

# STEREOTIPNO PONAŠANJE DJECE S POREMEĆAJEM IZ SPEKTRA AUTIZMA: UČINKOVITOST BIHEVIORALNIH INTERVENCIJA

## STEREOTYPICAL BEHAVIOUR IN CHILDREN WITH AUTISM SPECTRUM DISORDER: THE EFFICACY OF BEHAVIOURAL INTERVENTIONS

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**Sažetak:** Stereotipna ponašanja pojavljuju se kod većine osoba s poremećajem iz spektra autizma (PSA) i često znatno ometaju njihovo funkcioniranje. Cilj je ovog rada prikazati najčešće korištene bihevioralne metode i postupke za redukciju stereotipija kod djece s PSA-om te sažeti rezultate recentnih sistematskih preglednih studija u kojima je procijenjena njihova učinkovitost. Rezultati recentnih preglednih studija sugeriraju da u području tretmana motornih stereotipija najviše empirijske potpore imaju antecedentni postupci mijenjanja okoline te diferencijalno potkrepljenje alternativnog ponašanja (Akers i sur., 2020), a u području tretmana vokalnih stereotipija antecedentne metode auditorne stimulacije, kao i intervencije temeljene na posljedicama (Wang i sur., 2020). U radu se raspravlja o nedostacima dosad provedenih studija učinkovitosti te su ponuđene neke smjernice za planiranje budućih istraživanja (provedba funkcionalne analize prije implementacije tretmana, provjera integriteta provedenog tretmana, ispitivanje trajnosti postignutih učinaka, provjera učinaka tretmana na druga ponašanja, generalizacije učinaka na različite lokacije, situacije i u prisustvu različitih ljudi itd.). Nadalje, za sigurnije zaključke o dokaznoj utemeljenosti pojedinih tretmana, preporuka je planirati studije učinkovitosti koje uključuju provedbu randomiziranih kontroliranih pokusa. U kliničkoj praksi, potrebno je osigurati da se djeci s PSA-om omogući pristup onim terapijskim postupcima koji su znanstveno utemeljeni, i to pravodobno te odgovarajućim intenzitetom.

**Ključne riječi:** učinkovitost bihevioralnih intervencija, tretman stereotipnog ponašanja, stereotipije, poremećaj iz autističnog spektra, praksa utemeljena na dokazima

**Abstract:** Most individuals with autism spectrum disorder (ASD) typically exhibit stereotypical behaviours that often significantly interfere with their functioning. The aim of this paper is to provide a short overview of behavioural methods and procedures that are commonly used to reduce stereotypes in children with ASD, as well as to summarise the results of recent systematic reviews evaluating their efficacy/effectiveness. The findings of these systematic reviews suggest that, with respect to treating motor stereotypes, most empirical support is provided for altering the environment during the session and differential reinforcement of alternative behaviour (Akers et al., 2020). In the case of treatment of vocal stereotypes, empirical support for the use of auditory stimulation methods and methods based on consequences prevail (Wang et al., 2020). In this paper, the limitations of previous studies evaluating the effectiveness of behavioural interventions have been discussed and recommendations for future research projects proposed (conducting functional analysis prior to the implementation of interventions, testing the integrity of the treatment, examining long-term effects, studying the effects on other behaviours, generalisations across locations, stimuli, and people). Furthermore, in order to arrive at more accurate conclusions about the extent to which treatments are based on scientific evidence, the implementation of randomized controlled trials is recommended. In clinical practice, it is necessary to ensure that children with ASD are provided with therapeutic procedures grounded in science that can be administered in a timely manner with appropriate intensity.

**Keywords:** efficacy/effectiveness of behavioural interventions, treatment of stereotypical behaviour, stereotypes, autism spectrum disorder, evidence-based practice

## UVOD

Incidencija djece s poremećajem iz spektra autizma (PSA) raste iz godine u godinu (Rutter, 2005), a njegova je etiologija heterogena i još uvijek uvelike nerazjašnjena (Bölte i sur., 2019). Stereotipije su jedan od tri temeljna simptoma PSA-a, a prisutne su u gotovo 90% osoba s tim stanjem (Chebli i sur., 2016).

Stereotipna se ponašanja mogu definirati kao ponašanja i manipuliranje objektima koja nemaju jasnu adaptivnu svrhu (DiGennaro Reed i Lovett, 2007; Zarafshan i sur., 2017). Ona mogu biti *motor* te uključivati: (1) cijelo tijelo, npr. ljuljanje tijelom naprijed-natrag, (2) glavu, npr. kimanje glavom, (3) ruke/dlan/prste, npr. pljeskanje rukama, lepršanje, (4) kretanje, npr. skakanje, vrtnja u krug, (5) manipuliranje objektom, npr. vrtnja objekta, (6) senzorni aparat, npr. pokrivanje ušiju, žmirenje, (6) usta, npr. žvakanje i cuclanje nejestivih objekata ili dijelova tijela (Akers i sur., 2020; Lam i Aman, 2007). *Vokalne* stereotipije također su vrlo uobičajen oblik repetitivnog ponašanja u koje se ubrajaju sve bezkontekstualne vokalizacije uključujući pjevušenje, skriptiranje dijaloga iz filmova, vikanje, mumljanje i drugi repetitivni zvukovi (McNamara i Cividini-Motta, 2019). Iako istraživanja ukazuju na određenu ulogu dopaminergičkog sustava i bazalnih ganglija u izvođenju stereotipija, točni neurobiološki mehanizmi odgovorni za održavanje stereotipija u osoba s PSA-om još uvijek su nepoznati (Lanovaz i sur., 2013).

Stereotipna ponašanja ne pojavljuju se isključivo kod osoba u autističnom spektru, već se javljaju i kod osoba s drugim razvojnim poteškoćama (Bodfish i sur., 2000), no osobe s PSA-om pokazuju veću raznovrsnost, učestalost i ozbiljnost stereotipnih ponašanja (Bodfish i sur., 2000). Djeca tipičnog razvoja u ranom djetinjstvu također iskazuju neke oblike stereotipnog ponašanja, ali se učestalost takvih ponašanja znatno smanjuje nakon druge godine života (Thelen, 1981). Primjerice u jednom istraživanju djeca s dijagnozom PSA-a kao dvogodišnjaci su imali tek ponešto veće razine stereotipnog ponašanja u odnosu na neurotipične vršnjake, dok su ih u dobi od tri i četiri godine znatno nadmašili (MacDonald i sur., 2007).

## INTRODUCTION

The incidence of autism spectrum disorder (ASD) in children continues to increase (Rutter, 2005), while its aetiology remains heterogeneous and largely unclear (Bölte et al., 2019). Stereotypies are one of the three underlying symptoms of ASD and are present in nearly 90% of individuals with this condition (Chebli et al., 2016).

Stereotypical behaviours can be defined as behaviours and object manipulations with no apparent adaptive function (DiGennaro Reed & Lovett, 2007; Zarafshan et al., 2017). They can be *motor* and include: (1) the whole body, e.g. rocking the body back and forth, (2) head, e.g. nodding, (3) hands/palms/fingers, e.g. clapping, fluttering, (4) moving, e.g. jumping, spinning around, (5) object manipulation, e.g. rotating an object, (6) sensory apparatus, e.g. covering ears, squinting, and (6) mouth, e.g. chewing and sucking inedible objects or body parts (Akers et al., 2020; Lam & Aman, 2007). *Vocal stereotypies* are another common form of repetitive behaviour and include all non-contextual vocalisations such as humming, scripting dialogues from movies, shouting, mumbling, and other repetitive sounds (McNamara & Cividini-Motta, 2019). Although research suggests that the dopaminergic system and the basal ganglia play a specific role in stereotypies, the exact neurobiological mechanisms responsible for the stereotypy maintenance in individuals with ASD remain unknown (Lanovaz et al., 2013).

Stereotypical behaviours do not occur exclusively in people with ASD, but also in individuals with other developmental disabilities; however, those with ASD show a greater diversity, frequency, and severity of stereotypical behaviours (Bodfish et al., 2000). Typically developing children also exhibit some forms of stereotypical behaviour in early childhood, but the frequency of such behaviours decreases significantly after the second year (Thelen, 1981). For example, in one study, children diagnosed with ASD showed only slightly higher levels of stereotypical behaviour as two-year-olds compared to their neurotypical peers, while they significantly outperformed them at the age of three and four (MacDonald et al., 2007).

Stereotipije se javljaju i kod odraslih osoba tipičnog razvoja (Bodfish i sur., 2000), a neki primjeri uključuju tapkanje nogama, grickanje noktiju, pušenje, stiskanje bubuljica i pjevušenje. Ova ponašanja, zbog svoje relativno visoke pojavnosti, percipiraju se kao uobičajena te time ilustriraju značaj društvenih normi prilikom tumačenja stereotipnih ponašanja. Također tijekom procjene ponašanja uzimaju se u obzir i razvojne norme. Tako su u jednoj studiji (Smith i Van Houten, 1996) vrlo slična stereotipna ponašanja djece sa zaostajanjem u razvoju ocijenjena kao bizarnija u odnosu na ponašanja mlađe skupine neurotipične djece konkordantne po mentalnoj dobi.

Unatoč nejasnoj adaptivnoj funkciji stereotipije opstaju u repertoaru ponašanja pojedinca jer predstavljaju oblik samo-stimulacije koja proizvodi perceptivnu ugodu, tj. ima automatsko senzorno potkrepljenje (Lovaas i sur., 1987). No Cunningham i Schreibman (2008) iznose kritiku učestale upotrebe termina „stereotipija“ i „samo-stimulirajuće ponašanje“ kao sinonima jer se time implicira da je funkcija stereotipije isključivo samo-stimulirajuća. Naglašavaju da neka od tih ponašanja mogu biti (dodatno) operantno uvjetovana izvanjskim socijalnim potkrepljenjem (Durand i Carr, 1987), stoga je prije odabira tretmana potrebno ispitati funkciju stereotipije putem *funkcionalne analize ponašanja*.

Funkcija stereotipije može biti kompleksna te uključivati sljedeće varijable koje pridonose njezinu održavanju (Carr, 1994): (1) socijalna pažnja (socijalno posredovano pozitivno potkrepljenje), (2) *izbjegavanje* zadataka/zahtjeva ili *izbjegavanje* socijalne pažnje (socijalno posredovano negativno potkrepljenje), (3) *pristup konkretnim* predmetima ili događajima (socijalno posredovano pozitivno potkrepljenje), (4) *otklanjanje fizičke nelagode* ili boli (negativno potkrepljenje) i (5) *automatsko senzorno* (pozitivno) potkrepljenje. Pregledom istraživanja ustanovljeno je da se otprilike 90% stereotipnog ponašanja održava putem automatskog senzornog potkrepljenja (Akers i sur., 2020), dok oko 6% ukazuje na neki oblik *izbjegavanja*. No treba istaknuti da je među dostupnim studijama koje se bave učinkovitošću bihevioralnih tretmana stereotipija u svega 40%

Stereotypies also occur in adults of typical development (Bodfish et al., 2000), and some examples include tapping feet, biting nails, smoking, squeezing pimples, and humming. However, due to their relatively high incidence, these behaviours are perceived as common, thus illustrating the importance of social norms in interpreting stereotypical behaviours. Developmental norms are also taken into account during behavioural assessment. For example, stereotypical behaviours of children with developmental delays were rated as more bizarre than very similar behaviours of a mental age-concordant group of younger neurotypical children (Smith & Van Houten, 1996).

Despite the lack of clarity regarding their adaptive function, stereotypies persist in an individual's repertoire of behaviour because they represent a form of self-stimulation that produces perceptual pleasure, i.e. automatic sensory reinforcement (Lovaas et al., 1987). However, Cunningham and Schreibman (2008) criticized the synonymous use of the terms “stereotypies” and “self-stimulating behaviour”, since this implies that the function of stereotypies is exclusively self-stimulating. They emphasised that some of these behaviours may be (additionally) operantly conditioned by external social reinforcers (Durand & Carr, 1987). Thus, prior to choosing a treatment, the function of stereotypy should be assessed through *functional behaviour analysis*.

The function of the stereotypy can be rather complex and include the following variables that contribute to its maintenance: (1) social *attention* (socially mediated positive reinforcement), (2) *avoidance* of tasks or avoidance of social attention (socially mediated negative reinforcement), (3) access to *tangible* objects or events (socially mediated positive reinforcement), (4) elimination of *physical discomfort* or pain (negative reinforcement), and (5) *automatic sensory* (positive) reinforcement (Carr, 1994). A systematic review found that approximately 90% of stereotypical behaviour was maintained through automatic sensory reinforcement (Akers et al., 2020), while about 6% indicated some form of avoidance. However, it should be noted that only about 40% of all available studies dealing with behavioural treatment of

provedena prethodna funkcionalna analiza, dok u 60% studija to nije učinjeno (Akers i sur., 2020; DiGennaro Reed i sur., 2012).

Stereotipije zauzimaju veliku proporciju ponašajnog repertoara djece u autističnom spektru (Rapp i Vollmer, 2005) te često izravno *ometaju proces učenja*. Utvrđeno je da djeca koja pokazuju visoku razinu stereotipnog ponašanja teško uče jednostavne zadatke diskriminacije (Koegel i Covert, 1972), rijetko pokazuju spontanost u igri (Koegel i sur., 1974) te imaju duže odgode odgovora na osjetilne podražaje (Lovaas i sur., 1971). Moguće je da se interferencija s učenjem događa zbog intenzivne usredotočenosti na samu stereotipiju, na što ukazuju rezultati istraživanja gdje su djeca s intelektualnim poteškoćama intenzivno vizualno pratila svoje stereotipno ponašanje, dok su se kod mlađe djece neurotipičnog razvoja stereotipije u većoj mjeri odvijale sporadično (Smith i Van Houten, 1996).

Osim na kognitivne procese repetitivna ponašanja negativno utječu i na *socijalizaciju*. Neobičnost stereotipija čini ih socijalno stigmatizirajućima za djecu jer ih okolina često percipira bizarnima (Smith i Van Houten, 1996). Zbog toga njihovi roditelji često osjećaju nelagodu kad ih vode na različita javna mjesta (Cunningham i Schreibman, 2008), kao što su priredbe, kazališta, kina, trgovine, dječji rođendani itd. Nadalje, stereotipija koči uključenost u prikladna ponašanja i može biti ometajuća za okolinu (Athens i sur., 2008).

Čini se da stereotipno ponašanje ima veliki utjecaj i na *obiteljsko funkcioniranje*. Tako se učestalost repetitivnih ponašanja djeteta pokazala kao jedan od najznačajnijih prediktora roditeljskog doživljaja negativnog utjecaja podizanja djeteta s PSA-om na druge aspekte života, kao što su financijsko stanje, odnos s partnerom, slobodne aktivnosti te fizičko i mentalno zdravlje (Bishop i sur., 2007). Također, u jednoj kvalitativnoj studiji, braća i sestre navode nelagodu zbog bizarnog ponašanja svojeg brata s PSA-om u javnosti kao jedan od vrlo izazovnih aspekata suživota (Hinek i Tokić Milaković, 2019).

stereotypies included such a functional analysis, while around 60% did not (Akers et al., 2020; DiGennaro Reed et al., 2012).

Stereotypies occupy a large proportion of the behavioural repertoire of a child on the autism spectrum (Rapp & Vollmer, 2005) and often directly *interfere with the learning process*. Children who show high levels of stereotypical behaviour have been found to have difficulties related to learning simple discrimination tasks (Koegel & Covert, 1972), rarely show spontaneity in play (Koegel et al., 1974), and have longer delays in responding to sensory stimuli (Lovaas et al., 1971). It is possible that learning interference occurs due to an intense focus on the stereotypy itself. This is indicated by the results of a study where children with intellectual disabilities intensively visually monitored their stereotypical behaviour, while in their younger neurotypical counterparts stereotypies occurred sporadically (Smith & Van Houten, 1996).

Apart from cognitive processes, repetitive behaviours also negatively affect *socialisation*. The peculiarity of stereotypies makes them socially stigmatising for children, because the social environment often perceives them as bizarre (Smith & Van Houten, 1996). As a result, their parents often feel uncomfortable taking them to public places (Cunningham & Schreibman, 2008), such as performances, theatres, cinemas, shops, and children's birthday parties. Furthermore, stereotypies hinder an individual's involvement in appropriate behaviours and might be considered as a disturbance (Athens et al., 2008).

Stereotypical behaviour also appears to have a major impact on *family functioning*. Thus, the frequency of child's repetitive behaviours was shown to be one of the most significant predictors of parental perception of the negative impact of raising a child with ASD on other aspects of life such as financial status, relationships, leisure activities, as well as physical and mental health (Bishop et al., 2007). Furthermore, in a qualitative study, siblings reported their discomfort with respect to their brothers' bizarre behaviour in public as one of the very challenging aspects of coexistence (Hinek & Tokić Milaković, 2019).

Generalno gledajući, stereotipije često negativno utječu na učenje i socijalni kapacitet osoba s PSA-om te negativno utječu na funkcioniranje, dobrobit i razinu stresa svojih obitelji, a recentna metaanalitička studija ukazuje na povezanost učestalih motornih stereotipija s nižim kvocijentom inteligencije djece i generalno težom simptomatologijom PSA-a (Melo i sur., 2020). Iako se neki oblici i razine stereotipija mogu smatrati dijelom neuroraznolikosti (Singer, 1998, prema Singer, 2017) te pojedinci mogu imati koristi od edukacije vršnjaka i obitelji da ih prihvate, drugi mogu zahtijevati intervenciju. Posebno su zabrinjavajuće motorne stereotipije koje mogu ugroziti zdravlje ili dovesti do ozljede, kao što su udaranje dijelovima tijela o tvrdu podlogu (Akers i sur., 2020). Zbog interferencije stereotipnih ponašanja s adaptivnim funkcioniranjem osoba u autističnom spektru, kao i tendencije povećanja njihove učestalosti i intenziteta tijekom vremena (Bodfish i sur., 2000), osmišljene su brojne metode intervencije za njihovu redukciju. Cilj je ovog rada prikazati najčešće korištene biheviornalne metode i postupke za redukciju stereotipija kod djece s PSA-om te sažeti rezultate recentnih sistematskih preglednih studija u kojima je procijenjena njihova učinkovitost.

## BIHEVIORNALNE METODE I POSTUPCI ZA SMANJIVANJE STEREOTIPNOG PONAŠANJA

Jedna od obećavajućih metoda redukcije simptoma kod djece s PSA-om zasigurno je *farmakoterapija*, no unatoč tome američka Uprava za kontrolu prehrambenih i farmaceutskih proizvoda (FDA) do sada je odobrila svega dva medicinska pripravka za redukciju simptoma PSA-a – antipsihotike risperidon i aripiprazol (LeClerc i Easley, 2015). Unatoč dokazanoj efikasnosti u smanjivanju simptoma iritabilnosti i agresije ovi lijekovi nose sa sobom i mogućnost pojave brojnih nepovoljnih nuspojava kao što su povećanje tjelesne težine, pospanost, vrtoglavica, slinjenje, umor, mučnina, nesanica, a katkada i ekstrapiramidni efekti, stoga razvoj nefarmakoloških intervencija ostaje prioritet (Zarafshan i sur., 2017). Kad je riječ o nefarmakološkim metodama, literatu-

In general, stereotypies often have a negative impact on learning, the social capacity and functioning of individuals with ASD, as well as the well-being and stress levels of their families. A recent meta-analysis suggested an association between higher prevalence of motor stereotypies and severity of ASD symptoms (Melo et al., 2020). Although some forms of stereotypies can be considered as a part of neurodiversity (Singer, 1998; according to Singer, 2017) and individuals may benefit from the education of peers and families to accept them, others may require intervention. Of particular concern are motor stereotypies that can endanger health or lead to injury, such as hitting body parts against a hard surface (Akers et al., 2020). Due to the interference of stereotypical behaviours with the adaptive functioning of individuals with ASD and their tendency to increase in frequency and intensity over time (Bodfish et al., 2000), there are numerous intervention methods designed to help reduce such behaviours. The aim of this paper is to provide a short overview of frequently used behavioural methods and procedures to reduce the occurrence of stereotypies in children with ASD, and to summarize the results of recent systematic reviews evaluating the efficacy/effectiveness of these methods.

## BEHAVIOURAL METHODS AND PROCEDURES FOR REDUCING STEREOTYPICAL BEHAVIOUR

One of the promising methods of reducing symptoms in children with ASD is surely *pharmacotherapy*. However, so far, the Food and Drug Administration has approved only two medications to reduce symptoms associated with ASD - the antipsychotics risperidone and aripiprazole (LeClerc & Easley, 2015). Despite some efficacy in reducing symptoms of irritability and aggression, these medicines also produce numerous adverse side effects such as weight gain, drowsiness, dizziness, salivation, fatigue, nausea, insomnia, and sometimes extrapyramidal effects. Hence, the development of non-pharmacological interventions remains a priority (Zarafshan et al., 2017). When it comes to non-pharmacological methods, the literature is dominated by a behavioural approach, whose methods

rom dominira bihevioralni pristup čije se metode mogu ugrubo podijeliti na antecedentne tretmane i tretmane temeljene na posljedici, iako se one u praksi vrlo često isprepliću i kombiniraju.

### Antecedentni tretmani

Velik izazov intervencije u stereotipno ponašanje predstavlja to što se u mnogim slučajevima radi o automatskom potkrepljivanju (Akers i sur., 2020) te je funkcionalni potkrepljivač nedostupan i/ili nepodložan manipulaciji. Zbog toga antecedentne metode postaju sve popularnije među praktičarima jer predstavljaju preventivne strategije smanjenja stereotipnih radnji kroz mijenjanje okoline, pružanje konkurentnih izvora stimulacije i potkrepljenja te reduciranje motivacije za sudjelovanje u stereotipnim ponašanjima (Brodhead i sur., 2017).

### Mijenjanje okoline

Jedan od postupaka mijenjanja okoline jest tzv. pružanje *bezuvjetnog potkrepljenja (BP)* gdje se pristup željenom predmetu/aktivnosti daje prema određenom vremenskom rasporedu tijekom sesije, neovisno o ponašanju. Neka istraživanja pokazuju da je pritom metoda efikasnija ako se odabiru predmeti/aktivnosti koji nalikuju na senzorne posljedice što ih producira stereotipno ponašanje (npr. glazbena igračka u slučaju repetitivnih vokalizacija), nego ako se oni odabiru arbitrarno (Piazza i sur., 2000). Druga pak sugeriraju da je za efikasnost postupka ključna jačina preferencije za predmet (Ahearn i sur., 2005). Rezultati istraživanja ukazuju na efikasnost ovog tretmana kad se omogućava pristup različitim predmetima (Britton i sur., 2002), odnosno glazbi (Lanovaz i Sladeczek, 2012), no drugi pak pokazuju da unatoč očekivanom smanjenju stereotipija tijekom slušanja glazbe, nakon završetka tretmana može doći do pojačanja motornih stereotipija (Rapp i sur., 2013). Dodatna se ograničenja odnose na potencijalni gubitak efikasnosti zbog zasićenja potkrepljivačem i to što BP ne pojačava alternativni adaptivni odgovor (Lanovaz i Sladeczek, 2012).

Srodna je metoda i *obogaćivanje okoline (OO)* koja uključuje sveukupno povećanje broja

can be roughly divided into antecedent and consequence-based treatments, although in practice they are very often intertwined and combined.

### Antecedent treatments

A major challenge associated with interventions for stereotypical behaviour is that, in many cases, it is automatically reinforced (Akers et al., 2020), and the functional reinforcer is inaccessible or impossible to manipulate. As a result, antecedent methods are becoming increasingly popular among practitioners, since they represent preventive strategies to reduce stereotypical behaviours by changing the environment, providing competitive sources of stimulation and reinforcement, and reducing motivation to participate in stereotypical behaviours (Brodhead et al., 2017).

### Altering the environment

One of the procedures for changing the environment is providing *non-contingent reinforcement (NR)*, where access to the desired object/activity is given according to a specific time schedule during the session, regardless of behaviour. Some studies show that this method is more effective in cases when selected objects/activities are similar to the sensory consequences produced by stereotypical behaviour (exp. a musical toy in the case of repetitive vocalisations) than if they are chosen arbitrarily (Piazza et al., 2000). Other studies suggest that the strength of object preference is crucial for the efficacy of the procedure (Ahearn et al., 2005). Some research results indicate this type of treatment to be effective when providing access to different objects (Britton et al., 2002) or music (Lanovaz & Sladeczek, 2012), but other studies show that along with the expected reduction of stereotypies while listening to music, the increase in motor stereotypies after treatment may occur (Rapp et al., 2013). Additional limitations of the NR include the potential loss of efficacy due to reinforcement saturation and the fact that NR does not enhance the alternative adaptive response (Lanovaz & Sladeczek, 2012).

*Environment enrichment (EE)* is another similar method that includes an overall increase in the

i kvalitete potkrepljivača unutar djetetova okruženja (Brodhead i sur., 2017). OO je učinkovito u redukciji stereotipnog ponašanja u onoj mjeri u kojoj su dostupni podražaji u okolini konkurentni automatskom potkrepljenju koje pojedincu pruža stereotipno ponašanje (Rapp i Vollmer, 2005). Kad se djeci daju preferirane igračke, stereotipno se ponašanje smanji (Vollmer, Marcus, i LeBlanc, 1994), no u slučaju jako visoke preferencije može doći i do pojačanja stereotipnog ponašanja (Van Camp i sur., 2000).

Gover i suradnici (2019) pregledali su ukupno 71 studiju koja je ispitivala efikasnost OO-a i/ili BP-a kao tretmana za djecu čije je stereotipno ponašanje održavano automatskim senzornim potkrepljenjem. Kod ukupno 41% sudionika ove su metode smanjile učestalost stereotipnog ponašanja, a kombiniranje s drugim bihevioralnim postupcima povećalo je njihovu efikasnost.

### *Antecedentna tjelovježba*

*Antecedentna tjelovježba* je antecedentni tretman u kojem se nastoji umanjiti izvođenje stereotipnih radnji uključivanjem osobe u neku fizičku aktivnost (trčanje, plivanje i sl.). Istraživanja pokazuju da fizička aktivnost često rezultira smanjenjem stereotipnog ponašanja za vrijeme i nakon treninga, ali se taj rezultat ne dobiva dosljedno kod svih sudionika (za pregled vidi Morrison i sur., 2011). Čini se da efikasnost tretmana uvelike ovisi o svrhovitosti same stereotipije (npr. ako je funkcija stereotipije bijeg od zahtjeva, a vježbanje se doživljava kao zadatak, onda će postupak najvjerojatnije rezultirati povećanjem stereotipnog ponašanja) te preferenciji sudionika za određenu aktivnost (npr. netko može doživljavati plivanje ugodnom aktivnošću, a aerobik zahtjevnom). Morrison i sur. (2011) ističu važnost provođenja funkcionalne analize stereotipnog ponašanja te procjenu preferencije aktivnosti prije odlučivanja o ulasku u tretman tjelovježbom te su ovim pretkoracima postigli povoljne efekte tijekom te neko vrijeme nakon intervencije. Kontinuiran pristup vježbanju može polučiti i dugoročne efekte. Tako su npr. Bahrami i suradnici (2012) kroz 14 tjedana dinamikom od četiri puta tjedno vježbali s grupom djece u autističnom spektru Kata borilačke

number and quality of preferred stimuli within the child's environment (Brodhead et al., 2017). EE is effective in reducing stereotypical behaviour to the extent that the available stimuli in the environment are competitive with the automatic reinforcement provided by the stereotypical behaviour (Rapp & Vollmer, 2005). When children are given preferred toys, stereotypical behaviour decreases (Vollmer, Marcus, & LeBlanc, 1994), but in the case of very high preferences, stereotypical behaviour may also increase (Van Camp et al., 2000).

Gover et al. (2019) reviewed 71 studies examining the efficacy of using NR and/or EE as treatments for children whose stereotypical behaviour was maintained by automatic reinforcement. In 41% of participants, these methods resulted in decreased frequency of stereotypical behaviours, and combining these methods with other behavioural procedures increased their efficacy.

### *Antecedent exercise*

*Antecedent exercise* is an antecedent treatment in which an attempt is made to reduce the occurrence of stereotypical actions by involving the individual in some physical activity (running, swimming, etc.). Research shows that physical activity often results in reduction of stereotypical behaviour during and after training, but these results were not consistent across all participants (for a review, see Morrison et al., 2011). The effectiveness of treatment seems to depend largely on the function of the stereotype itself (e.g., if the function of the stereotype is task avoidance, and exercise is perceived as a task, then the procedure will most likely result in increased stereotypical behaviour) and the participants' preference for a particular activity (e.g., the individual may consider swimming as a pleasant activity, but aerobics demanding). Morrison et al. (2011) outlined the importance of conducting a functional analysis of stereotypic behaviour, as well as a preference assessment of activities prior to implementing the physical exercise treatment, stating that these pre-steps resulted in beneficial effects during and a little after the intervention. Continuous exposure to exercise can have long-term effects. For example,

tehnike i utvrdili značajnu redukciju u učestalosti izvođenja stereotipnih radnji u odnosu na kontrolnu grupu, čak i mjesec dana nakon prestanka intervencije.

### ***Pristup prije seanse***

Ova se metoda odnosi na davanje pristupa objektu s kojim se dijete stereotipno igra ili dopuštanje izvođenja stereotipija neposredno prije intervencije. Lang i suradnici (2010) su pokazali da ako se djeci neposredno prije intervencije dozvoli izvođenje stereotipija, ona se tijekom same intervencije u njih manje upuštaju, nego ukoliko su stereotipije prethodno blokirane. Moguće je i unutar samog tretmana odrediti periode u kojima je djetetu dozvoljeno izvođenje stereotipija. Ono što je nedostatak ove metode jest da može biti prilično vremenski neekonomična jer može proći mnogo vremena dok se postigne osjetna habituacija na stereotipiju. Primjerice, jednom je sudioniku za to trebalo čak 26 minuta (Rispoli i sur., 2014).

### ***Kontrola podražajem***

Istraživači i praktičari koriste principe fenomena kontrole podražajem (engl. *stimulus control*) kako bi ostvarili kontrolu nad stereotipnim ponašanjem koristeći različite vizualne i/ili verbalne znakove kako bi signalizirali djetetu kada je stereotipno ponašanje prikladno. Tako su O'Connor i suradnici (2011) naučili dječaka s PSA-om da u prisustvu zelene karte smije izvoditi stereotipna ponašanja, dok bi prilikom pojave crvene karte ta ponašanja bivala blokirana (rukom bi se nježno dovodile djetetove ruke u krilo ili bi se u slučaju repetitivnih vokalizacija zanimljivi objekti udaljavali). Nakon što je dijete naučilo situacijsku razliku u prisustvu crvene i zelene karte, krenula je intervencija kojom se nagrađivala djetetova samokontrola – kad bi uspio suspregnuti žudnju za stereotipijom u prisustvu crvene karte, pojavila bi se zelena karta signalizirajući dozvolu izvođenja stereotipije (O'Connor i sur., 2011). Na taj se način izvođenje stereotipija dovodi pod kontrolu određenog podražaja (karta u boji) te se samo-

Bahrami et al. (2012) practiced Kata techniques with a group of children with ASD four times a week for a period of 14 weeks and found a significant reduction in the frequency of stereotypical behaviours compared to the control group, even one month after the intervention.

### ***Pre-session access***

This method refers to giving the access to an object that the child stereotypically plays with, or allowing stereotypies to be performed just before the intervention. Lang et al. (2010) showed that, compared to when the stereotypies were blocked, if children were allowed to perform stereotypies immediately before the intervention, they become less involved in them during the intervention. It is also possible to set periods within the treatment in which a child is allowed to perform stereotypies. The disadvantage of this method is that it can be quite uneconomical, because it can take a long time to achieve habituation to stereotypy. For example, it took 26 minutes for one participant to achieve habituation (Rispoli et al., 2014).

### ***Stimulus control***

Researchers and practitioners have used the principles of the *stimulus control* phenomenon to obtain stimulus control over stereotypical behaviour using different visual or verbal cues that signal the appropriateness of performing stereotypical behaviours to a child. For example, O'Connor et al. (2011) taught a boy with ASD that stereotypical behaviours can be performed in the presence of a green card, while a red card indicated that those behaviours would be blocked (the child's hands would be gently brought to the lap). After the child had learned the situational difference in the presence of the red and green cards, an intervention rewarding the child's self-regulation was conducted: when the child managed to suppress the craving for stereotypy in the presence of a red card, a green card would appear, signalling permission to perform the stereotypy (O'Connor et al., 2011). This way, the performance of stereotypies was brought under the control of a certain stimulus (coloured card), and self-regulation was being rewarded with stereotypical behaviour itself.



kontrola može nagrađivati i samim stereotipnim ponašanjem.

Kontrola podražajem pokazala se kao vrlo važan dio efikasnog treninga suradljivosti (Borgen i sur., 2017). Trening suradljivosti (engl. *compliance*) djeteta u terapiji jedan je od važnih početnih ciljeva u okviru terapije jer je suradljivost preduvjet za učenje i funkcioniranje unutar obrazovnog sustava (vrtići i škole). Učenje diskriminacije situacija u kojima je stereotipija (ne)dozvoljena uključuje i elemente blage kazne (blokiranje stereotipije), no prednost je ove metode da nemogućnost blokiranja stereotipije od strane roditelja (npr. zbog istovremenog bavljenja drugim djetetom) neće umanjiti efikasnost terapije. Naime, dijete nauči da će biti blokirano u izvođenju stereotipije primjerice samo u prisustvu crvene karte. Lydon i suradnici (2017) sugeriraju da bi u budućim istraživanjima trebalo ispitati efikasnost kontrole podražajem u reduciranju stereotipija kad se koriste podražaji prisutni u prirodnoj okolini, a vezani uz različite osobe, lokacije i aktivnosti (npr. „kad je učitelj u prostoriji ne smijem izvoditi ovo ponašanje“ ili „mogu skakati na dvorištu, ali ne u učionici“).

### ***Ugradnja interesa u proces učenja***

S ciljem povećanja motivacije i sudjelovanja djeteta u različitim aktivnostima (konkurentnima izvođenju stereotipnih radnji), djetetovi se interesi ugrađuju u proces edukacije kroz materijale za učenje, teme socijalne interakcije i igru. Za ilustraciju, Baker i suradnici (1998) su organizirali socijalno prikladnu igru temeljenu na interesima djece s poremećajem iz spektra autizma (činjenice o SAD-u, likovi iz Disneyjevih crtića i sl.) i ova prilagodba rezultirala je poboljšanjem socijalne interakcije tijekom igre za sve sudionike. Međutim, rezultati recentne meta-analize (Ninci i sur., 2020) pokazuju da ugradnja interesa za učenike s PSA-om može biti blagotvorna (poboljšanje socijalne komunikacije i pozitivnog afekta, redukcija repetitivnog ponašanja), ali za neke učenike može biti i ometajuća te rezultirati povećanjem stereotipnog ponašanja u prisustvu interesa. Nadalje, ugradnja interesa učinkovitija je kod starije djece, djece s blažim simptomima PSA-a te u interven-

Stimulus control has proven to be a very important part of the effective compliance training (Borgen et al., 2017). Training of the child's compliance in therapy is one of the most important initial goals within an intervention, because cooperation is a prerequisite for learning and functioning within the educational system (kindergartens and schools). Learning to discriminate situations in which stereotypical behaviour is (not) allowed includes the elements of mild punishment (blocking stereotypes), but the advantage of this method is that the inability of parents to block the stereotypes (e.g., due to current involvement with another child) does not reduce the effectiveness of the intervention. Namely, the child learns that stereotypes will be blocked, for example, only in the presence of a red card. Lydon et al. (2017) suggested that future studies should evaluate the effectiveness of stimulus control to reduce stereotypes when stimuli are selected from the natural environment, especially in association with different individuals, locations, and activities (e.g., “when the teacher is in the room, this behaviour is not allowed”, or “I can jump in the yard, but not in the classroom”).

### ***Embedding interests into the learning process***

In order to establish the child's motivation and promote participation in various activities alternative to restricted and stereotypical actions, the child's interests are embedded in the educational process through learning material, social interaction, and play. For illustration, Baker et al. (1998) organised a socially appropriate play based on the interests of children with ASD (facts about the US, Disney cartoon characters, etc.) and this adjustment resulted in improved social interaction during the play for all participants. However, the results of a recent meta-analysis (Ninci et al., 2020) showed that embedding the interests of children with ASD into the learning process can be beneficial (improved social communication and positive affect, reduced involvement in repetitive behaviour), but for some learners also distracting resulting in increased stereotypical behaviour in the presence of interests. Furthermore, the incorporation of interests is more beneficial

cijama koje njeguju inicijativu učenika, u odnosu na one gdje se ispunjavaju zahtjevi instruktora. Stoga Ninci i suradnici (2020) sugeriraju oprez kod korištenja ove metode u radu s klijentima koji iskazuju visoke razine stereotipija u prisustvu objekata koji pobuđuju velik interes.

### Tretmani temeljeni na posljedici

Tretmani temeljeni na posljedici predstavljaju skup postupaka kojima se nastoji smanjiti pojavnost nepoželjnog ponašanja (npr. stereotipija) pružanjem nepovoljne posljedice i/ili nudeći alternativno ponašanje koje se potkrepljuje.

### Diferencijalno potkrepljenje

*Diferencijalno potkrepljenje (DP)* uključuje izostanak potkrepljenja ili davanje manje količine/slabije kvalitete potkrepljivača u funkciji pojave nepoželjnog ponašanja (u ovom slučaju, stereotipija), a pružanje bolje kvalitete i veće količine potkrepljivača u prisustvu prikladnog ponašanja ili odsustva nepoželjnog ponašanja (Brodhead i sur., 2017). Pritom se kao potkrepljivači koriste predmeti ili aktivnosti za koje pojedinac ima visoku razinu preferencije ili oni koji konkuriraju stereotipnim ponašanjima. Za razliku od antecedentnog tretmana mijenjanja okoline, DP omogućava uvjetni pristup željenim stavkama i taj pristup ovisi o ponašanju pojedinca. Postoji nekoliko različitih oblika DP, a razlikuju se u oblicima ponašanja koje pojedinac treba izvesti da bi dobio pristup potkrepljenju.

*Diferencijalno potkrepljenje alternativnog ponašanja (DPA)* uključuje davanje potkrepljenja ovisno o pojavi alternativnog prikladnog ponašanja. Primjerice Lang i suradnici (2014) proveli su bihevioralnu intervenciju u kojoj su poučavali troje djece s PSA-om vještinama igre igračkama i ispitali korisnost poučavanja igre kao sredstva za smanjenje stereotipija. Rezultati su pokazali da je, osim usvajanja novih vještina, nagrađivanje primjerene igre rezultiralo i popratnim smanjenjem stereotipija (Lang i sur., 2014.). Prije same intervencije potrebno je definirati željeno ponašanje i odabrati efikasan potkrepljivač koristeći *postupak procjene preferencija* (za pregled vidi Rush i sur.,

for older children and children with milder symptoms, as well as in the case of interventions that encourage student initiative rather than interventions where the instructor's demands are being met. Therefore, Ninci et. al. (2020) suggested caution when this method is used to help clients who exhibit high levels of stereotypies in the presence of objects that arouse great interest.

### Consequence-based treatments

Consequence-based treatments are a set of procedures aimed at reducing the incidence of undesirable behaviours (e.g., stereotypies) by providing adverse consequences and/or offering alternative behaviours that can be subsequently reinforced.

### Differential reinforcement

*Differential reinforcement (DR)* procedures involve withholding reinforcement, or providing less/poor quality reinforcement in the presence of undesired behaviour (in this case, stereotypies), while simultaneously providing more/better quality reinforcement in the presence of appropriate behaviour or the absence of undesired behaviour (Brodhead et al., 2017). Reinforcers are typically objects or activities associated with individual's high levels of preference or those that compete with stereotypical behaviours. In contrast to antecedent treatment of altering the environment, DR provides conditional access to desired items and this access is dependent on the individual's performance. There are several forms of DR and they differ in the forms of behaviour that an individual needs to perform in order to gain access to the reinforcer.

*Differential reinforcement of alternative behaviour (DRA)* involves providing reinforcement contingent on the occurrence of alternative appropriate behaviour. For example, Lang et al. (2014) conducted a behavioural intervention aimed at teaching toy-play skills to three children with autism and evaluated the utility of teaching play as a means to reduce stereotypy. Their results suggested that, apart from learning new skills, rewarding appropriate play resulted in concomitant reduction

2010). Također, unaprijed se određuje raspored potkrepljenja (fiksni ili varijabilni). Ukoliko željeno ponašanje još nije dio repertoara ponašanja učenika, može biti korisno da instruktor modelira poželjno ponašanje.

*Diferencijalno potkrepljenje inkompatibilnog ponašanja (DPI)* oblik je DPA-a u kojem je potkrepljivani alternativni odgovor inkompatibilan s neprikladnim ponašanjem (tj. osoba ne može izvoditi ova ponašanja istovremeno). Tako su primjerice Colón i suradnici (2012) učili djecu s PSA-om adekvatnom verbalnom odgovoru koji je potkrepljivan i korišten kao odgovor inkompatibilan s izvođenjem vokalnih stereotipija. Kao posljedica ovog postupka došlo je do redukcije vokalnih stereotipija (Colón i sur., 2012).

*Diferencijalno potkrepljenje drugog ponašanja (DPD)* odnosi se na davanje pristupa potkrepljivaču ukoliko nepoželjno ponašanje (npr. izvođenje stereotipije) izostane tijekom unaprijed određenog perioda, tj. potkrepljivanje bilo kojeg drugog ponašanja (Akers i sur., 2019). Ova se metoda koristi onda kada je teško pronaći alternativan poželjan odgovor koji bi bio inkompatibilan sa samom stereotipijom, a da pak ne utječe negativno na sam proces učenja. Tako bi primjerice za osobu koja repetitivno plješće rukama inkompatibilni alternativni odgovor bio da stavi ruke u krilo, no držanje ruku u krilu može interferirati s radnim zadatkom. U tom je slučaju primjerenije nagrađivati sam izostanak stereotipnog ponašanja nego alternativni odgovor. Također, kod automatski potkrepljivanih stereotipija može biti velik izazov identificirati odgovarajući alternativni odgovor koji bi producirao sličan oblik potkrepljenja. Gehrman i suradnici (2017) su proveli DPD postupak kod dječaka s PSA-om koji je stereotipno mahao rukama. Ukoliko dječak nije mahao rukama tijekom zadanog intervala (10 sekundi), istraživač mu je dao željeni jestivi potkrepljivač. Ako bi se pak stereotipija pojavila, istraživač bi ili odmah resetirao DPD-interval (postupak resetiranja) ili bi pustio da se DPD-interval nastavi dok ne istekne (postupak bez resetiranja). Metoda DPD-a pokazala se jednako učinkovitom u smanjenju stereotipija i u varijanti resetiranja i bez resetiranja (Gehrman i sur., 2017.). Iako se pokazala efikasnijom od antecedentnih metoda koje uklju-

of stereotypies (Lang et al., 2014). It is important that the desired behaviour is defined prior to intervention and an effective reinforcer is selected via one of the *preference assessment procedures* (for a review, see Rush et al., 2010). The reinforcement schedule (fixed or variable) is also determined in advance. In case the desired behaviour is not yet part of the student's repertoire, it can be useful that the instructor model such behaviour.

*Differential reinforcement of incompatible behaviour (DRI)* is a form of DRA where the alternative response that is being reinforced is incompatible with inappropriate behaviour (i.e., an individual cannot be engaged in both of these behaviours simultaneously). For example, Colón et al. (2012) taught children with ASD several appropriate verbal responses that were then reinforced and used as behaviours incompatible to vocal stereotypy. Consequently, this resulted in the reduction of vocal stereotypies (Colón et al., 2012).

*Differential reinforcement of other behaviours (DRO)* refers to the provision of reinforcers if inappropriate behaviours (e.g., stereotypy) did not occur for a specified time period, i.e. reinforcing any other behaviours (Akers et al., 2019). This method is used when it is difficult to find an alternative desirable response that would be incompatible with the stereotypy itself, without adversely affecting the learning process. For instance, for a person who repetitively claps his hands, an incompatible alternative response would be to put his hands on his lap, but keeping his hands on his lap could interfere with his work task. In this case, it is more appropriate to reward the absence of stereotypical behaviour rather than an alternative response. In addition, if a stereotypical behaviour is maintained by automatic reinforcement, it can be a challenge to identify an appropriate alternate response that would produce a similar form of reinforcement. Gehrman et al. (2017) implemented the DRO procedure with a boy with ASD who engaged in hand flapping. When the boy did not engage in hand flapping during the pre-set time interval (10s), the researcher provided him with a preferred edible. But, if stereotypy occurred, the researcher would either immediately reset

čaju bezuvjetno potkrepljenje, jedan je od izazova metode DPD-a potreba stalne opservacije ponašanja unutar zadanog intervala kako bi se pojedincu u prikladnom trenutku pružilo potkrepljenje (Akers i sur., 2019).

*Učenje novih vještina* u literaturi se često smješta u skupinu antecedentnih tretmana (jer se provodi i preventivno, a ne samo kao reakcija na stereotipno ponašanje), no proces učenja nove vještine gotovo neizostavno uključuje DP željenog odgovora (alternativnog stereotipiji) te zapravo predstavlja oblik DPA-a. Jedna od pretpostavki zbog čega se pojedinci s PSA-om stereotipno ponašaju jest da im nedostaje repertoar adaptivnih ponašanja potrebnih da postignu potkrepljenje (Boyd i sur., 2012). To implicira da bi učenje odgovarajućih vještina u igri i socijalnoj interakciji moglo dovesti do smanjenja repetitivnih i restriktivnih ponašanja (Lanovaz i sur., 2013). Na primjer, Loftin, Odom i Lantz (2008) su poučavali djecu s PSA-om vještinama socijalne interakcije putem davanja uputa o iniciranju interakcije, treninga s vršnjacima i treninga samomotrenja. Kao rezultat njihove intervencije, smanjile su se i motorne stereotipije, a učinci su trajali i više od mjesec dana nakon završetka tretmana. Jedna od prioritarnih životnih vještina kojoj se može poučavati dijete s PSA-om svakako je svrhovita komunikacija. Tako je primjerice u studiji slučaja s dječakom koji je bio zaokupljen vokalnim stereotipijama (čija je funkcija bila pristup konkretnim predmetima/događajima i/ili izbjegavanje zahtjeva), *trening funkcionalne komunikacije* (koristeći uređaj za produkciju govora) se pokazao korisnim u smanjenju učestalosti stereotipnih vokalizacija i povećanju samostalnog zahtijevanja u školskom okruženju i zajednici (Wu i sur., 2010).

### ***Postupci temeljeni na kazni***

Kažnjavanje je postupak u kojem nakon nepoželjnog ponašanja slijedi uklanjanje potkrepljenja ili primjena averzivnog podražaja kako bi se smanjila pojava tog ponašanja. Postupci kažnjavanja kontroverzna su tema i po pitanju etike primjene i po pitanju procjene njihove učinkovitosti (DiGennaro Reed i Lovett, 2007). Osnovni etički standardi za svakog terapeuta koji pomaže ljudima uključuju sljedeće smjernice (Cooper i sur., 2007,

the DRO interval (resetting procedure), or let the DRO interval continue until it expired (non-resetting procedure). The authors showed that the DRO method was equally effective to reduce stereotypy in both the resetting and the non-resetting procedures (Gehrman et al., 2017). Although DRO has proven to be more effective than antecedent methods involving non-contingent reinforcement, one of the challenges of the DRO is the need for constant observation of the behaviour in question within a given time interval to provide reinforcement at the appropriate time (Akers et al., 2019).

*Learning new skills* is often grouped within antecedent treatments in literature (because it is carried out as a preventive procedure, not just as a reaction to stereotypical behaviour), however, the process of learning new skills almost inevitably involves DR of the desired response (alternative to stereotypies) and actually represents DRA. One of the hypotheses why individuals with ASD behave stereotypically is that they lack the repertoire of adaptive behaviours necessary to obtain reinforcement (Boyd et al., 2012). This implies that learning appropriate skills in play and social interaction might lead to a reduction in repetitive and restrictive behaviours (Lanovaz et al., 2013). For example, Loftin, Odom, and Lantz (2008) taught children with ASD social interaction skills by giving them instructions on initiating interaction, providing training with peers, and self-monitoring training. As a result of their intervention, motor stereotypies decreased, and the effects persisted for more than a month after the end of the treatment. One of the priority life skills that a child with ASD can be taught is purposeful communication. Thus, in a case study involving a boy who engaged in vocal stereotypies out of tangible and escape reasons, *functional communication training* (using speech generating device) was useful in decreasing the frequency of stereotypical vocalisations and increasing independent requests in school and community settings (Wu et al., 2010).

### ***Punishment-based procedures***

Punishment is a procedure in which undesirable behaviours are followed by either the removal of a reinforcer or the application of an aver-

prema Akers i sur., 2019): 1) ne načiniti štetu, 2) koristiti minimalno intruzivne postupke, i 3) pružati efikasan tretman. No ove upute ne uključuju sasvim jasan model odlučivanja o tome kada je i je li primjereno koristiti metodu kazne u terapijskom tretmanu. DiGennaro Reed i Lovett (2007) su ispitali stavove primijenjenih biheviornalnih analitičara (ABA terapeuta) u SAD-u o implementaciji postupaka kažnjavanja u radu s klijentima te su pokazali da postoji određeni varijabilitet u pogledu stavova o efikasnosti korištenja kazne i o etičkim pitanjima njihove primjene (žene su u prosjeku imale negativniji stav od muškaraca). No, zaključuju da se sudionici istraživanja uglavnom slažu u sljedećem: 1) suglasnost i odobrenje nadležnih institucija nisu dovoljni da se kažnjavanje smatra etičnim, 2) kazna treba biti rezervirana za opasna ponašanja, 3) postupci kazne imaju više neželjenih efekata i manje su učinkoviti nego postupci potkrepljivanja i 4) averzivna je komponenta je uključena u mnoge tobože neaverzivne metode (DiGennaro Reed i Lovett, 2007). Kažnjavajući postupci mogu imati brojne neželjene nusprodukte kao što su porast agresivnog ponašanja i problema u ponašanju, ugrožavanje uspostavljenog odnosa, pojačanje intenziteta kazne zbog navikavanja, kazna na dijete može imati generalizirajući inhibirajući učinak, a kod neke djece može služiti i kao pozitivni potkrepljivač kroz zadobivanje tražene pažnje (za pregled vidi Lahey, 2017). Stoga Brodhead i suradnici (2017) sugeriraju da se postupci koji uključuju (blagu) kaznu koriste što rjeđe i isključivo inkorporirani u tretmanske pakete koji dominantno uključuju antecedentne metode i metode diferencijalnog potkrepljenja. U nastavku su opisani najčešće korišteni i evaluirani postupci za redukciju stereotipija koji uključuju kaznu: blokiranje odgovora, trošak odgovora te prekid i preusmjerenje odgovora.

*Blokiranje odgovora (BO)* odnosi se na nježan fizički kontakt koji se implementira s ciljem fizičkog preveniranja ili preusmjerenja stereotipne radnje. Primjerice, u slučaju ponašanja koje uključuje tapkanje prstima o podlogu, terapeut može nježno postaviti ruku između djetetove ruke i podloge i onemogućiti izvođenje stereotipije ili staviti djetetu u ruku neki drugi predmet (npr. olovku ili lopticu). Ova metoda rijetko se koristi samostal-

ive stimulus in order to reduce the occurrence of these behaviours. Punishment procedures are a controversial topic both with respect to the ethics of their use and their effectiveness (DiGennaro Reed & Lovett, 2007). The basic ethical standards for any human service provider include the following guidelines (Cooper et al., 2007, according to Akers et al., 2019): 1) do no harm, 2) use the least intrusive procedures, and 3) provide effective treatment. However, these directions do not include a clear model for deciding when and whether it is appropriate to use the punishment method in therapeutic treatment. DiGennaro Reed and Lovett (2007) examined the attitudes of applied behaviour analysts in the US on the implementation of punishment-based procedures in work with their clients and found that there was some variability in attitudes about the effectiveness of such procedures and ethical issues to their use (on average, women had more negative attitudes than men). However, participants generally agreed that: 1) consent and administrative approval are not sufficient to make the punishment procedures ethical, 2) punishment should be reserved for dangerous behaviours, 3) punishment procedures have more side-effects and are less effective than reinforcement procedures, and 4) aversive components are embedded in many supposedly non-aversive methods (DiGennaro Reed & Lovett, 2007). Punishing actions can have a number of unwanted by-products such as an increase in aggressive behaviour and behavioural problems, compromising an established relationship, increase in intensity of punishment due to habituation, punishment can have a generalising inhibitory effect on children, and in some cases, serve as a positive reinforcer through gaining attention (for a review, see Lahey, 2017). Therefore, Brodhead et. al. (2017) suggested that procedures involving (mild) punishment should be used as infrequently as possible and only incorporated into treatment packages that predominantly include antecedent and differential reinforcement methods. Below are described the most commonly used and evaluated punishment-based procedures for reducing stereotypies: response blocking, response cost, and response interruption and redirection.

no i najčešće se kombinira s različitim metodama bezuvjetnog ili diferencijalnog potkrepljenja. Iako rezultati brojnih studija ukazuju na određenu efikasnost ove metode u redukciji stereotipija tijekom tretmana, ona ima dva glavna nedostatka (Akers i sur., 2019): (1) može povećati naknadnu pojavu stereotipija ili drugih problema u ponašanju te (2) može biti vrlo iscrpljujuća za terapeuta jer zahtijeva stalnu blizinu i usmjerenost na ponašanje sudionika kako bi se odgovori dosljedno blokirali. Kombinacija BO s metodom koja uključuje kontrolu podražajem (gdje dijete uči povezati određeni podražajni znak u čijem će prisustvu stereotipije biti dosljedno blokirane) u određenoj mjeri reducira opisane nedostatke (Langone i sur., 2013).

*Trošak odgovora (TO)* je zapravo ilustracija kazne uklaňanjem te uključuje uklaňanje postojećeg pristupa objektu ili aktivnosti ovisno o prisustvu neprimjerenog ponašanja čija se učestalost nastoji umanjiti. Na primjer, dijete koje je naučeno da dobiva žetone za prikladno ponašanje može izgubiti žeton svaki put kad počne izvoditi stereotipije (Lapime i Dittrich, 2014). Postojeća istraživanja učinkovitosti ovog postupka za redukciju stereotipija također uglavnom uključuju kombinaciju s drugim metodama. Tako su npr. Falcomata i suradnici (2004) primijenili metodu bezuvjetnog potkrepljenja kako bi smanjili neprikladne vokalizacije kod mladića s PSA-om te su ustanovili da dodavanje komponente kazne kroz postupak TO-a dovodi do prihvatljivog smanjenja vokalnih stereotipija.

*Prekidanje odgovora i preusmjerenje (POIP)* metoda je koja se sastoji od prekida stereotipije i preusmjerenja pojedinca da se uključi u odgovarajuće vokalne ili motoričke zadatke (Ahearn i sur., 2007), a predstavlja proceduralnu varijaciju *blokiranja odgovora*, jer je nemoguće fizički blokirati vokalnu stereotipiju. Primjerice, u slučaju pojave vokalne stereotipije, terapeut se uključuje postavljajući uzastopno tri jednostavna pitanja za koja je siguran da dijete na njih može odgovoriti (npr. *Kako se zoveš?*, *Koja je ovo boja?*) ili dajući jednostavne zahtjeve da dijete nešto ponovi (npr. *Reci „mama“*) te potkrepljujući dane odgovore. Na taj je način dijete uključeno

*Response blocking (RB)* refers to gentle physical contact aimed at physically preventing or redirecting a stereotypical action. For example, in the case of the behaviour involving tapping with fingers on the table, the therapist may gently place own hand between the child's hand and the surface, or stop the stereotypy by offering some object (pencil, ball) to the child. This method is rarely used alone and is most often combined with various methods of non-contingent or differential reinforcement. Although the results of many studies indicate that this method can be considerably efficient in reducing stereotypies during treatment, it has two main shortcomings (Akers et al., 2019): (1) it may increase the subsequent occurrence of stereotypies or the occurrence of other behavioural problems, and (2) it may be very exhausting for the therapist because it requires constant proximity and focus on the behaviour of the subjects in order to consistently block the responses. The combination of RB with the method involving stimulus control (where the child learns to associate a specific stimulus to the consistent blockage of stereotypies) can reduce the described shortcomings to some extent (Langone et al., 2013).

*Response cost (RC)* is an example of a punishment by removal and involves limiting current access to an object or activity contingent on the occurrence of the undesired behaviour. For example, a child who has been taught to receive tokens for appropriate behaviour may lose the token each time he or she begins to perform stereotypies (Lapime & Dittrich, 2014). This procedure is also mainly used in combination with other methods. For example, Falcomata et al. (2004) implemented the NR method to reduce inappropriate vocalisations in an individual with ASD and found that adding the punishment component through the RC method led to an acceptable reduction in vocal stereotypies.

*Response interruption and redirection (RIRD)* is a method that consists of interrupting the stereotypies and redirecting the individual to engage in appropriate vocal or motor tasks (Ahearn et al., 2007), and it is a procedural variation of RB, since it is impossible to physically block vocal stereo-

u proces odgovaranja koji je inkompatibilan s nastavkom vokalne stereotipije. Umjesto verbalnih zahtjeva može se koristiti i davanje jednostavnih zahtjeva motoričkog tipa koji uključuju upotrebu imitacije (inkompatibilan odgovor koji je podudaran stereotipiji), npr. ako osoba plješeće, može dobiti uputu: „Daj pet!“.

Spencer i Alkhanji (2018) su, pregledavši studije djelotvornosti POIP metode u redukciji vokalnih stereotipija, zaključili da je ona prilično uspješna u redukciji vokalnih stereotipija i povećanju učestalosti primjerenih vokalizacija. No, zaključuju i da su potrebna dodatna istraživanja zbog nedostatka podataka o efikasnosti ove metode u prirodnom okruženju (McNamara i Cividini-Motta, 2019) kao i postojanosti terapijskih učinaka tijekom vremena (Cunningham i Schreibman, 2008).

## **EVALUACIJA UČINKOVITOSTI BIHEVIORALNIH INTERVENCIJA**

Većina studija koje ispituju učinkovitost različitih tretmana za redukciju stereotipnog ponašanja provedene su kao studije slučaja i uključuju jednog ili svega nekoliko sudionika. Zbog toga je neophodno provoditi sustavne pregledne studije u kojima se zajednički sagledava veći broj pojedinačnih studija i donose zaključci o efikasnosti pojedinih tretmana, ali i valjanosti provedenih studija učinkovitosti. Unutar ovog poglavlja sažeti su rezultati recentnih sistematskih preglednih studija koje su se bavile učinkovitošću različitih biheviornih tretmana za smanjenje stereotipija.

DiGennaro Reed i suradnici (2012) pregledali su 62 empirijske studije koje su se bavile evaluacijom neke biheviornalne intervencije za smanjenje stereotipija kod djece s PSA-om ili drugim pervazivnim razvojnim poremećajem. Pronašli su da je planiranje intervencija rijetko bilo vođeno funkcionalnom analizom ponašanja, a najčešće korištene metode bile su metode bazirane na posljedici (oko 50%) ili metode koje sadrže kombinaciju antecedentnih i metoda temeljenih na posljedici (oko 27%). Također, autori upozoravaju na rijetku procjenu integriteta tretmana, što ograničava replikabilnost rezultata.

For example, if a child engages in vocal stereotypy, the therapist engages with the child by consecutively asking three simple questions that he/she is sure that child can answer (e.g., What's your name?, What colour is this?), or by giving simple repeat requests (e.g., Say "mom") and subsequently reinforcing the given responses. This way, the child engages in process of responding that is incompatible with the engagement in vocal stereotypies. Instead of verbal requests, simple motor-type requests involving the use of imitation (incompatible to stereotypy) can also be used (e.g., if a child stereotypically claps hands, he or she may be instructed: "Give me five!").

Spencer and Alkhanji (2018) reviewed studies that examined the efficacy of the RIRD method in reducing vocal stereotypies and concluded that this method can be quite effective in reducing vocal stereotypies and increasing the frequency of appropriate vocalisations. However, they also concluded that additional research is required due to the lack of data on the effectiveness of this method in the natural environment (McNamara & Cividini-Motta, 2019), as well as the durability of associated therapeutic effects (Cunningham & Schreibman, 2008).

## **EVALUATION OF THE EFFICACY OF BEHAVIOURAL INTERVENTIONS**

Most studies examining the efficacy of different treatments to reduce stereotypical behaviour have been conducted as case studies and involved only one or a few participants. Therefore, it is necessary to provide systematic review studies in which a larger number of studies are taken together in order to make conclusions about the efficacy of different treatments, as well as to assess the validity of the conducted efficacy studies. Within this chapter, the results of recent systematic reviews dealing with the efficacy/effectiveness of different behavioural treatments to reduce stereotypy have been summarized.

DiGennaro Reed et al. (2012) conducted a review of 62 empirical studies evaluating behavioural interventions to reduce stereotypy exhibited by children with ASD or other pervasive

Lanovaz i suradnici (2013) nastojali su utvrditi učinke postupaka za smanjenje stereotipija na učestalost izvođenja drugih ponašanja. Identificirali su ukupno 60 studija u kojima je smanjivano stereotipno ponašanje sudionika i odmjereno uključivanje u barem jedno alternativno ponašanje. Rezultati provedene analize sugeriraju da smanjivanje stereotipija rezultira preusmjeravanjem prema drugim ponašanjima, koja nisu nužno poželjna (Lanovaz i sur., 2013). Stoga, savjetuju kliničarima i istraživačima koji planiraju intervencije usmjerene na smanjivanje stereotipnog ponašanja da u tretman uključe i postupke koji podupiru izvođenje prikladnih alternativnih ponašanja te da procijene i druga ponašanja koja nisu ciljana samim tretmanom (Lanovaz et al, 2013).

Zarafshan i suradnici (2017) su pokušali sistematizirati studije intervencija za redukciju stereotipnog i repetitivnog ponašanja kod djece predškolske dobi s PSA-om. U analizu je ušlo svega 15 visokokvalitetnih studija. Autori zaključuju da se različite vrste intervencija mogu koristiti za tretman repetitivnog ponašanja, no ističu da još uvijek nema dovoljno dokaza za njihovu učinkovitost (Zarafshan i sur., 2017) jer su malobrojne one studije koje uključuju dvostruko slijepi eksperiment sa slučajnim pridjeljivanjem u kontrolnu i eksperimentalnu grupu, poznatijim kao randomizirani kontrolirani pokus (engl. *Randomized controlled trial*; RCT).

U okviru dvije recentne sistematske pregledne studije (Akers i sur., 2020; Wang i sur., 2020) korišteni su *What Works Clearinghouse* (WWC) standardi kako bi se identificirale intervencije za smanjenje stereotipija kod osoba s PSA-om koje se mogu smatrati intervencijama utemeljenim na dokazima (engl. *evidence-based*). To su intervencije s umjerenim do jakim učincima, pronađenim u najmanje 5 različitih studija, provedene s najmanje 20 sudionika od strane barem tri različita istraživačka tima (*What Works Clearinghouse*, 2017, prema Akers i sur., 2020).

Wang i suradnici (2020) odabrali su 39 studija slučaja odgovarajuće kvalitete koje su ispitivale učinke različitih intervencija na smanjenje vokalnih stereotipija. Rezultati provedene analize sugeriraju da su antecedentne metode bazirane na

development disorders. They found that intervention planning was rarely guided by functional analysis, and the most commonly used methods were consequence-based (about 50%) or methods containing a combination of antecedent and consequence-based interventions (about 27%). In addition, the authors pointed out that treatment integrity was rarely assessed, which limited the replicability of the results.

Lanovaz et al. (2013) sought to determine the effects of the procedures aimed at reducing stereotypes on engagement in other behaviours. They identified a total of 60 studies in which the participants' involvement in stereotypical behaviour was reduced and involvement in at least one alternative behaviour was measured. The results of their analysis suggest that reducing stereotypes results in redirection to other behaviours that are not necessarily desirable (Lanovaz et al, 2013). Hence, they advised clinicians and researchers who plan interventions aimed at reducing stereotypical behaviours to include procedures supporting engagement in appropriate alternative behaviours, as well as to measure other behaviours that are not targeted by the treatment itself (Lanovaz et al, 2013).

Zarafshan et al. (2017) attempted to summarise intervention studies aimed at reducing stereotypical and repetitive behaviour in preschool children with ASD. Only 15 high-quality studies were included in the analysis. The authors concluded that different types of interventions can be used to treat repetitive behaviours, but they also pointed out the current lack of evidence regarding the effectiveness of such methods (Zarafshan et al., 2017), because very few studies involved a double-blind experiment with random assignment to control and experimental group, also known as the *randomized controlled trial* (RCT).

In two recent systematic reviews (Akers et al., 2020; Wang et al., 2020) the *What Works Clearinghouse* (WWC) standards were used to identify evidence-based interventions for reducing stereotypes in individuals with ASD. Those are the interventions with moderate to strong treatment effects found in at least five different studies, conducted with a minimum of 20 participants and



auditornoj stimulaciji (npr. pristup glazbi), POIP i druge intervencije temeljene na posljedici obećavajuće metode i to s umjerenim do jakim učincima, dok metode senzorne integracije nemaju empirijsku potporu. Međutim, istraživači ističu da socijalna valjanost tretmana (prihvatljivost i subjektivno zadovoljstvo klijenata i terapeuta primijenjenim postupkom) u većini studija nije provjerena te da su većinu intervencija provodili istraživači, a ne praktičari (Wang i sur., 2020).

U sistematskoj preglednoj studiji koju su proveli Akers i suradnici (2020) odabrano je ukupno 126 studija visoke kvalitete koje su se bavile ispitivanjem učinkovitosti različitih bihevioralnih intervencija u tretmanu motornih stereotipija kod klijenata s PSA-om. Na temelju rezultata analize donijeli su zaključak da antecedentni postupci mijenjanja okoline tijekom seanse (npr. kontinuirani pristup konkurentnom podražaju) te diferencijalno potkrepljenje alternativnog ponašanja (DPA) predstavljaju intervencije utemeljene na dokazima prema WWC-standardima (Akers i sur., 2020). Nadalje, metoda POIP-a pokazala se prilično učinkovitom u smanjivanju motornih stereotipija, u skladu sa zaključcima ranije pregledne studije (Spencer i Alkhanji, 2018), ali je broj sudionika na kojem je ispitana nedovoljno velik da bi se zaključilo da se radi o praksi utemeljenoj na dokazima. Također, autori ističu da i metoda kontrole podražajem u kombinaciji s postupkom BO-a ili POIP-a ima potencijala za dodatnu provjeru kako bi se dosegli spomenuti standardi (Akers i sur., 2020).

## ZAVRŠNA RAZMATRANJA

Rezultati sistematskih preglednih studija provedenih prema WWC standardima sugeriraju da u području tretiranja *motornih* stereotipija značajnu empirijsku potporu imaju antecedentni postupci mijenjanja okoline tijekom seanse te diferencijalno potkrepljenje alternativnog ponašanja (Akers i sur., 2020), dok su u području tretmana *vokalnih* stereotipija značajnu empirijsku potporu ostvarile antecedentne metode auditorne stimulacije, POIP i intervencije temeljene na posljedicama (Wang i sur., 2020).

by at least three different research teams (What Works Clearinghouse, 2017, according to Akers et al., 2020).

Wang et al. (2020) reviewed 39 case studies of appropriate quality that examined the effects of different interventions on reducing vocal stereotypies. The results of their analysis suggest that antecedent methods based on auditory stimulation (e.g., access to music), RIRD, and other consequence-based interventions are promising and show moderate to strong effects, while sensory integration methods have no empirical support. However, the authors pointed out that the social validity of these treatments (acceptability and subjective satisfaction of clients and therapists with the applied procedure) were not verified in most of the studies, and that the implementation of most interventions had been carried out predominantly by researchers rather than practitioners (Wang et al., 2020).

In a systematic review study conducted by Akers et al. (2020), a total of 126 high-quality studies examining the effectiveness of various behavioural interventions in the treatment of motor stereotypies in clients with ASD were selected. Based on the results of the analysis, the authors concluded that antecedent procedures of altering the environment during the session (e.g., continuous access to competitive stimuli) and DRA could be considered evidence-based interventions, according to the WWC standards (Akers et al., 2020). Furthermore, the RIRD method was shown to be effective in reducing motor stereotypies, consistent with the findings of a previous review (Spencer & Alkhanji, 2018), but the number of participants examined was still insufficient to declare it as an evidence-based practice. The authors also pointed out that stimulus control in combination with response blocking procedures or RIRD has the potential for additional verification in order to reach the above-mentioned standards (Akers et al., 2020).

## FINAL CONSIDERATIONS

The results of systematic reviews conducted according to the WWC standards suggest that, in

No prilikom primjene ovih zaključaka u praksi važno je imati u vidu određena ograničenja dosad provedenih studija učinkovitosti te uzeti u obzir određene smjernice za planiranje i implementaciju budućih studija. Ponajprije, sve su studije podložne pogrešci *pristranosti objavljivanja*. Ninci i suradnici (2020) pokazali su provodeći metaanalizu objavljenih studija i neobjavljenih doktorskih disertacija da istraživanja koja pokazuju pozitivne efekte tretmana imaju mnogo veću šanse objave u znanstvenom časopisu (i shodno tome uključivanja u metaanalizu ili sistematsku preglednu studiju).

Nadalje, nedostaju podaci o *dugoročnoj učinkovitosti* ispitivanih metoda intervencije. Za većinu sudionika (91%) podaci su prikupljeni samo neposredno nakon tretmana, dok podaci o trajnosti postignutih efekata ostaju nepoznati (Akers i sur., 2020). Štoviše, u nekim se studijama pokazalo da efekti redukcije vokalnih stereotipija postignuti za vrijeme intervencije nisu opstali nakon što se tretman prestao primjenjivati (Wang i sur., 2020). Rijetki su (16%) i podaci o *generalizaciji efekata* (Akers i sur., 2020). Potrebno je provjeriti opstaje li izostanak stereotipija uslijed određenog tretmana i na drugim lokacijama (vrtić/škola, kod kuće, dvorište), u drugim situacijama i u prisustvu različitih ljudi (terapeuti, učitelji, roditelji, vršnjaci). Većinu intervencija provode istraživači te je potrebno da se u budućim studijama ispita efikasnost intervencija kad ih primjenjuju stručnjaci ili roditelji (Wang i sur., 2020).

Podaci o *izvedivosti* pojedine intervencije u realnim uvjetima također su nepoznati (Akers i sur., 2020). Npr. može biti realno očekivati od skrbnika da tijekom popodnevnih sati dosljedno provodi intervenciju kod kuće, ali nerealno da osigura adekvatnu primjenu tijekom jutarnjih sati kad je dijete u vrtiću/školi. Osim toga, ključno je provjeriti i tzv. *socijalnu valjanost* (engl. *social validity*) intervencije i samih ciljeva tretmana, tj. ustanoviti u kojoj su mjeri u skladu s vrijednostima i prioritetima obitelji (Callahan i sur., 2017). Primjerice, kad se roditelje/skrbnike pitalo za mišljenje o preferiranoj metodi za uklanjanje vokalnih stereotipija, preferencijalnu prednost su dali metodi POIP-a pred metodom TO-a ili njihovom kombinacijom

the field of interventions for *motor* stereotypies, there is considerable empirical support for antecedent procedures of altering the environment and differential reinforcement of alternative behaviour (Akers et al., 2020), while in the field of treatments of *vocal* stereotypies, antecedent methods of auditory stimulation, RIRD and consequence-based interventions received substantial empirical support (Wang et al., 2020).

However, when these conclusions are applied in practice, it is important to acknowledge certain limitations of the current efficacy studies, as well as to consider certain avenues for planning and implementing future studies. First of all, all studies are subject to *publication bias*. In a meta-analysis of published studies and unpublished doctoral dissertations, Ninci et al. (2020) demonstrated that research showing positive treatment effects had a much higher probability of being published in a scientific journal (and eventually becoming a part of a meta-analysis or systematic review).

Furthermore, there is very little data on the *long-term effectiveness* of the examined intervention methods. For the majority of participants (91%), data were collected only immediately after treatment, while the data on the permanence of the achieved effects remained unknown (Akers et al., 2020). Moreover, some studies have shown that the effects of reducing vocal stereotypies achieved during the intervention did not persist after the end of the treatment (Wang et al., 2020). Data on the *generalisation* of effects is also limited (16%; Akers et al., 2020). It is necessary to check whether the absence of stereotypies due to a certain treatment persists across locations (kindergarten/school, at home, yard), stimuli, and different people (therapists, teachers, parents, peers). Most interventions are carried out by researchers, so future studies should examine the effectiveness of interventions when they are applied by professionals or parents (Wang et al., 2020).

Data on the *feasibility* of a particular intervention in real conditions are also rather scarce (Akers et al., 2020). For example, it might be realistic to expect caregivers to consistently carry out an intervention at home during the afternoon, but unrealistic to ensure appropriate implementa-

(McNamara i Cividini-Motta, 2019). Socijalna valjanost ključna je odrednica efikasnosti samog tretmana, posebno ukoliko sami roditelji provode tretman.

Radi jednostavnije provjere učinaka tretmana, većina studija kao ciljne varijable koristi određeno stereotipno ponašanje ili vrlo specifično alternativno ponašanje (poput bavljenja zadanim predmetom). Buduća bi istraživanja trebala provjeriti imaju li opisane intervencije učinke i na neka *druga ponašanja* kao što su drugi (nemjereni) oblici stereotipija, poželjna ili pak nepoželjna ponašanja. Primjerice, pokušaji da se dijete prekine ili omete u ritualnom, stereotipnom ponašanju mogu rezultirati drugim oblicima problema u ponašanju, kao što su agresija, izljevi bijesa i samoozljeđivanje (Kuhn i sur., 2009) ili povećanjem drugih formi stereotipnih radnji (Rapp i sur., 2013). Stoga je preporučljivo uz tretman za redukciju stereotipija svakako usporedno jačati odgovarajuća alternativna ponašanja kako bi se umanjila vjerojatnost prebacivanja na nove forme problema u ponašanju (Lanovaz i sur., 2013).

Također, buduće bi studije trebale ispitati *dalekosežnije pozitivne efekte* tretmana za redukciju stereotipija na fundamentalne deficite osoba s PSA-om poput smanjenja teškoća u učenju, olakšavanje socijalne participacije i slično. Štoviše, prije korištenja opisanih biheviornalnih metoda važno je temeljito razmotriti kada je uopće potrebno intervenirati u stereotipno ponašanje, a kada intervencija nije nužna. Klijenti imaju pravo na efikasan tretman, ali imaju i pravo ne izložiti se tretmanu ukoliko on ne rezultira smislenom promjenom poput povećanja kvalitete njihova života (Weddle i Carreau, 2018). Stereotipna ponašanja neupitno zahtijevaju tretman onda kad uključuju rizik od ozljede, uništavanje imovine ili agresiju, odnosno kad znatno ometaju učenje i funkcioniranje. Ipak, Akers i suradnici (2020) zaključuju da ih nije preporučljivo svesti na nultu razinu iz nekoliko razloga: 1) jer najčešće ne predstavljaju rizik ozljede ili uništavanja imovine, 2) jer su u nekim drugim oblicima prisutne i kod neurotipičnih pojedinaca, i 3) potpuna supresija stereotipije nije samo neopravdana, već i neetična jer osobe s PSA-om imaju vrlo sužen dijapazon potencijalnih

tion during the morning hours when the child is in kindergarten/school. In addition, it is crucial to assess the *social validity* of the intervention and the goals of the treatment itself, i.e., to determine the extent to which they are in line with the values and important priorities of the family (Callahan et al., 2017). For example, when parents/caregivers were asked about their preferences with respect to a method to reduce vocal stereotypies, they said that they preferred RIRD over RC or a combination of the two (McNamara & Cividini-Motta, 2019). Social validity might be a key determinant of treatment effectiveness, especially in cases where parents are supposed to carry out the treatment themselves.

To simplify the procedure of treatment evaluation, most studies use certain stereotypical behaviour or very specific alternative behaviour (such as object manipulation) as target variables. Future research should examine whether the interventions described here have an effect on other non-targeted stereotypy topographies or *different (un)desirable behaviours*. For example, attempts to interrupt or distract a child from a ritual stereotypical behaviour may result in other forms of problem behaviour, such as aggression, outbursts, and self-harm (Kuhn et al., 2009), or increase other forms of stereotypical behaviour (Rapp et al., 2013). Therefore, in addition to reducing stereotypies, it is desirable to simultaneously strengthen appropriate alternative behaviours in order to decrease the risk of switching to some new forms of behavioural problems (Lanovaz et al, 2013).

In addition, future studies should examine more *fundamental* positive effects of treatment aimed at reducing stereotypies for people with ASD such as reducing learning difficulties, facilitating social participation, etc.. Moreover, prior to using the described behavioural methods, it is important to thoroughly consider the necessity of intervention in stereotypical behaviour. Clients have the right to receive effective treatments, but they also have the right not to be exposed to the treatment if it does not result in a meaningful change such as increasing their quality of life (Weddle & Carreau, 2018). Stereotypical behaviours certainly require some treatment when they involve

potkrepljivača, a stereotipija je jedan od njih. Kao alternativa potpunom ukidanju pristupa potkrepljivaču, uspostavljanje kontrole stereotipnog ponašanja podražajem predstavlja svrsishodan način da se izvođenje stereotipnog ponašanja ograniči na onu okolinu u kojoj je ono prihvatljivo (npr. kod kuće za vrijeme odmora), dok se uvijek bava samokontrola nad ponašanjem u drugim okruženjima (npr. u obrazovnom okruženju).

Iako je funkcija stereotipnih radnji često dominantno samostimulirajuća (Rapp i Vollmer, 2005), prije odabira pogodne intervencije ne smije se preskočiti provedba *funkcionalne analize ponašanja* kako bi se isključila mogućnost socijalno posredovane etiologije ponašanja (npr. traženje pažnje, pristup objektu/aktivnosti ili bijeg od zadatka), odnosno prilagodio tretman. Većina provedenih studija intervencija (oko 60%) nije bila vođena prethodnom funkcionalnom analizom ponašanja (Akers i sur., 2020; DiGennaro Reed i sur., 2012).

Jedan je od ključnih preduvjeta prakse temeljene na dokazima provjera *integriteta primijenjenog tretmana*, tj. mjere u kojoj je tretman odrađen kako je planirano. To je nužno kako bi se ishodi tretmana (neovisno o uspješnosti) mogli pripisati samom tretmanu, a ne nekim drugim moderirajućim varijablama kao što su obilježja situacije, klijenata i terapeuta (Perepletchikova, 2011). DiGennaro Reed i suradnici (2012) ističu kako većina pregledanih studija učinkovitosti tretmana stereotipija ne sadrži podatke o integritetu tretmana.

Zbog navedenih nedostataka, koji se teško mogu kontrolirati u okviru pojedinačnih studija slučaja, neki autori (Lanovaz i sur., 2013; Zarafshan i sur., 2017) smatraju da, iako studije slučaja predstavljaju važan izvor informacija u razvojnim stadijima nastanka neke nove intervencije, za sigurniju procjenu toga je li određena intervencija utemeljena na dokazima potrebna je provedba tzv. randomiziranih kontroliranih pokusa (eksperimentalna sa slučajnim pridjeljivanjem u eksperimentalnu i kontrolnu skupinu) na velikim uzorcima sudionika. Iako su takve studije izrazito skupe i složene, doseg zaključaka koje ostvaruju znatno nadmašuju doseg zaključaka zbroja velikog broja studija slučaja s istim konačnim brojem sudionika.

the risk of injury, destruction of property and aggression, or when they significantly interfere with learning and functioning. However, Akers et al. (2020) conclude that it is not advisable to reduce them completely for several reasons: 1) they most often do not pose a risk of injury or destruction of property, 2) they are present in some other forms in neurotypical individuals, and 3) complete suppression of stereotypies is not only unjustified but also unethical, because people with ASD have a very narrow range of potential reinforcers, and engagement in stereotypies is one of them. As an alternative to a complete removal of access to the reinforcer, establishing stimulus control over a stereotypy may offer a meaningful way to limit the performance of stereotypical behaviour to the environment in which it is acceptable (e.g., at home during free time), while exercising self-regulation over behaviour in other environments (e.g., educational environment).

Although the function of stereotypical actions is often predominantly self-stimulating (Rapp & Vollmer, 2005), a *functional behavioural analysis* should not be overlooked when selecting an appropriate intervention to eliminate the possibility of a socially mediated aetiology of behaviour (e.g., seeking attention, access to object/activity, or escape from task) and eventually adjust the treatment. Most of the conducted intervention studies conducted so far (around 60%) were not guided by a previous functional behaviour analysis (Akers et al., 2020; DiGennaro Reed et al., 2012).

One of the key prerequisites for evidence-based practice is to inspect the *integrity of the treatment* applied, i.e. the extent to which the treatment has been delivered as planned. This is necessary so that treatment outcomes (regardless of its success) can be attributed to the treatment itself and not to some other moderating variables such as characteristics of the situation, client, and therapist (Perepletchikova, 2011). DiGennaro Reed et al. (2012) pointed out that most of the efficacy studies reviewed so far did not contain data on treatment integrity.

Due to these shortcomings, which are difficult to control within individual case studies, some

Nadalje, ono što se u ovdje prikazanim studijama učinkovitosti tretmana gotovo niti ne spominje, a predstavlja važan element svakog uspješnog tretmana, jest izgradnja *odnosa* između terapeuta i klijenta. Primjerice, unutar primijenjene analize ponašanja (engl. *Applied Behaviour analysis* – ABA) prije uvođenja samih metoda za redukciju određenog ponašanja ili učenja novih oblika adaptivnih vještina provodi se tzv. proces uparivanja (engl. *pairing*) terapeuta s pozitivnim ishodima – zabava, ugodna interakcija, zanimljive igračke, ukusna hrana i slično (Weddle i Carreau, 2018). Tek nakon što je odnos uspostavljen i terapeut povezan s pozitivnim ishodima, terapeut može postavljati određene zahtjeve prema klijentu. Pritom određena obilježja terapeuta (ili njihov nedostatak) mogu biti moderator (ne)efikasnosti provedenog tretmana (Callahan i sur., 2019; Eikeseth, 2010). U novije vrijeme suradnički odnos između terapeuta i djeteta s PSA-om može se valjano izmjeriti (Riosa et al, 2019) i preporučuje se da buduće studije učinkovitosti intervencija uključe i tu mjeru.

Iako se ovaj rad bavi bihevioralnim intervencijama za redukciju stereotipnog ponašanja, važno je naglasiti da se u praksi tretman rijetko ograničava na uklanjanje stereotipija. Štoviše, većina praktičara njeguje *holistički pristup* u kojem se postavljaju višestruki ciljevi, a većina aktivnosti rada s klijentom usmjerena je na poticanje pozitivnih razvojnih promjena (npr. razvoj komunikacije, vještina brige o sebi, socijalnih vještina i sl.). Pritom se daje prednost preventivnim tretmanima usmjerenim na poticanje poželjnog ponašanja, a reaktivni tretmani usmjereni na redukciju problema u ponašanju provode se u slučaju pojave ponašanja koja su ugrožavajuća za samog pojedinca i/ili okolinu (npr. Barbera, 2021). Pokazana učinkovitost antecedentnih tretmana te tretmana utemeljenih na diferencijalnom potkrepljenju poželjnog ponašanja (Akers i sur., 2020) upravo ide u prilog ovakvom pristupu. U svom preglednom radu Carrol i Kodak (2018) opisuju sveobuhvatne programe koji su utemeljeni na dokazima, a neki od njih predstavljaju kombinaciju bihevioralnih tehnika, razvojnog pristupa i pristupa temeljenih na stvaranju odnosa te na igri (npr. *Early Start*

authors (Lanovaz et al., 2013; Zarafshan et al., 2017) believe that, although case studies are an important source of information in the developmental stages of a new intervention, RCT studies (experiments with random assignment in the experimental and control group) involving large samples of participants are required to more reliably assess whether a particular intervention is based on evidence. Although such studies are quite expensive and complex, the reach of the conclusions they achieve far exceeds the reach of the conclusions made by summing up the results of a large number of case studies with the same total number of participants.

Furthermore, what is rarely mentioned in these treatment efficacy studies, but is an important element of any successful treatment, is the building of a *rapport* between the therapist and the client. For example, within the Applied Behaviour Analysis (ABA) therapy, the process of pairing therapists with positive outcomes (fun, pleasant interaction, interesting toys, delicious food, etc.) precedes the introduction of methods used for the reduction of certain behaviours or learning new forms of adaptive skills (Weddle & Carreau, 2018). Only after the relationship has been established and the therapist is associated with positive outcomes, can the therapist make certain demands on the client. In doing so, certain characteristics of the therapist (or lack thereof) may play a moderating role in the (in)effectiveness of a treatment method (Callahan et al., 2019; Eikeseth, 2010). Recently, the collaborative relationship between a therapist and a child with ASD has been successfully measured (Riosa et al., 2019), and it is recommended that future studies on intervention effectiveness include this measure.

Although this paper deals with behavioural interventions aimed at reducing stereotypical behaviour, it is important to emphasise that, in practice, treatment is rarely limited to removing stereotypes. Moreover, most practitioners cultivate a *holistic approach* in which multiple goals are set and most activities with clients are aimed at encouraging positive developmental changes (e.g., development of communication, self-care, social skills, etc.). Preference is given to preven-

*Denver Model, Pivotal Response Training, TEACCH*). U ciljne varijable narednih empirijskih provjera ovih tretmana trebalo bi uključiti i mjere stereotipnog ponašanja.

Konačno, unatoč postojanju tretmana koji imaju određeno utemeljenje na znanstvenim dokazima, neki podaci (prema Carroll i Kodak, 2018) pokazuju da se u praksi najčešće primjenjuju tretmani koji nemaju znanstvenu potporu (oko 90%). To nije samo neučinkovito već može usporiti napredak, naštetiti djetetu i obitelji, neopravdano trošiti obiteljske i državne resurse te je etički problematično. Učinkovit sustav podrške obiteljima djece s PSA-om trebao bi osigurati rano otkrivanje simptoma kao i pristup intervencijama utemeljenim na dokazima na vrijeme i odgovarajućim intenzitetom.

tive treatments aimed at encouraging desirable behaviours, and reactive treatments aimed at reducing behavioural problems are carried out in the event of behaviours that are threatening to the individual and/or the environment (e.g., Barbera, 2021). The demonstrated effectiveness of antecedent treatments and treatments based on the DRA (Akers et al., 2020) supports this approach. In their review article, Carroll and Kodak (2018) described comprehensive (holistic) evidence-based programs, some of which are a combination of behavioural techniques, developmental approaches, as well as relationship-based and game-based approaches (e.g., Early Start Denver Model, Pivotal Response Training, TEACCH). Measures of stereotypical behaviour should be included as the target variables in further empirical verifications of these treatments.

Finally, despite the existence of treatments that have a substantial degree of support in terms of scientific evidence, some data (according to Carroll & Kodak, 2018) showed that treatments that have no scientific support are more commonly used in practice (about 90%). This is not only ineffective, but can slow the progress, harm the child and family, waste family and government resources unjustifiably, and is ethically problematic. An effective support system for families of children with ASD should ensure early detection of symptoms, as well as access to evidence-based interventions delivered on time and with an appropriate intensity.

## REFERENCES

- Ahearn, W. H., Clark, K. M., DeBar, R., & Florentino, C. (2005). On the Role of Preference in Response Competition. *Journal of Applied Behavior Analysis*, 38(2), 247–250. <https://doi.org/10.1901/jaba.2005.36-04>
- Ahearn, W. H., Clark, K. M., MacDonald, R. P. F., & In Chung, B. (2007). Assessing and Treating Vocal Stereotypy in children with Autism. *Journal of Applied Behavior Analysis*, 40(2), 263–275. <https://doi.org/10.1901/jaba.2007.30-06>
- Akers, J., Davis, T., Gerow, S., Hodges, A., & Weston, R. (2019). Stereotypy and Repetitive Behaviors. In J. L. Matson (Ed.), *Handbook of Intellectual Disabilities: Integrating Theory, Research, and Practice* (pp. 565–581). Springer International Publishing. [https://doi.org/10.1007/978-3-030-20843-1\\_31](https://doi.org/10.1007/978-3-030-20843-1_31)
- Akers, J. S., Davis, T. N., Gerow, S., & Avery, S. (2020). Decreasing motor stereotypy in individuals with autism spectrum disorder: A systematic review. *Research in Autism Spectrum Disorders*, 77, 101611. <https://doi.org/10.1016/j.rasd.2020.101611>
- Athens, E. S., Vollmer, T. R., Sloman, K. N., & St. Peter Pipkin, C. (2008). An Analysis of Vocal Stereotypy and Therapist Fading. *Journal of Applied Behavior Analysis*, 41(2), 291–297. <https://doi.org/10.1901/jaba.2008.41-291>
- Bahrami, F., Movahedi, A., Marandi, S. M., & Abedi, A. (2012). Kata techniques training consistently decreases stereotypy in children with autism spectrum disorder. *Research in Developmental Disabilities*, 33(4), 1183–1193. <https://doi.org/10.1016/j.ridd.2012.01.018>
- Baker, M. J., Koegel, R. L., & Koegel, L. K. (1998). Increasing the social behavior of young children with autism using their obsessive behaviors. *Journal of the Association for Persons with Severe Handicaps*, 23(4), 300–308. <https://doi.org/10.2511/rpsd.23.4.300>
- Barbera, M. L. (2021). *Turn Autism Around: An Action Guide for Parents of Young Children with Early Signs of Autism*. Hay House, Inc.
- Bishop, S. L., Richler, J., Cain, A. C., & Lord, C. (2007). Predictors of Perceived Negative Impact in Mothers of Children With Autism Spectrum Disorder. *American Journal on Mental Retardation*, 112(6), 450–461. [https://doi.org/10.1352/0895-8017\(2007\)112\[450:POPNI\]2.0.CO;2](https://doi.org/10.1352/0895-8017(2007)112[450:POPNI]2.0.CO;2)
- Bodfish, J. W., Symons, F. J., Parker, D. E., & Lewis, M. H. (2000). Varieties of Repetitive Behavior in Autism: Comparisons to Mental Retardation. *Journal of Autism and Developmental Disorders*, 30(3), 237–243. <https://doi.org/10.1023/A:1005596502855>
- Bölte, S., Girdler, S., & Marschik, P. B. (2019). The contribution of environmental exposure to the etiology of autism spectrum disorder. *Cellular and Molecular Life Sciences*, 76(7), 1275–1297. <https://doi.org/10.1007/s00018-018-2988-4>
- Borgen, J. G., Charles Mace, F., Cavanaugh, B. M., Shamlan, K., Lit, K. R., Wilson, J. B., & Trauschke, S. L. (2017). A method to establish stimulus control and compliance with instructions. *Journal of Applied Behavior Analysis*, 50(4), 830–842. <https://doi.org/10.1002/jaba.419>
- Boyd, B. A., McDonough, S. G., & Bodfish, J. W. (2012). Evidence-Based Behavioral Interventions for Repetitive Behaviors in Autism. *Journal of Autism and Developmental Disorders*, 42(6), 1236–1248. <https://doi.org/10.1007/s10803-011-1284-z>
- Britton, L. N., Carr, J. E., Landaburu, H. J., & Romick, K. S. (2002). The efficacy of non-contingent reinforcement as treatment for automatically reinforced stereotypy. *Behavioral Interventions*, 17(2), 93–103. <https://doi.org/10.1002/bin.110>
- Brodhead, M. T., Rispoli, M. J., Wendt, O., Akers, J. S., Gerencser, K. R., & Kim, S. Y. (2017). Treatment of Core Symptoms of Autism Spectrum Disorder. In J. L. Matson (Ed.), *Handbook of Treatments for Autism Spectrum Disorder* (pp. 127–144). Springer International Publishing. [https://doi.org/10.1007/978-3-319-61738-1\\_9](https://doi.org/10.1007/978-3-319-61738-1_9)

- Callahan, K., Foxx, R. M., Swierczynski, A., Aerts, X., Mehta, S., McComb, M.-E., Nichols, S. M., Segal, G., Donald, A., & Sharma, R. (2019). Behavioral Artistry: Examining the Relationship Between the Interpersonal Skills and Effective Practice Repertoires of Applied Behavior Analysis Practitioners. *Journal of Autism and Developmental Disorders*, 49(9), 3557–3570. <https://doi.org/10.1007/s10803-019-04082-1>
- Callahan, K., Hughes, H. L., Mehta, S., Toussaint, K. A., Nichols, S. M., Ma, P. S., Kutlu, M., & Wang, H.-T. (2017). Social Validity of Evidence-Based Practices and Emerging Interventions in Autism. *Focus on Autism and Other Developmental Disabilities*, 32(3), 188–197. <https://doi.org/10.1177/1088357616632446>
- Carr, E. G. (1994). Emerging themes in the functional analysis of problem behavior. *Journal of Applied Behavior Analysis*, 27(2), 393–399. <https://doi.org/10.1901/jaba.1994.27-393>
- Carroll, R. A., & Kodak, T. (2018). Evidence-Based Models of Treatment. In C. B. McNeil, L. B. Quetsch, & C. M. Anderson (Eds.), *Handbook of Parent-Child Interaction Therapy for Children on the Autism Spectrum* (pp. 41–53). Springer International Publishing. [https://doi.org/10.1007/978-3-030-03213-5\\_3](https://doi.org/10.1007/978-3-030-03213-5_3)
- Chebli, S. S., Martin, V., & Lanovaz, M. (2016). Prevalence of stereotypy in individuals with developmental disabilities: A systematic review. *Review Journal of Autism Developmental Disorders*, 3(2), 107–118. <https://doi.org/10.1007/s40489-016-0069-x>
- Colón, C. L., Ahearn, W. H., Clark, K. M., & Masalsky, J. (2012). The Effects of Verbal Operant Training and Response Interruption and Redirection on Appropriate and Inappropriate Vocalizations. *Journal of Applied Behavior Analysis*, 45(1), 107–120. <https://doi.org/10.1901/jaba.2012.45-107>
- Cunningham, A. B., & Schreibman, L. (2008). Stereotypy in autism: The importance of function. *Research in Autism Spectrum Disorders*, 2(3), 469–479. <https://doi.org/10.1016/j.rasd.2007.09.006>
- DiGennaro Reed, F. D., Hirst, J. M., & Hyman, S. R. (2012). Assessment and treatment of stereotypic behavior in children with autism and other developmental disabilities: A thirty year review. *Research in Autism Spectrum Disorders*, 6(1), 422–430. <https://doi.org/10.1016/j.rasd.2011.07.003>
- DiGennaro Reed, F. D., & Lovett, B. J. (2007). Views on the efficacy and ethics of punishment: Results from a national survey. *International Journal of Behavioral Consultation and Therapy*, 4(1), 61–67.
- Durand, V. M., & Carr, E. G. (1987). Social influences on “self-stimulatory” behavior: Analysis and treatment application. *Journal of Applied Behavior Analysis*, 20(2), 119–132. <https://doi.org/10.1901/jaba.1987.20-119>
- Eikeseth, S. (2010). Examination of Qualifications Required of an EIBI Professional. *European Journal of Behavior Analysis*, 11(2), 239–246. <https://doi.org/10.1080/15021149.2010.11434348>
- Falcomata, T. S., Roane, H. S., Hovanetz, A. N., Kettering, T. L., & Keeney, K. M. (2004). An Evaluation of Response Cost in the Treatment of Inappropriate Vocalizations Maintained by Automatic Reinforcement. *Journal of Applied Behavior Analysis*, 37(1), 83–87. <https://doi.org/10.1901/jaba.2004.37-83>
- Gehrman, C., Wilder, D. A., Forton, A. P., & Albert, K. (2017). Comparing resetting to non-resetting DRO procedures to reduce stereotypy in a child with autism. *Behavioral Interventions*, 32(3), 242–247. <https://doi.org/10.1002/bin.1486>
- Gover, H. C., Fahmie, T. A., & McKeown, C. A. (2019). A review of environmental enrichment as treatment for problem behavior maintained by automatic reinforcement. *Journal of Applied Behavior Analysis*, 52(1), 299–314. <https://doi.org/10.1002/jaba.508>
- Hinek, S., & Tokić Milaković, A. (2019). Growing up with a brother diagnosed with autism spectrum disorder: the siblings’ perspective. *Croatian Review of Rehabilitation Research*, 55(1), 1-12.
- Koegel, R. L., & Covert, A. (1972). The Relationship of Self-Stimulation to Learning in Autistic Children1. *Journal of Applied Behavior Analysis*, 5(4), 381–387. <https://doi.org/10.1901/jaba.1972.5-381>
- Koegel, R. L., Firestone, P. B., Kramme, K. W., & Dunlap, G. (1974). Increasing Spontaneous Play by Suppressing Self-Stimulation in Autistic Children1. *Journal of Applied Behavior Analysis*, 7(4), 521–528. <https://doi.org/10.1901/jaba.1974.7-521>



- Kuhn, D. E., Hardesty, S. L., & Sweeney, N. M. (2009). Assessment and treatment of excessive straightening and destructive behavior in an adolescent diagnosed with autism. *Journal of Applied Behavior Analysis, 42*(2), 355–360. <https://doi.org/10.1901/jaba.2009.42-355>
- Lahey, B. B. (2017). *Psychology: An Introduction*. McGrawHill Higher Education.
- Lam, K. S. L., & Aman, M. G. (2007). The Repetitive Behavior Scale-Revised: Independent validation in individuals with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 37*(5), 855–866. <https://doi.org/10.1007/s10803-006-0213-z>
- Lang, R., Machalicek, W., Rispoli, M., O'Reilly, M., Sigafos, J., Lancioni, G., Peters-Scheffer, N., & Didden, R. (2014). Play skills taught via behavioral intervention generalize, maintain, and persist in the absence of socially mediated reinforcement in children with autism. *Research in Autism Spectrum Disorders, 8*(7), 860–872. <https://doi.org/10.1016/j.rasd.2014.04.007>
- Lang, R., O'Reilly, M., Sigafos, J., Machalicek, W., Rispoli, M., Lancioni, G. E., Aguilar, J., & Fragale, C. (2010). The effects of an abolishing operation intervention component on play skills, challenging behavior, and stereotypy. *Behavior Modification, 34*(4), 267–289. <https://doi.org/10.1177/0145445510370713>
- Langone, S. R., Luiselli, J. K., & Hamill, J. (2013). Effects of response blocking and programmed stimulus control on motor stereotypy: A pilot study. *Child & Family Behavior Therapy, 35*(3), 249–255. <https://doi.org/10.1080/07317107.2013.818906>
- Lanovaz, M. J., Robertson, K. M., Soerono, K., & Watkins, N. (2013). Effects of reducing stereotypy on other behaviors: A systematic review. *Research in Autism Spectrum Disorders, 7*(10), 1234–1243. <https://doi.org/10.1016/j.rasd.2013.07.009>
- Lanovaz, M. J., & Sladeczek, I. E. (2012). Vocal Stereotypy in Individuals With Autism Spectrum Disorders: A Review of Behavioral Interventions. *Behavior Modification, 36*(2), 146–164. <https://doi.org/10.1177/0145445511427192>
- Laprieme, A. P., & Dittrich, G. A. (2014). An Evaluation of a Treatment Package Consisting of Discrimination Training and Differential Reinforcement with Response Cost and a Social Story on Vocal Stereotypy for a Preschooler with Autism in a Preschool Classroom. *Education and Treatment of Children, 37*(3), 407–430. <https://doi.org/10.1353/etc.2014.0028>
- LeClerc, S., & Easley, D. (2015). Pharmacological Therapies for Autism Spectrum Disorder: A Review. *Pharmacy and Therapeutics, 40*(6), 389–397.
- Loftin, R. L., Odom, S. L., & Lantz, J. F. (2008). Social Interaction and Repetitive Motor Behaviors. *Journal of Autism and Developmental Disorders, 38*(6), 1124–1135. <https://doi.org/10.1007/s10803-007-0499-5>
- Lovaas, I., Newsom, C., & Hickman, C. (1987). Self-stimulatory behavior and perceptual reinforcement. *Journal of Applied Behavior Analysis, 20*(1), 45–68. <https://doi.org/10.1901/jaba.1987.20-45>
- Lovaas, O. I., Litrownik, A., & Mann, R. (1971). Response latencies to auditory stimuli in autistic children engaged in self-stimulatory behavior. *Behaviour Research and Therapy, 9*(1), 39–49. [https://doi.org/10.1016/0005-7967\(71\)90035-0](https://doi.org/10.1016/0005-7967(71)90035-0)
- Lydon, S., Moran, L., Healy, O., Mulhern, T., & Young, K. E. (2017). A systematic review and evaluation of inhibitory stimulus control procedures as a treatment for stereotyped behavior among individuals with autism. *Developmental Neurorehabilitation, 20*(8), 491–501. <https://doi.org/10.1080/17518423.2016.1265604>
- MacDonald, R., Green, G., Mansfield, R., Geckeler, A., Gardenier, N., Anderson, J., Holcomb, W., & Sanchez, J. (2007). Stereotypy in young children with autism and typically developing children. *Research in Developmental Disabilities, 28*(3), 266–277. <https://doi.org/10.1016/j.ridd.2006.01.004>
- McNamara, K., & Cividini-Motta, C. (2019). Further evaluation of treatments for vocal stereotypy: Response interruption and redirection and response cost. *Behavioral Interventions, 34*(2), 181–197. <https://doi.org/10.1002/bin.1657>

- Melo, C., Ruano, L., Jorge, J., Pinto Ribeiro, T., Oliveira, G., Azevedo, L., & Temudo, T. (2020). Prevalence and determinants of motor stereotypies in autism spectrum disorder: A systematic review and meta-analysis. *Autism: The International Journal of Research and Practice*, 24(3), 569–590. <https://doi.org/10.1177/1362361319869118>
- Morrison, H., Roscoe, E. M., & Atwell, A. (2011). An evaluation of antecedent exercise on behavior maintained by automatic reinforcement using a three-component multiple schedule. *Journal of Applied Behavior Analysis*, 44(3), 523–541. <https://doi.org/10.1901/jaba.2011.44-523>
- Ninci, J., Neely, L. C., Burke, M. D., Rispoli, M., Vannest, K. J., Willson, V., & Ulloa, P. (2020). A Meta-Analysis of Single-Case Research on Embedding Interests of Individuals With Autism Spectrum Disorder. *Remedial and Special Education*, 41(5), 296–308. <https://doi.org/10.1177/0741932519841692>
- O'Connor, A. S., Prieto, J., Hoffmann, B., DeQuinzio, J. A., & Taylor, B. A. (2011). A stimulus control procedure to decrease motor and vocal stereotypy. *Behavioral Interventions*, 26(3), 231–242. <https://doi.org/10.1002/bin.335>
- Perepletchikova, F. (2011). On the Topic of Treatment Integrity. *Clinical Psychology : A Publication of the Division of Clinical Psychology of the American Psychological Association*, 18(2), 148–153. <https://doi.org/10.1111/j.1468-2850.2011.01246.x>
- Piazza, C. C., Adelinis, J. D., Hanley, G. P., Goh, H.-L., & Delia, M. D. (2000). An Evaluation of the Effects of Matched Stimuli on Behaviors Maintained by Automatic Reinforcement. *Journal of Applied Behavior Analysis*, 33(1), 13–27. <https://doi.org/10.1901/jaba.2000.33-13>
- Rapp, J. T., Swanson, G., Sheridan, S. M., Enloe, K. A., Maltese, D., Sennott, L. A., Shrader, L., Carroll, R. A., Richling, S. M., Long, E. S., & Lanovaz, M. J. (2013). Immediate and subsequent effects of matched and unmatched stimuli on targeted vocal stereotypy and untargeted motor stereotypy. *Behavior Modification*, 37(4), 543–567. <https://doi.org/10.1177/0145445512461650>
- Rapp, J. T., & Vollmer, T. R. (2005). Stereotypy I: A review of behavioral assessment and treatment. *Research in Developmental Disabilities*, 26(6), 527–547. <https://doi.org/10.1016/j.ridd.2004.11.005>
- Riosa, P. B., Khan, M., & Weiss, J. A. (2019). Measuring therapeutic alliance in children with autism during cognitive behavior therapy. *Clinical Psychology & Psychotherapy*, 26(6), 761–767. <https://doi.org/10.1002/cpp.2404>
- Rispoli, M., Camargo, S., Machalicek, W., Lang, R., & Sigafos, J. (2014). Functional communication training in the treatment of problem behavior maintained by access to rituals. *Journal of Applied Behavior Analysis*, 47(3), 580–593. <https://doi.org/10.1002/jaba.130>
- Rush, K. S., Mortenson, B. P., & Birch, S. E. (2010). Evaluation of preference assessment procedures for use with infants and toddlers. *International Journal of Behavioral Consultation and Therapy*, 6(1), 2–16.
- Rutter, M. (2005). Incidence of autism spectrum disorders: Changes over time and their meaning. *Acta Paediatrica*, 94(1), 2–15. <https://doi.org/10.1111/j.1651-2227.2005.tb01779.x>
- Singer, J. (2017). *Neurodiversity: The Birth of an Idea*. [Kindle edition].
- Smith, E. A., & Van Houten, R. (1996). A comparison of the characteristics of self-stimulatory behaviors in “normal” children and children with developmental delays. *Research in Developmental Disabilities*, 17(4), 253–268. [https://doi.org/10.1016/0891-4222\(96\)00007-8](https://doi.org/10.1016/0891-4222(96)00007-8)
- Spencer, V. G., & Alkhanji, R. (2018). Response interruption and redirection (RIRD) as a behavioral intervention for vocal stereotypy: A systematic review. *Education and Training in Autism and Developmental Disabilities*, 53(1), 33–43.
- Thelen, E. (1981). Kicking, rocking, and waving: Contextual analysis of rhythmical stereotypies in normal human infants. *Animal Behaviour*, 29(1), 3–11. [https://doi.org/10.1016/s0003-3472\(81\)80146-7](https://doi.org/10.1016/s0003-3472(81)80146-7)
- Van Camp, C. M., Lerman, D. C., Kelley, M. E., Roane, H. S., Contrucci, S. A., & Vorndran, C. M. (2000). Further analysis of idiosyncratic antecedent influences during the assessment and treatment of problem behavior. *Journal of Applied Behavior Analysis*, 33(2), 207–221. <https://doi.org/10.1901/jaba.2000.33-207>

- Vollmer, T. R., Marcus, B. A., & LeBlanc, L. (1994). Treatment of Self-Injury and Hand Mouthing Following Inconclusive Functional Analyses. *Journal of Applied Behavior Analysis*, 27(2), 331–344. <https://doi.org/10.1901/jaba.1994.27-331>
- Wang, D., Mason, R. A., Lory, C., Kim, S. Y., David, M., & Guo, X. (2020). Vocal Stereotypy and Autism Spectrum Disorder: A Systematic Review of Interventions. *Research in Autism Spectrum Disorders*, 78. <https://doi.org/10.1016/j.rasd.2020.101647>
- Weddle, S. A., & Carreau, A. B. (2018). Function-Based Interventions for Problem Behavior: Treatment Decisions and Feasibility Considerations. In C. B. McNeil, L. B. Quetsch, & C. M. Anderson (Eds.), *Handbook of Parent-Child Interaction Therapy for Children on the Autism Spectrum* (pp. 189–216). Springer International Publishing. [https://doi.org/10.1007/978-3-030-03213-5\\_11](https://doi.org/10.1007/978-3-030-03213-5_11)
- Wu, Y.-P., Mirenda, P., Wang, H.-P., & Chen, M.-C. (2010). Assessment and Treatment of Stereotypic Vocalizations in a Taiwanese Adolescent with Autism: A Case Study. *International Journal of Special Education*, 25(3), 160–167.
- Zarafshan, H., Salmanian, M., Aghamohammadi, S., Mohammadi, M. R., & Mostafavi, S. A. (2017). Effectiveness of Non-Pharmacological Interventions on Stereotyped and Repetitive Behaviors of Pre-school Children With Autism: A Systematic Review. *Basic and Clinical Neuroscience*, 8(2), 95–103. <https://doi.org/10.18869/nirp.bcn.8.2.95>