Extended Essay

Psychology

Title:

Treatment for Autistic Spectrum Disorders

Research Question:

To what extent is Applied Behavior Analysis (ABA) a more effective treatment approach for improving communication in preschoolers with Autistic Spectrum Disorders compared to DIR/Floortime?

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Introduction

Autism Spectrum Disorder (ASD) is a complex developmental disorder that can cause problems with thinking, feeling, language, communication and the ability to relate to others. It is a neurological disorder, affecting the functioning of the brain (APA, 2016). While the severity of symptoms may vary, it greatly affects the individual and their family constituting it a severe mental health disorder.

It is 4.5 times more common in boys than in girls and currently, prevalence rates for ASD show that 1 in 68 children are diagnosed with the disorder, irrespective of racial, ethnic or socioeconomic groups (Centre for Disease Control and Prevention, 2016). Due to rising prevalence rates and evidence suggesting that early intervention is vital, research focuses on the effectiveness of treatment. Psychologists have examined and suggested many treatment approaches, targeting different disabilities caused by autism. Some treatment approaches are more studied and evidence based than others, which means that they tend to be used more frequently, for example Applied Behavior Analysis (ABA) and DIR/Floortime.

In order to examine effectiveness of treatment, one needs to first define and understand the nature of ASD. There are four main sub-types of autism; Asperger's syndrome, Pervasive Developmental Disorder (PDD-NOS), autistic disorder and Childhood Disintegrative Disorder (CDD). Altogether they are referred to as Autistic Spectrum Disorder and although symptoms may vary in intensity and severity, there are some core characteristics present across the spectrum (APA, 2016). The core deficiencies are divided into three main categories; social interactions and relationships, language and communication impairment and limited interests in

activities or play. Social interactions and relationships include lack of interest in sharing with others any enjoyment or achievements, failure to establish friendships and have interactions and lack of empathy, showing a difficulty in emotional awareness and understanding another one's facial expressions or feelings. Language impairment refers to delay or never learning to speak (verbal communication), limited speech with problems in initiating a conversation or maintaining it, repetitive use of language or sounds and difficulty in perceiving the listener's perspective (nonverbal communication). Lastly, limited interests in activities or play include tendency to engage in repetitive behaviors or body movements (i.e. hand flapping), following strict routines, an unusual focus on specific pieces and parts of a toy and preoccupation with certain topics (APA, 2016; Autism Speaks, 2017). Irrespective of the severity of these symptoms, difficulties in all three areas demonstrate an underlying deficiency in communication affecting all aspects of their lives.

Two popular approaches to treatment are ABA and Floortime, which seemingly have a different theoretical background, but both aim to improve the core deficiency regarding communication, following different methods and procedures. ABA is a scientific approach improving behaviors of social significance, such as communication by breaking down complex tasks into small manageable steps using principles of behavioral psychology (Johnson, 2013).Lovaas (1987)found that 47% of preschoolers with ABA intervention had a higher overall functioning than 2% of the control group with no treatment.Replications of the effectiveness of ABA and Lovaas' study has shown that children become even able to attend classes alongside nondisabled peers.However, despite the success of ABA demonstrated through empirical support, there have been some criticisms. Most have to do with some of

the techniques used creating a non-natural environment for learning, as ABA is a strict and measurable process and is mostly adult led. Thus, alternative treatment approaches are proposed with different theoretical background and techniques. Floortime is a scientific approach which focuses on social, emotional, relational and cognitive development through play using methods such as shared attention and problem solving (Autism Speaks, 2014) and it is based on parent-child interactions.

Evidence suggests that both are effective in improving communication in ASD preschoolers, however, being very different in implementation, the way their effectiveness is measured differs and the extent to which one is more effective than the other should be examined. Both quantitative and qualitative studies are used, such as meta-analyses of different experimental methods, randomized control trials, and case studies, each being critically evaluated in order to establish the degree to which they are effective. The thesis proposed is that both can be effective in promoting specific aspects of communication, however ABA is mostly based on the involvement of therapists, whereas Floortime relies on the role of the parent-child interaction. This differentiates them in terms of practicality.

Thus, this paper will examine, *to what extent is Applied Behavior Analysis (ABA) a more effective treatment approach for improving communication in preschoolers with Autistic Spectrum Disorders compared to DIR/Floortime?*

Treatment

Applied Behavior Analysis (ABA)

Applied Behavior Analysis (ABA), is a well-researched behavioral intervention programme, considered one of the most popular research-based educational practices and effective ways to treat autism (Matson et al., 2012). ABA focuses on improving social communication skills using principles of behavioral psychology such as positive reinforcement and extinction. The targeted behaviors need to be observable and measurable and aim at being generalized so as to improve functioning and quality of life of people with ASD. The behaviors are broken down into small steps and using methods like modelling, prompting (verbal and physical) and reinforcement, skills are improved one by one and gradually mastered and acquired (Harris & Delmolino, 2002). ABA treatment usually begins and is most effective when it starts from a young age with intense one-on-one interventions in different settings. In this way, behaviors learned will be generalized across different environments, like school and home, and the outcome will be long-term (Ryan et al., 2014). Many studies have shown that clinicians are able to improve verbal and non-verbal communication by teaching children to answer questions, follow directions, discriminate between sounds and establish sound-object relationships (Matson, 2011). Moreover, Discrete Trial Training (DTT) is a technique used, which focuses on teaching a specific task by repetitive presentation to the student (Lovaas, 1987).

Multiple studies have shown the efficacy of ABA as a treatment for ASD. To begin with, Eikeseth et al. (2002) conducted a study, investigating the effect of intensive behavioral treatment on children with ASD between ages 4 and 7. Thirteen children

received ABA treatment while twelve children received an eclectic special education treatment comprising of different techniques, such as TEACCH and sensory-motor therapies. The duration of treatment was one year and took place in public kindergartens with each participant having up to 2 therapists. Treatment for both groups was on a one-to-one basis and the rest of the time they were integrated with their classmates and were only shadowed. Treatment goals were recorded by the therapists based on manuals developed by Lovaas and different scales like the Wechsler Intelligence Scale for Children-Revised, Vineland Adaptive Behavior Scales and Teacher Forms, were used to assess intellectual functioning, adaptive behavior and problems in social behavior, respectively. The therapists assessing the children were independent and unaware of the children treatment group. The results showed that there were significant gains on the ABA treatment group compared to the eclectic group during this 1year intervention. Significant ABA treatment gains were noticed in IQ scores, language comprehension, expressive language and adaptive behavior compared to the eclectic approach indicating that ABA significantly improved overall communication and behavior of the ASD preschoolers. Using double blind procedures, researcher bias were minimized increasing credibility of results. However, this study has certain limitations. Firstly, a small and gender biased sample was used so generalization is limited and participants were not randomly allocated to their groups and this may have confounded the results. Further, although there is high ecological validity, as the study was conducted in public kindergartens, which is the natural environment for preschoolers, the setting made it more difficult to control extraneous variables that could potentially confound the results. For example, improved adapted behavior may not have been the result of

the treatment but of the child spending a year in school. Lastly, effectiveness was measured a year later but in order to assess maintenance of skills further follow up is required. However, the same researchers conducted a follow up study (Eikeseth et al. 2007) when the children were 8 years old and had continued to receive their respective treatments throughout the years. They found that ABA-treated children scored even higher on the rating scales and gained more points, with less severe social problems and improved adaptive behaviors, compared to the eclectic group. Despite this study not being able to ensure standardized procedures and to control for quality of treatment throughout the years it still managed to indicate that early ABA intervention improves both communication and behavior long term.

Furthermore, a meta-analytic study investigating the effectiveness of ABA intervention for children with ASD was conducted by Scheffer et al. (2011). Eleven Early Intensive Behavioral Intervention(EIBI) studies using ABA were reviewed that had a control group using other types of treatments, such as the eclectic approaches identified in the previous study. Participants were all diagnosed with ASD and were under 10 years old of both genders, having participated in treatment from 10 months to 2 years. Results showed that EIBI groups had more effective results in all measures compared to control groups. Specifically, the EIBI groups scored significantly higher in IQ measures, receptive and expressive language, adaptive behaviors, communication, daily living and socialization. However, certain methodological issues with the use of meta-analyses limits the results, as studies compared may differ in quality and intensity of treatment and participants may vary significantly on severity of symptoms. Further, different types of control treatments

were used so direct comparisons cannot be inferred. Further, each study varied in sample size with the majority being small, and in most studies random allocation to the different treatment groups did not take place. Finally, the researchers themselves interpret the findings cautiously as they realize that a meta–analysis is based on published studies and thus is threatened by publication bias, with more positive outcome studies being published. Despite limitations overall this study did manage to establish superiority of ABA over a variety of other treatments in improving communication and behavior.

Due to the methodological issues of meta-analyses discussed above a more refined meta-analysis with strict criteria and rigorous analysis looking into the long-term effectiveness of ABA intervention for preschoolers with autism was conducted by Virues-Ortega (2010). This study involved careful selection and assessment of studies. Study selection included studies investigating the effects of intensive, long-term ABA intervention using children with autism and pervasive developmental disabilities. He used studies published between 1985 and 2009, with no language restrictions and used a number of exclusion criteria such as intensity/duration standards not met, intervention group less than 5 participants, anecdotal or non-standardized outcome, purposely biased subject selection. Selection of studies included some of the following data; age and IQ before intervention, intensity and duration of intervention, clinic-based or parent-managed programs. The meta-analysis was further rigorously controlled by contacting the authors of the original studies to see if any data were not available in the published reports, using an assistant translator for translating studies published in other languages and also, two

investigators assessed the quality of the studies independently. Finally, 22 studies were included in the meta-analysis. Then careful and systematic statistical analysis was employed taking into account the different types of experimental designs used, and the different effects of duration and intensity.

A total of 323 subjects were included with a mean age ranging from 22 to 66 months. The results showed significant positive effects of ABA intervention in verbal and non-verbal IQ, receptive and expressive language, communication, daily living skills and socialization. Specifically, for communication, receptive language was assessed in 11 different studies providing ABA intervention, all of which showed positive outcomes of ABA on receptive language performance. Expressive language was assessed in 10 studies and all studies reported a significant positive effect of ABA using standardized assessments. Communication, daily living skills and socialization were assessed in 11 studies, which showed favorable effects on these three domains. Overall, findings suggest that ABA was an effective treatment approach for improving communication in children with ASD.

This study used state of the art meta-analytical methods to investigate effectiveness of ABA treatments, thus providing more valid results. It used many studies, specific to the aim of the investigation, resulting to valid data and conclusions. By using many statistical methods, it established a positive relationship between ABA intervention and effects in autism in language-related outcomes. Communication showed stronger positive effects, which is important as it is a core deficiency of autism.

However, still most studies used, had small samples and clearer descriptions and operationalized definitions of what each intervention method involved is needed to

ensure therapists follow the same protocols to allow for comparisons. Nevertheless, this study also managed to compare ABA with other control groups receiving eclectic treatments such as special education, sensory integration, TEACCH and others and suggests a superiority of ABA intervention compared to the rest. Nevertheless, we have to keep in mind that this was not a systematic comparison and consequently we need to be cautious on such a conclusion. Further research should compare them more directly (Virues-Ortega, 2010).

To conclude, ABA-based procedures are robust, as they seem to be highly effective in teaching a range of communicational skills to children with ASD. Due to the fact that ABA is backed up with years of research, it seems to be consistently effective in enhancing communication in children with ASD. Furthermore, the fact that it is based on a therapist or teacher gives the advantage of control over the intervention.

However, despite the success of ABA demonstrated through empirical support, it is considered an artificial and inflexible approach limiting spontaneous communication and generalization of skills (Matson et al., 1996). Thus, a different treatment approach is examined with different theoretical background and techniques.

DIR/FLOORTIME Approach

Greenspan and Wieder (2001) created Floortime therapy from the Developmental Individual-difference Relationship-based model (DIR) which provides an alternative to this type of controlled learning by focusing on social, emotional, relational and cognitive development through play. It is an alternative to ABA, which is less directive. The main assumption is that social and interpersonal relations are the core deficit underlying communication issues and the main difference is that it is child led,

often involving the parent or therapist being on the floor and focusing on whatever the child does or plays with. Only then does a communication channel open allowing for more complex aspects of communication to take place (Wieder & Greenspan, 2003).

Therapists typically train parents to engage in turn taking play in order to slowly achieve the following: self-regulation and interest in the world, intimacy, or engagement in human relations, two-way communication, complex communication, emotional ideas, emotional thinking. This way of treatment aims to amplify emotional and back-fourth interactions through shared attention, engagement and problem solving (Autism Speaks, 2014).

In 2009, the National Autism Center published an overview of evidence based treatments for autism. ABA was rated as "established", meaning that sufficient evidence exists to determine its efficacy while DIR/Floortime was rated as "emerging", meaning that just a few studies support it and that more high-quality studies should be conducted (NAC, 2009). One of the reasons this may be is because Floortime as an approach is not as measurable as ABA which focuses on observable behaviors carefully measured and recorded that could account for its high efficacy. In Floortime, the focus is on the interaction and the way it is conducted does not allow for systematic data recording. Nonetheless, the use of video assessment could be used to test for efficacy. Multiple Floortime studies have been able to show communication improvement in children with autism.

One such study was conducted by Dionne and Martini (2011) aiming to investigate the effectiveness of Floortime intervention using a case study of a 3-year-old child

with ASD. The boy had no previous involvement with ABA or Floortime techniques and it was only able to communicate non-verbally by using the Picture Exchange Communication System (PECS). The researchers took baseline observations in order to compare with post intervention observations. They used a variety of rating scales such as the Childhood Autism Rating Scale (CARS), Sensory Profile, Functional Emotional Assessment Scale in order to assess behavior, the ability to process sensory information and emotional capacities, respectively. Firstly 8 sessions were observed to gather baseline data without the application of Floortime and then the intervention phase lasting for 28 sessions where the mother was instructed to use Floortime techniques. The mother was required to be involved in most of the processes and practice strategies in order to avoid disengagement or sensory overload of the child. She was also told to report any improvements or changes that she observes. The change of behavior was measured by the Circles of Communication (CoC), which refers to two participants responding to each other verbally or non-verbally and ensuring the continuity of communication (Greenspan et al., 2001). Results showed that the mother-child communication, even if non-verbal, had improved and it had developed to be more spontaneous with rapid exchange of CoC. The CoC numbers were significantly lower in the observation phase, compared to the intervention phase. Through Sensory Profile, the child showed to develop emotional interest towards his mother and better multisensory processing. However, many times the mother used verbal communication, which resulted to the disengagement of the child, causing problems in the two-way communication. Functional Emotional Assessment Scale (FEAS) scores indicated higher scores in sensory play compared to symbolic play. This case study

demonstrated significant improvement in spontaneous communication using early Floortime intervention. Being a case study, rich and in-depth information was obtained but generalization is very limited. It can only serve as preliminary evidence that should be supported by more studies conducted on larger samples of children with ASD. Also, it should be conducted on different severity levels as this type of approach may be more beneficial for milder cases. Finally, this study was not long term in order to assess consolidation of skills and further development.

Further support for the DIR/Floortime approach was provided by Solomon et al.'s (2007) study. Parents were trained through structured sessions to acquire skills needed in the treatment phase. These sessions included teaching of principles of Floortime, assessment of their child's profile, observations of their child's cues, video assessment and refining the techniques. Sixty-eight children, of both genders, with an average age of 3.7 years old, diagnosed with ASD participated in the intervention lasting 8-12 months. Parents delivered the treatment 15 hours per week and they were videotaped before and after the intervention by independent raters blinded to the pre- or post-condition using the FEAS. This scale measures important outcomes relating to communication such as forming relationships, attachment and engagement; two-way, purposeful communication; behavioral organization and problem solving. Further, statistical tests were used to test the reliability of the rater's scores, concerning the children's clinical progress. The results showed that in the end of the 1 year, there was a significant increase in all subscales of the FEAS as almost half of the children had good to very good developmental progress. Also, the statistical tests showed high reliability of rater's scores and there was a highly significant increase in the clinical progress of the children before and after this

project. This study effectively taught parents the Floortime model, as 85% of the parents were considered to be appropriately interactive and seems successful in improving communication skills of ASD preschoolers. However, an important limitation applicable to both studies, is that there was no control group to compare and attribute changes to the Floortime approach as compared to a different intervention. Also, more objective measures of specific areas such as language and IQ could have been employed pre- and post-therapy. Further, parents were videotaped and may have exhibited the social desirability effect in estimating the number of interactions during the day which they kept in a log. Lastly, generalization is an issue as improvements in communication were shown usually towards one caretaker and future studies should assess generalization across settings and people. Despite limitations, it shows how a cost-effective model can be employed by parents through play and achieve significant improvement in communication.

However, the following study, despite being small, did include a control group and demonstrated positive effects for ASD children supporting previous studies mentioned. Pajareya et al. (2011) conducted a pilot randomized controlled trial of DIR/Floortime for pre-school children with ASD in Thailand. Thirty-two children participated and assigned to either typical treatment or DIR/Floortime while controlling for severity using a stratified random sampling procedure based on both age and severity. Parents were trained via attending training workshops and DVD lectures. The CARS and FEAS were used to measure improvements in autistic symptoms and on different communication subscales by comparing pre-and post-intervention scores. Results showed that after 3 months of approximately 15 hours a

week of Floortime intervention delivered by the parents, the intervention groups showed significant improvements in all measures, confirming previous studies. Therefore, this study showed that Floortime helped the children engage and communicate with their caregivers more effectively compared to other typical behavioral interventions. Methodologically, the study was successful in controlling for severity and including a control group. However, this study presents with a number of limitations as it is only meant to be used as a pilot. Firstly, a small and culture biased sample was used limiting generalization which was also recruited through advertising. Also, previous treatments of the participants were not controlled for and like previous studies, more specific outcome measures could be used e.g. language, IQ, social and cognitive skills.

Overall, the DIR/Floortime approach offers a more naturalistic intervention delivered through play by the primary caregivers minimizing costs, and focuses on emotional development and communication of the child. However, its effectiveness is largely based on the degree of involvement of the parents and difficulties they may face in play or affect would lead to unsuccessful outcomes. Thus, some parents might refrain from such an approach from fear of failing to respond to the demands of the intervention (Wieder & Greenspan, 2001). This is an important difference with ABA, which although expects parental involvement, it relies more on the work of therapists and teachers. Evidence provided is preliminary (NAC, 2009) and it is characterized by several methodological weaknesses that should be addressed in further research.

Conclusion

After taking into account all the evidence on the efficacy of both ABA and DIR/Floortime approach, it becomes evident that ABA is well researched and more evidenced based as a treatment approach for improving communication in ASD preschoolers. ABA is a behavioral approach, breaking down complex behaviors such as communication into smaller steps, making it more measurable and easier to test for effectiveness through objective measures while DIR/Floortime focuses on emotional, social and pragmatic aspects of communication delivered through parents making it harder to assess effectiveness. Though efficacy studies on both approaches suffer from a variety of methodological weaknesses, it seems that evidence on the effectiveness of the ABA is more robust. However, research in the field lacks randomized control trials, which compare the two treatment approaches, taking into account severity levels, previous treatment, long-term effects and using the same assessment measures and standardized procedures to allow for meaningful comparisons. Autism lies on a spectrum with core symptoms being similar across the spectrum but with differences in intensity and severity. Consequently, some treatment approaches may be more effective for a specific type or severity level and this needs to be addressed in future research.

Each approach presents with strengths and limitations concerning their ecological validity promoting spontaneous communication and generalizability, therefore these two approaches may be combined adopting an interactionist approach to the treatment of ASD. It is evident that children with autism can benefit from more structured approaches like ABA to be taught specific skills, however, it is important

to recognize that Floortime is more natural and it involves the parents, making it more cost effective. Thus, it is important to conduct more controlled studies comparing the two but also to acknowledge that these approaches do not necessarily contradict each other but could be complementary to one another.

To conclude, ABA being more evidence based, seems to be a more effective treatment approach for improving communication in preschoolers with ASD compared to DIR/Floortime for the time being.

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