently used words (Popčević, Rosandić and Ivšac Pavliša, 2019). It has been shown that as early as 12 months of age, children with ASD are more likely to produce some words compared to children at low risk for ASD or those without ASD (Lazenby et al., 2016). On the other hand, words that are used with the highest frequency among children with ASD generally overlap with the words used with the highest frequency among TD children (Rescorla and Sayfer, 2013). The data of the most relevant research on this topic is summarized in Table 2.

In summary, research on semantic categories of words shows that children with ASD use essentially the same words as TD children: there may be a delay, but there is no divergence in lexical composition. Research at the level of single words and frequency of use shows that the vocabulary of children with ASD is often specific. It should be emphasised, however, that the aforementioned studies are mainly based on checklists completed by parents, and that data obtained from spontaneous speech samples may differ. This is because parents can only tick the words provided on the word lists, whereas spontaneous speech samples can provide further insight into the child's broader spontaneous production, which may include semantic atypicality's in the vocabulary that are not included in the checklists. They can be used to provide additional data on the frequency of use of words from a

RASPRAVA I ZAKLJUČAK

Istraživanja usmjerena na rani rječnički razvoj djece s PSA-om uglavnom su dio istraživačkog problema koji se odnosi na kašnjenje i/ili odstupanje u ranom jezičnom razvoju djece s PSA-om.

Pregledom dosadašnjih istraživanja koja se većinom odnose na djecu s PSA-om koja usvajaju engleski jezik, može se zaključiti kako se rječnik djece s PSA-om u najvećem broju slučajeva razvija uz kašnjenje. To podrazumijeva sporije usvajanje novih riječi u ranoj dobi, što se onda odražava i u veličini rječnika manjoj od očekivanja za kronološku dob. Specifičnosti koje obilježavaju to kašnjenje pronalaze se u većem zaostajanju u odnosu na neverbalnu mentalnu dob te u odnosu na djecu koja kasnije progovaraju. Istraživanja rječničkog sastava uglavnom izvještavaju o nepostojanju značajnih razlika prema udjelu vrsta riječi u odnosu na kontrolne skupine. Ipak, budući da su istraživanja pretežno usmjerena na rane faze rječničkog razvoja (veličine rječnika do 50 riječi) taj zaključak pouzdaniji je upravo za tu najraniju fazu, dok ostaje potreba za istraživanjem pojedinačnih, specifičnih i kasnijih faza rječničkog razvoja (predikativnu i gramatičku). Prema udjelu pojedinih semantičkih kategorija riječi djeca s PSA-om ne pokazuju odstupanja od tipičnog razvoja. Ipak, valja se osvrnuti na metodološko pitanje i naglasiti kako su ti zaključci potvrđeni uglavnom na listama riječi koje označavaju roditelji što bi moglo „zamaskirati" pravu sliku o uporabi riječi djece s PSA-om (Ellis Weismer i sur., 2011). Istraživanja na razini pojedinačnih riječi nisu česta te se prema nekima od njih može zaključiti kako je rječnik djece s PSA-om u nekoj mjeri kvalitativno drugačiji.

Sveukupno podatci iz literature idu u prilog pretpostavci kako kod većine djece s PSA-om rječnički razvoj teče usporeno, dok za pretpostavku o specifičnim odstupanjima u rječničkom sastavu postoji manji broj dokaza. Rezultati prikazanih istraživanja idu u prilog pretpostavci kako teškoće u socijalnoj komunikaciji djece s PSA-om pridonose kašnjenju u rječničkom razvoju te kvalitativnim razlikama u zastupljenosti pojedinih riječi (npr. manjoj zastupljenosti glagola koji ozna-

particular semantic category. For example, the ten most frequent verbs in Croatian children's vocabularies include "*see*", "*look*" and "*know*" (Hržica, 2007). It is hypothesised that, in a larger sample of Croatian-speaking children with ASD, these words could be the cause of a discrepancy in a comparison of the frequency of word usage between children with ASD and TD children.

DISCUSSION AND CONCLUSION

Research focusing on the early vocabulary development of children with ASD involves research questions related to delays and/or deviations in the early language development of these children.

A review of previous findings, mainly related to English-speaking children with ASD, suggests that in most cases the vocabulary of children with ASD develops with a delay. This indicates that new words are acquired more slowly at an early age, which consequently results in a smaller vocabulary size than expected for their chronological age. This delay is characterised by a greater delay relative to their nonverbal mental age and to children who begin speaking later. Studies on vocabulary composition generally report no significant differences in the proportion of word classes compared to control groups. However, since these studies mainly focus on the early stages of vocabulary development (vocabulary range up to 50 words), this conclusion is more reliable for the earliest stage of development. Therefore, there is a need to study individual, specific, and late-stage changes in vocabulary development (predicative and grammatical). As far as the proportion of each semantic category of words is concerned, children with ASD do not show any deviations from TD children. However, it is necessary to address the methodological issue and emphasise that these conclusions are mainly based on parent-reported word lists, which may "mask" the true picture of word usage in children with ASD (Ellis Weismer et al., 2011). Studies conducted at the single word level are not common, and according to some of them, the vocabulary of children with ASD often shows qualitative differences.

Overall, data from the literature supports the assumption that vocabulary development is slow

čavaju mentalne i socijalne koncepte), ali se čini da ne podrazumijevaju značajna odstupanja na razini vrsta riječi u rječničkom sastavu. Moguće je da neki drugi mehanizmi imaju značajniju ulogu u usvajanju gramatike jezika. Ipak, dalje valja istraživati moguća odstupanja u rječničkom sastavu na koja upućuju neka istraživanja djece s PSA-om, poput razlika u zastupljenosti glagola u nekim fazama jezičnog razvoja. Potrebna su dodatna eksperimentalna istraživanja kojima bi se razjasnilo zašto se ova odstupanja javljaju (Jiménez i sur., 2020).

Osim potrebe za detaljnijim objašnjenjem mehanizama koji su u podlozi ovih razlika postoji i potreba za daljnjim istraživanjima rječničkog sastava djece s PSA-om u jezicima koji se razlikuju od engleskog (Williams, 1993). Ta potreba proizlazi iz ustanovljenih razlika u rječničkom sastavu djece TR-a u različitim jezicima, manjka istraživanja rječničkog razvoja djece s PSA-om u drugim jezicima te iz oprečnih rezultata o zastupljenosti glagola u rječnicima djece s PSA-om u različitim jezicima (npr. engleskom i mandarinskom). Usmjerenost na zastupljenost glagola mogla bi biti od posebnog značaja u djece s PSA-om koja usvajaju hrvatski jezik. Prema nekim istraživanjima djece TR-a hrvatski jezik obilježava visoka učestalost uporabe glagola (Kovačević i sur., 2007; Hržica, 2007; Popčević, Košutar i Hržica, 2021). U djece TR-a glagoli se nakon druge godine života počinju upotrebljavati za širi repertoar funkcija, što se odražava na porast uporabe glagola (Hržica, 2007). S druge strane jedno od glavnih obilježja djece s PSA-om jest komunikacija za suženi raspon funkcija (Wetherby i Prutting, 1984), što otvara pitanje o usvajanju i zastupljenosti glagola u hrvatske djece s PSA-om. Usmjerenost na glagole kao konceptualno složene leksičke jedinice smatra se ključnim u razumijevanju ne samo ranog leksičkog nego i gramatičkog razvoja (Tomasello, 1992) djece s PSA-om. Ovo je od posebne važnosti ako se uzme u obzir činjenica kako neka djeca s PSA-om u kasnijoj predškolskoj dobi pokazuju obilježja jezičnog poremećaja (Hržica, Ivšac Pavliša i Jezernik, 2017).

Na kraju važno je razmotriti ograničenja u danom pregledu, odnosno prepreke u uspoređiva-

for most children with ASD, while there is less evidence of specific deviations in vocabulary composition. The results our review support the assumption that difficulties in social communication of children with ASD contribute to delays in vocabulary development and to qualitative differences in the representation of individual words (e.g., lower representation of mental and social verbs), but they do not seem to imply significant deviations at the level of word classes in lexical composition. It is possible that other mechanisms play a more significant role in grammar acquisition. However, possible deviations in vocabulary, as suggested by some studies on children with ASD, such as differences in verb representation at a particular stage of language development, need further investigation. Additional experimental research is required to clarify why these deviations occur (Jiménez et al., 2020).

Apart from the need to explain the mechanisms underlying these differences, there is also a need for further research on the vocabulary of children with ASD in languages other than English (Williams, 1993). This need stems from identified differences in the vocabulary of TD children in different languages, a lack of research on the vocabulary development of children with ASD in other languages, and conflicting findings on the representation of verbs in the vocabulary of children with ASD in different languages (for example, English and Mandarin). The focus on verb representation may be of particular importance in children with ASD who are learning Croatian. According to research on TD children, Croatian is characterised by a high frequency of verb use (Kovačević et al., 2007; Hržica, 2007; Popčević, Košutar and Hržica, 2021). In TD children, verbs begin to be used for a broader repertoire of functions after the age of two, which is reflected in the increase in the use of verbs (Hržica, 2007). On the other hand, one of the main characteristics of children with ASD is communication based on a restricted range of functions (Wetherby and Prutting, 1984), which raises the question of the acquisition and representation of verbs in Croatian children with ASD. Focusing on verbs as a conceptually complex lexical unit is considered crucial to understanding the early lexical devel-

nju rezultata različitih istraživanja o rječničkom sastavu u odnosu na veličinu rječnika. Naime zastupljenost pojedine vrste riječi u nekim istraživanjima izražena je s obzirom na dob djeteta ili prosječnu duljinu iskaza, a ne na veličinu rječnika. To otežava donošenje zaključaka o povezanosti veličine rječnika i specifičnih promjena u sastavu koje se u njemu očekuju. Isto tako neka istraživanja spontanih jezičnih uzoraka o sastavu rječnika izvještavaju brojem pojavnica, a neka brojem različnica, što onemogućuje izravnu usporedbu iz razloga detaljnije opisanih u zadnjem dijelu ovog rada. Najposlije klasifikacije vrsta riječi razlikuju se od istraživanja do istraživanja pa se tako navode kategorije zatvorenih, funkcionalnih ili gramatičkih vrsta riječi koje se preklapaju, ali i razlikuju u vrstama riječi koje se ubrajaju u te kategorije.

Kliničke implikacije

Iako prema posljednjem izdanju DSM-5 (Američka psihijatrijska udruga, 2013) odstupanja u jeziku nisu navedena kao obilježje koje opisuje poremećaj iz spektra autizma, procjena jezičnih sposobnosti smatra se važnim dijelom procjene djece s PSA-om, posebno u ranoj dobi (Charman i Baird, 2002; Cepanec, Šimleša i Stošić, 2015). Procjena ranog rječničkog razvoja i prepoznavanje teškoća koje se javljaju u njemu kod djece s PSA-om posebno je važno iz aspekta logopedske intervencije (Smith i sur., 2007). Ustanovljeno je kako rana intervencija, kojom se potiču jezične sposobnosti i neverbalna komunikacija, unapređuje kasnije ishode (Stone i Yoder, 2001). Poznavanje rječničkog razvoja djece tipičnog razvoja i djece s PSA-om omogućuje oblikovanje logopedskih intervencija koje su ciljano i razvojno primjereno osmišljene, a time učinkovitije u poticanju cjelokupnog jezičnog razvoja djece s PSA-om (Park, Yelland, Taffe i Gray 2012).

Istraživanja ukazuju na to kako većina djece s PSA-om kasnije od djece TR-a počinje proizvoditi riječi. Procjenjuje se da od 25% do 30% djece s PSA-om ne razvije funkcionalni govor (Rose, Trembath, Keen i Paynter, 2016). Ovi podatci osnova su za uvođenje potpomognute komunikacije (PK) kao gotovo neizostavnog dijela rane intervencije za djecu s PSA-om. U fazi intencijske

opment and the grammatical development (Tomasello, 1992) of children with ASD. This is especially important considering that some children with ASD show characteristics of language impairment in later preschool years (Hržica, Ivšac Pavliša and Jezernik, 2017).

Finally, it is important to consider the limitations in the present review, including the difficulties in comparing the results of different studies on vocabulary composition in relation to vocabulary size. In some studies, the proportion of a particular word class is expressed in relation to the child's age or the mean length of the utterance, rather than in relation to vocabulary size. This makes it difficult to draw conclusions about the relationship between vocabulary size and the specific compositional changes expected. Similarly, some studies of spontaneous speech samples report vocabulary composition in terms of the number of tokens, while others report the number of types, precluding direct comparison for reasons described in detail in the last part of this paper. Additionally, the classification of word classes also differs from study to study. For example, word classes that fall into the categories of closed-class, functional, or grammatical words overlap, but they also differ to some extent.

Clinical implications

Although the most recent edition of the DSM-5 (American Psychiatric Association, 2013) does not list language impairment as a characteristic describing ASD, assessment of language skills is considered an important part of the assessment of children with ASD, especially at an early age (Charman and Baird, 2002; Cepanec, Šimleša and Stošić, 2015). Assessing the early vocabulary development of children with ASD and identifying their difficulties is particularly important from the perspective of speech therapy interventions (Smith et al., 2007). Early interventions that promote language abilities and nonverbal communication has been shown to improve later outcomes (Stone and Yoder, 2001). Knowledge of vocabulary development in TD children and in children with ASD allows for the design of targeted and developmentally appropriate speech therapy in-

simboličke komunikacije jedna od funkcija intervencija PK-a jest uvođenje grafičkih simbola i/ili manualnih znakova kao komunikacijskih sredstava (Cress i Marvin, 2003; Ivšac Pavliša i Jurjak, 2021; Tomić i Milković, 2021). Osim komunikacijske svrhe PK ima svoju ulogu i u poticanju jezičnog razvoja (Rosandić Grgić, 2021) zbog čega je važno promišljati o obilježjima rječničkog razvoja pri odabiru simbola za sustave potpomognute komunikacije.

U početnim fazama usvajanja govorenog jezika (veličine rječnika do 50 riječi), imenice (nazivi životinja, hrane i pića, ljudi i igračaka) prevladavaju u ukupnom rječničkom sastavu (Fenson i sur., 1994). Ovim razvojnim pokazateljima valjalo bi se voditi pri odabiru rječnika u početnim fazama usvajanja „potpomognutog jezika", odnosno odabiru grafičkih simbola za sustave PK-a. Međutim valja se prisjetiti kako imenice tada nisu jedina vrsta riječi u ranom dječjem rječniku zbog čega uz njih u komunikacijske sustave valja uključiti i druge visoko zastupljene riječi u toj fazi jezičnog razvoja. To su riječi koje označavaju radnje, igre i rutine, socijalne riječi, oponašanje zvukova i glasanje životinja, imena ljudi i mjesta (Charman i sur., 2003; Fenson i sur., 1994) te odnosne riječi (npr. *opet*, *nema*, *gore*) (Kauschke i Hofmeister, 2002). Kako veličina „potpomognutog rječnika" uz uporabu tih simbola raste do „kritične mase" od 50 do 300 riječi okvirno, dodatan naglasak valja staviti na odabir i uporabu simbola koji označavaju glagole i druge vrste riječi (Rosandić i Popčević, 2019). Zastupljenost glagola u rječnicima djece koja koriste PK od posebnog je značaja u hrvatskom jeziku koji obilježava visok udio i čestota uporabe glagola od najranijih faza jezičnog razvoja (Hržica, 2007; Popčević, Košutar i Hržica, 2021). Nadalje uvrštavanje i modeliranje uporabe zatvorenih vrsta riječi posebno je važno za djecu koja se u naprednijim fazama jezičnog razvoja nastavljaju oslanjati na sustave PK-a. U toj fazi jedan od glavnih ciljeva intervencije jest poticanje sintaktičkog razvoja za što su nužni simboli za zatvorene vrste riječi.

Pri odabiru simbola koji pripadaju različitim vrstama riječi kao okvirni putokaz može poslužiti njihova raspodjela prema veličini rječnika djece

terventions that can effectively promote the overall language development in children with ASD (Park, Yelland, Taffe and Gray 2012).

Research shows that most children with ASD begin producing words later than TD children. It is estimated that 25-30% of children with ASD do not develop functional speech (Rose, Trembath, Keen and Paynter, 2016). These data form the basis for the implementation of augmentative and alternative communication (AAC) as an essential component of early intervention for children with ASD. At the stage of intentional symbolic communication, one of the functions of AAC interventions is to provide graphic symbols and/or manual signs as communication modalities (Cress and Marvin, 2003; Ivšac Pavliša and Jurjak, 2021; Tomić and Milković, 2021). Apart from being used for communication purposes, AAC also plays a role in promoting language development (Rosandić Grgić, 2021). Therefore, when selecting symbols for AAC systems, it is important to consider the characteristics of vocabulary development.

At the initial stages of spoken language acquisition (vocabulary size up to 50 words), nouns (names of animals, food and drink, people, and toys) dominate the composition of total vocabulary (Fenson et al., 1994). These developmental indicators should be considered when selecting vocabulary in the initial stages of acquisition of 'augmented language' (i.e., when selecting graphic symbols for AAC systems). However, it should be kept in mind that nouns are not the only word class in a young child's vocabulary. Therefore, other words that are highly represented at this stage of language development should also be included in communication systems. These include words that denote actions, games, and routines, social words, imitation of animal sounds and voices, names of people and places (Charman et al., 2003; Fenson et al., 1994), and other related words (e.g., *again*, *no*, *on*) (Kauschke and Hofmeister, 2002). As the size of the "augmented vocabulary" grows to a "critical mass" of about 50 to 300 words using these symbols, additional emphasis should be placed on the selection and use of symbols denoting verbs and other word classes (Rosandić and Popčević, 2019). The presence of verbs in the vocabularies of children using AAC is of particular importance

tipičnog razvoja (Davidoff, 2018; Laubscher i Light, 2020) (Slika 1). Valja uočiti kako se navedeni podatci odnose na njihov udio u odnosu na cjelokupni rječnik, a ne na učestalost uporabe. To može značiti da se neke riječi u kategoriji glagola ili zatvorenih vrsta riječi češće upotrebljavaju nego neke imenice zbog čega im je potrebno dati dodatan naglasak u poticanju. To potkrjepljuje i lista sržnih riječi, odnosno najčešćih riječi koje u različitim kontekstima upotrebljava velik broj djece. Primjerice na listi sržnih riječi hodančadi od 24. do 36. mjeseca gotovo uopće nema imenica (Banjee, Dicarlo i Stricklin, 2007).

Uvažavanje obilježja rječničkog razvoja, osim u poticanju potpomognutog jezika, važno je i u poticanju govorenog jezika djece s PSA-om. Pri tome je važno jezičnu okolinu zasititi ne samo imenicama, tj. imenovanjem predmeta, već i uporabom glagola, tj. komentiranjem radnji i događaja. Rano poticanje jezika treba utkati u svakodnevne funkcionalne komunikacijske prilike (Charman i sur., 2003) koje prate djetetove interese i njemu važna iskustva (Light, 1997).

Metodološke implikacije u istraživanjima rječničkog razvoja

Istraživanja razvojnih putanja, veličine i sastava rječnika temelje se najčešće na analizama ljestvica u kojima roditelji označavaju riječi koje djeca proizvode ili na analizama jezičnih uzoraka dječje neposredne proizvodnje. Rezultate tih istraživanja valja interpretirati u odnosu na odabranu metodu jer zaključci mogu biti odraz korištenih jezičnih mjera, odnosno vrste podataka koje daju pojedine metode istraživanja (Pine i sur., 1996; Kauschke i Hofmeister, 2002). Primjerice, roditeljski izvještaji, kao što su Komunikacijske razvojne ljestvice Fensona i sur. (2007), daju podatak o udjelu pojedine vrste riječi u svom citatnom obliku u rječniku (izuzev pomoćnih glagola i nekih zamjenica u hrvatskoj verziji ljestvica (Kovačević i sur., 2007)). Sastav rječnika dobiven ovakvim ljestvicama naginjat će većem udjelu imenica jer su one raznovrsnija i brojnija vrsta riječi u odnosu na glagole i zatvorene vrste riječi (Bassano i sur., 1998). Primjerice u Komunikacijskim razvojnim ljestvicama imenice čine 46% svih riječi u ljestvi-

in the Croatian language, which is characterised by a high proportion and frequency of verb use from the earliest stages of language development (Kovačević i sur., 2007; Hržica, 2007; Popčević, Košutar and Hržica, 2021). In addition, the inclusion and modelling of the use of closed-class words is particularly important for children who continue to rely on the AAC system, especially in the more advanced stages of language development. At these stages, one of the main goals of intervention is to promote syntactic development, for which symbols for closed-class words are necessary.

When selecting symbols for different word classes, their distribution can serve as a guide according to the vocabulary size of TD children (Davidoff, 2018; Laubscher and Light, 2020) (Fig. 1). It should be noted that the above data refers to their proportion in relation to the total vocabulary and not to the frequency of use. This may mean that some words in the verb or closed-class categories are used more frequently than some nouns, and they need to be emphasised in the AAC intervention. This is supported by a list of core words (i.e., the most frequent words used by a wide range of children in different contexts). For example, in the list of core words used by toddlers aged 24 to 36 months, there are almost no nouns (Banjee, Dicarlo and Stricklin, 2007).

Attention to the characteristics of vocabulary development is important not only for promoting augmented language, but also for promoting spoken language in children with ASD. It is important to saturate the language environment not only with nouns (i.e., naming objects), but also with verbs (i.e., commenting on actions and events). Early language development should be embedded in everyday, functional communication opportunities (Charman et al., 2003) based on the child's interests and experiences that are important to them (Light, 1997).

Methodological implications in vocabulary development research

Studies of developmental trajectories, vocabulary size, and composition are usually based on analysis of checklists in which parents report the words produced by children or based on an analysis of speech samples produced by the children. The results of these studies should be interpret-

ci, a glagoli 23%. S druge strane analizom spontanih jezičnih uzoraka najčešće se izvještava o rječničkom sastavu u pojavnicama (engl. *token*). Pojavnica označava svako pojedinačno javljanje neke riječi u jezičnom uzorku (Jelaska, 2005), što podrazumijeva učestalost uporabe pojedine riječi. Sastav rječnika iskazan brojem pojavnica dobivenih uzorcima dječjeg jezika naginjat će zbog toga većem udjelu visokočestotnih vrsta riječi. Opisan utjecaj dviju metoda istraživanja na rječnički sastav može se uočiti usporedbom omjera imenica i glagola prema normativnim podatcima KORALJE-a za hrvatski jezik i rezultata istraživanja Hrvatskog korpusa dječjeg jezika. U prvom imenice prevladavaju nad glagolima (v. Sliku 1), a u drugom pojavnice glagola prevladavaju nad pojavnicama imenica (Kovačević i sur., 2007).

Dakle, u istraživanjima o sastavu rječnika važno je voditi računa o tome koje jezične podatke koja metoda daje, odnosno kojim se rječničkim mjerama rezultati prikazuju (kao udio natuknica, odnosno udio riječi u njihovu osnovnom obliku, ili kao udio pojavnica). Dodatan oprez potreban je u interpretaciji rezultata prikazanih pojedinim mjerama dobivenima na jezičnim uzorcima ako se uspoređuju rezultati iz engleskog jezika s jezicima koji imaju bogatu morfologiju. To se uočava posebice na mjeri broj različnica (engl. *types*). Različnica označava svaki glasovno različit oblik riječi (Jelaska, 2005) pa je zbog obilježja jezika moguće da podatci o većoj učestalosti neke vrste riječi (prikazano brojem različnica) u jezicima s razgranatom morfologijom zapravo odražavaju velik broj različitih oblika u kojima se ona javlja. Može se zaključiti kako je ta mjera u hrvatskom i sličnim jezicima ne samo odraz rječničkog razvoja, odnosno udjela pojedine vrste riječi u rječničkom sastavu, već i odraz morfoloških obilježja jezika i morfološkog razvoja. Nadalje u hrvatskom jeziku postoji velik broj homofonih oblika, i to u većoj mjeri imenica nego glagola (Jelaska, Kovačević i Anđel, 2002), što se može odraziti na manji broj različnica imenica. Zbog toga se u hrvatskom jeziku preporučuje izbjegavati ovu mjeru kao mjeru rječničkog sastava. S druge strane u engleskom jeziku, u kojem postoji značajno manji broj različitih morfoloških oblika, najčešće korištene mjere

ed in the context of the chosen method, since the conclusions may reflect the language measures used (i.e., the types of data provided by the particular research method) (Pine, Lieven and Rowland, 1996; Kauschke and Hofmeister, 2002). For example, parent reports, such as those reported in Fenson et al. (2007) as Communicative Development Inventories, provide information about the proportion of a particular word class in its citation form in the vocabulary (with the exception of auxiliary verbs and some pronouns in the Croatian version of the inventories (Kovačević et al., 2007)). The composition of vocabulary determined by such checklists will tend to have a higher proportion of nouns since they are more diverse than verbs and close-class words (Bassano et al., 1998). For example, in the Communicative Development Inventories, nouns represent 46% of all words, while verbs represent 23%. On the other hand, in the analysis of spontaneous speech samples, the composition of vocabulary is most often reported in tokens. Tokens refer to every single occurrence of a word in a speech sample (Jelaska, 2005) and indicates the frequency of word usage. The composition of vocabulary, expressed by the number of tokens in a child's speech samples, will therefore tend to increase the proportion of high-frequency word classes. The described influence of the two research methods on vocabulary becomes clear when comparing the proportion of nouns and verbs from normative data of the Communicative Development Inventories for the Croatian language and the results of the research of the Croatian corpus of child language. In the first case, nouns are more predominant (see Fig. 1), while in the second case, verb tokens predominate over noun tokens (Kovačević et al., 2007).

Therefore, when examining vocabulary composition, it is important to consider what language data the method provides (i.e., what vocabulary measures the results are reported in), such as the proportion of lemmas (i.e., proportion of words in their root form), or as a proportion of tokens. Additional caution is required when interpreting the results based on certain measures (obtained from language samples), especially when English is being compared to other languages that are morphologically rich. This is particularly evident when

rječničkog sastava jesu različnice i pojavnice. U svrhe međujezične usporedbe rječničkog sastava rezultate bi najpouzdanije bilo prikazivati u natuknicama i pojavnicama.

Zaključno, pri usporedbi rezultata različitih istraživanja preporučuje se posebno obratiti pozornost na korištene metode i mjere istraživanja rječničkog sastava te imati na umu koje podatke o rječniku one daju. Prilikom planiranja vlastitog istraživanja odabir metoda i mjera valja prilagoditi ciljevima istraživanja i dubini jezične analize. Primjerice ljestvice roditeljskih izvještaja ne daju uvid u to koliko se često neka riječ upotrebljava, a upravo je podatak o tome koje se riječi najučestalije upotrebljavaju u spontanoj jezičnoj proizvodnji jedan od najvažnijih podataka koji se tiče uporabe jezika (Tomasello, 2003). Zbog toga se uz rječničke liste preporučuju istraživanja rječničkog razvoja na jezičnim uzorcima koji daju podatke o „uporabnom" rječniku (Bassano i sur., 1998). Potonjih istraživanja manjka, a upravo podatci dobiveni njima mogu biti ključni za dobivanje potpune slike o rječničkom sastavu djece s PSA-om (Ellis Weismer i sur., 2011).

measuring the number of types. A type refers to each phonetically distinct form of a word (Jelaska, 2005), and it is possible that data on the higher frequency of a word class (indicated by the number of types) in languages with morphological richness reflect many different forms in which it occurs. It can be concluded that this measure in Croatian and similar languages reflects both lexical development (i.e., the proportion of a given word class in the lexical composition) and the morphological features of the language and morphological development. Moreover, Croatian has a large number of homophonic forms of nouns rather than of verbs (Jelaska, Kovačević and Anđel, 2002), which may be reflected in a smaller number of noun types. Therefore, in Croatian, it is recommended to avoid this measure as a measure of vocabulary composition. In English, on the other hand, where there is a much smaller number of different morphological forms, the most commonly used measures of vocabulary composition are types and tokens. For the purposes of cross-linguistic comparison of vocabulary composition, the results in lemmas and tokens would be the most reliable.

In summary, when comparing the results of different studies, it is advisable to pay particular attention to the methods and measures used to study vocabulary composition, as well as to keep in mind what kind of information they provide about vocabulary. During the planning phase of a study, the methods and measures should be chosen according to the goals of the study and the depth of the language analysis. Checklists completed by parents, for example, do not provide information about how often a word is used. However, data regarding which words are most frequently used in spontaneous speech production are among the most important in terms of language development (Tomasello, 2003). Therefore, in addition to vocabulary lists, research on vocabulary development using speech samples that provide data on "actual" vocabulary is recommended (Bassano et al., 1998). Such data is lacking, even though it can be crucial in providing a complete picture of the vocabulary composition of children with ASD (Ellis Weismer et al., 2011).

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