

Effect of ABA Therapy on Language and Communication Skills among Children with Autism in
Kyrgyzstan

Anna Semikina

American University in Central Asia

Author Note

Anna Semikina is currently a senior student of the Psychology Department of the American University of Central Asia.

This research was conducted with the guidance from the faculty members of the Psychology Department.

Correspondence concerning this research study should be addressed to Semikina Anna, Psychology Department, American University of Central Asia, 205, Abdymomunov Street, room 209, Bishkek, Kyrgyz Republic, postal code 720040 or email at annasemikina93@gmail.com.

Abstract

This research aimed at identifying the effectiveness of ABA therapy for treating children with autism in Kyrgyzstan. Specifically, the study investigated how ABA therapy affects language and communication skills. These specific areas are especially important because for children with autism spectrum disorders, communication development happens differently and slowly due to the neurological problems and sensory challenges associated with the disorder. The participants were five children diagnosed with autism who attend the center “Hand in Hand” in Bishkek. Interviews and surveys with their parents and direct observation of the treatment sessions with these children were conducted. Assessment of Basic Language and Learning Skills (ABBLs) was also administered in order to see the learning dynamic and measure it on the basis of nine categories such as receptive language, vocal imitation, motor imitation, requests, labeling, intraverbals, cooperation, reinforcer effectiveness, visual performance, and spontaneous vocalizations. This test was done every two months during the data collection process. The results of the study showed that the ABA therapy is an effective tool for teaching language and communication skills to children with autism. Despite slight variations, all children who took part in this research demonstrated significant improvements in all the expected areas of behavior.

Keywords: ABA therapy, language, communication skills, autism, ABBLs.

Effectiveness of ABA Therapy on Language and Communication Skills on Children with
Autism in Kyrgyzstan

What is autism? Who are people with autism? What kind of problems do they have?

There are a lot of questions that come to mind of person who heard about it. Autism is one of the greatest problems in the world. The number of people diagnosed with this disability is dramatically increasing in recent years. Studies in Asia, Europe, and North America have identified individuals with Autism Spectrum Disorder (ASD) with an average prevalence of about 1% . A recent study made by Centers for Disease Control and Prevention in South Korea reported a prevalence of 2.6% (Kim, 2011). According to the National Research Center for Special Education (2010), the number of children diagnosed with autism has increased ten-fold – from 77 in 2003 to 706 in 2011 in Kazakhstan(Aliaskarova, 2012). Also, statistics show that Autism Spectrum Disorders are almost 5 times more common among boys (1 in 54) than among girls (1 in 252) (ADDM Network, 2008). “Autism is a complex developmental disability that typically appears during the first three years of life and is the result of neurological disorder that affects the normal functioning of the brain, impacting development in the areas of social interaction and communication skills.” (ASA, 2006)

Unfortunately, there is no official statistics about this issue in Kyrgyzstan. Kyrgyzstan is developing country where social issues are not addressed properly. The government started to pay attention to the issues of autism just recently. There are only two Republican Centers for Psychiatric Health in Kyrgyzstan. Health Ministry has problems with the diagnosing such disability as autism. Therefore, children with autism usually are treated with medications or sent to the special centers for children. It is tragedy that there are no enough qualified therapists for treating autism. Children are not educated properly according to their needs.

Some time ago new therapy for autism was introduced to the county called as Applied Behavioral Analysis (ABA therapy). The author of the book *Applied Behavioral Analysis* Cooper (2007) defined ABA as the science in which tactics derived from the principles of behavior are applied systematically to improve socially significant behavior and experimentation is used to identify the variables responsible for behavior change. Both children and adults with autism may

show difficulties in verbal and non-verbal communication, social interaction. Some of them experience difficulties in expressing own emotions, communicating needs, understanding and interacting with others. People may think that child is odd because of the repetitive behavior, strange expression of himself. Such therapy is very popular in the Western countries. Many federal government agencies and nationally federal research institutes recognize ABA therapy as one of the most effective tools for treating children with autism. For example, the July/August 2005 issue of the Journal of Research and Developmental Disabilities featured a study demonstrating that intensive ABA therapy is significantly more effective than special education approach that uses a variety of techniques. Also, ABA therapy has been recognized by a number of state and federal agencies such as: Autism Society of America, American Psychological Association, National Institute of Child Health and Human Development, etc. The United States Surgeon General conducted research and concluded the effectiveness of applied behavioral analysis techniques in reducing inappropriate behavior and developing communication skills, language, and appropriate behavior. “This program is for younger children with an autism spectrum disorder. It can be effective in some cases. ABA uses a one-on-one teaching approach that reinforces the practice of various skills. The goal is to get the child close to normal developmental functioning.”(The New York Times, 2012).

Current research was conducted in order to identify the effectiveness of ABA therapy on language and communication skills on children with autism in Kyrgyzstan. Communication begins long before we learn to talk. In the first few months of life, babies show their interest in communicating by listening some voices, looking at people's faces when they talk, and then engaging in back-and-forth babbling games with their parents. For children with autism spectrum disorder, communication development happens differently and more slowly. Because of the sensory challenges associated with the disorder, children with autism might seem more interested in environmental sounds than in the sound of people talking. The main goal of ABA therapy is to teach children with autism how to communicate with others, how to pronounce words and how

to apply their knowledge to the environment. Through the ABA therapy it was expected that there will be positive effect on the language and communication skills among children with Autism.

For the first time autism was described in the early 1940s by two researchers Leo Kanner and Hans Asperger. They were observing some specific behavior, language problems, impaired social skills that children produced, they both identified it as autism. The symptoms of autism are very different. The main symptoms of autism, according to American Psychological Association, are related to repetitive movements (for instance rocking, spinning or hand-flapping, develops specific routines or rituals, becomes disturbed at the slightest change in routines or rituals, moves constantly, may be fascinated by parts of an object, such as the spinning wheels of a toy car), sensory problems (unusually sensitive to light, sound and touch), impaired social skills (fails to respond to his or her name, has poor eye contact, appears not to hear at times, resists cuddling and holding, appears unaware of others feelings, seems to prefer playing alone, confined to his or her “own world”) and language (starts talking later than other children, loses previously acquired ability to say words or sentences, does not make eye contact when making requests, speaks an abnormal tone or rhythm (singsong voice or robot-like speech), can’t start a conversation, may repeat words or phrases.

Every person who was diagnosed with autism is different. This disability may be linked with some neurological and biological abnormalities in the brain. Still, roots of autism are under investigated. Genetic factors appear to be important. For example, identical twins are much more likely than fraternal twins or siblings to both have autism (ASA, 2006). “Similarly, language abnormalities are more common in relatives of autistic children. Chromosomal abnormalities and other nervous system (neurological) problems are also more common in families with autism” (The New York Times, 2012).

Most individuals with autism begin to speak late and develop speech at a significantly slower rate than others. Some children with autism do not talk; they have to learn special techniques (pictures) in order to interact with others. But it is very hard for them to learn it. Those people with autism, who could speak, had to overcome a lot of difficulties and obstacles.. Milestones in language play major roles at almost every point in development in understanding autism” (Tager-Flusberg, 2005). Often parents recognize the absence of early communication in their young children with autism sometime during the second year, when the majority of children the same age begin to have established vocabularies of numerous words (Short, 1988). Tager-Flusberg and Joseph (2003) identified two language phenotypes among verbal children with autism: children with normal linguistic abilities (phonological skills, vocabulary, syntax, and morphology) and children with autism and impaired language that is similar to the phenotype found in specific language impairment. About 25% of children with autism are described by their parents as having some words at 12 or 18 months and then losing them (Kurita, 1985). Researchers Lord, Shulman, and Dilavore in 2004 identified one unique characteristic in children with autism that was not found among children with other developmental disabilities. They found kind of “language regression” that described that at the second year of living children stopped learning new words and fail in engaging in communication as they used to it before. Language loss occurred in these children when they still had relatively small expressive vocabularies and before word explosion (Tager-Flusberg, 2005).

Skinner (1957) proposed that language is learned behavior, and that it is acquired, extended, and maintained by the same types of environmental variables and principles that control non language behavior. He defined verbal behavior as behavior that is reinforced through the mediation of another person’s behavior. Skinner defined verbal behavior by the function of the response, rather than by its form. He differentiated two concepts of behavior in the issue of *speaker* and *listener*. According to Skinner, verbal behavior involves social interactions between speakers and listeners, whereby speakers gain access to reinforcement and control their

environment through the behavior of listeners. It is crucial for the listener to learn how to reinforce the speaker's verbal behavior in order to respond to words and interact with speakers. It is important to teach a child to react appropriately to the verbal stimuli provided by speakers, and to behave verbally as a speaker. (Cooper, 2007)

Also, he identified several elementary verbal operants such as mand, echoic, and intraverbal. The mand is a type of verbal operant in which a speaker asks for (or states, demands, implies, etc.) what he needs or wants. Mands are very important for the early development of language and for the day-to-day verbal interactions of children and adults. The intraverbal is a type of verbal operant in which a speaker differentially responds to the verbal behavior of others. Intraverbal behavior prepares a speaker to respond rapidly and accurately with respect to further stimulation, and plays an important role in continuing a conversation.

One of the most salient aspects of deviant speech in autism is the occurrence of echolalia. Echolalia is the repetition, with similar intonation, of words or phrases that someone else has said. The children with autism at the early stages of language development produced the most echolalic and formulaic speech. For all children, echolalia declined rapidly over the course of development (Tager-Flusberg, 2005). Skinner defined echoic as a type of verbal operant that occurs when a speaker repeats the verbal behavior of another speaker. Echoic behavior produces generalized conditioned reinforcement such as praise and attention. The ability to echo the phonemes and words of others is essential for learning to identify objects and actions. The echoic repertoire is very important for teaching language to children with language delays, and it serves a critical role in the process of teaching more complex verbal skills. (Cooper, 2007)

Early development of communication skills plays a very important role. Babies are interacting with parents, trying to pronounce some sounds, babbling. These exchanges of sounds and smiles between an infant and his caregiver are the baby's first conversations, even though he has never uttered a word. Around the first year of life, infants imitate their parents' actions and single words. Then they start to use their first words on their own and, once they have many

single words, children start to use little two-word sentences. Communication is a two way process for sharing information and ideas between two or more people through the mechanism of language. For most of us, it is also a tool for social bonding. By sharing our thoughts, opinions, experiences and emotions, we get to know and understand other people and ourselves and both form and maintain relationships. For children with autism it is often means of getting needs and wants met. “Communication is about both using (expressive) and understanding (receptive) language. Autism is a social communication disorder and difficulties affect both verbal and non-verbal communication. It is not just about talking or not talking” (Autism West Midlands, 2003)

There are many treatments for autism: Sensory integration, Occupational therapy, Physical therapy, Applied Behavioral Analysis, Speech therapy, Medications, etc. Sensory Integration takes place when autistic individuals have sensory problems, which can range from mild to severe. Sensory integration focuses primarily on three senses — vestibular (balance), tactile (touch) etc. (Smith, 2011). Speech therapy can help a child with autism improve language and social skills to communicate more effectively. Occupational and physical therapy can help improve any deficiencies in coordination and motor skills. Occupational therapy may also help a child with autism to learn to process information from the senses (sight, sound, hearing, touch, and smell) in more manageable ways (Smith, 2011)Applied Behavior Analysis (ABA) is a process of studying and modifying behavior. The field of Behavioral Analysis grew out of a specific study of principles of learning and behavior. ABA is a design, implementation, and evaluation of environmental modifications to produce socially significant improvement in human behavior (Cooper, 2007). Applied Behavior Analysis includes the use of direct observation, measurement, and functional analysis of the relations between environment and behavior. Applied Behavior Analysis uses antecedent stimuli and consequences, based on the findings of descriptive and functional analysis, to produce practical change (Dixon, 2009) The general discipline of ABA and the concepts and methods of functional analysis have been built upon the conceptual foundation of operant conditioning, and as advancements have been made in the

basic and conceptual arenas of behavior analysis, new improvements have been made in the area of application.” (Dixon, 2009).

ABA therapy has become widely accepted among health care professionals and used in many schools and treatment clinics. It is widely recognized as one of the most effective therapy for children with autism spectrum disorder, providing substantial, lasting improvements in the lives of individuals with autism by whom. ABA-based treatment strategies maximize the learning potential of persons with ASD, and are flexible, individualized and dynamic.

ABA therapy includes many different techniques. All of these techniques focus on antecedents (what happens before a behavior occurs) and on consequences (what happens after the behavior). One technique is “positive reinforcement.” When a behavior is followed by something that is valued (a reward), that behavior is more likely to be repeated. ABA uses positive reinforcement in a way that can be measured in order to help bring about meaningful behavior change. Treatment is based heavily on functional assessment, information, and family input. Children work through many different skill areas that include such skill areas as receptive language, expressive communication, visual performance, mathematics, and other academic and self-serving skills. Behavior modification and socialization skills are incorporated into a child's program if and when necessary. “Applied Behavioral Analysis is the science in which tactics derived from the principles of behavior are applied to improve socially significant behavior and experimentation is used to identify the variables responsible for the improvement in behavior” (Cooper, 2007)

ABA therapy was developed in the 1960s by Ivar Lovaas at the University of California. The main strategy of this therapy consisted of the idea that when people are rewarded for the appropriate behavior, it is possible to think that these people are likely to repeat this behavior again. In order to teach people with autism behaving properly, therapist give an instruction (stimulus) and gives a correct behavior model (response). Therefore, person with autism learned

desirable response and reinforced. “The therapist uses attention, praise or a tangible incentive like toys or food to reward the child for repeating the right answer or completing the task; any other response is ignored.” (Winerman, 2004)

In one of the researches Lovaas (1987) found that nearly half the children who received 40 hours per week of ABA therapy were eventually able to complete normal first-grade classes, while none of children who received the therapy only 10 hours per week were able to do the same.

As every therapy has advantages and disadvantages, so ABA therapy also has some pluses and minuses. The main goal of ABA therapy is to replace negative behaviors with positive ones to improve functioning in the family and in the community, reverse negative patterns of thinking, address bad habits, improve performance at school, at home, and in social situations. No other developmental or behavioral treatment has been in use longer than ABA. This approach works well with the need for consistency experienced by many people with autism. More research and support is available for ABA than for any other type of autism therapy. ABA therapists typically follow clear treatment guidelines and are required to keep extensive notes on therapy progress. One of the major drawbacks of behavior therapy is finding a qualified behavioral therapist, particularly for ABA therapy. There are currently no national guidelines qualifying a behavioral therapist, and the demand for ABA far exceeds the professionals qualified to perform it. Another drawback of therapy is time. Although the therapy is considered comparatively short term, it takes time to modify behavior and through reinforcement, replace a negative behavior with a positive one. Not all schools offer ABA instruction, and those that do tend to limit therapy to regular school hours. Poorly trained ABA therapists may inadvertently cause robotic behavior and speech patterns in autistic children undergoing the therapy. “ABA is behavioral, not academic. It focuses on the response of the child but not necessarily the cognitive process that elicits the response .Critics of ABA are

concerned that this type of therapy encourages a child to suppress true emotions and self-expression, which can ultimately be harmful” (Miller-Wilson, 2005)

There were some studies done that believe autism could be recovered. “ABA now is the most recognized and scientifically supported treatment for autism. By changing the antecedents and consequences of behaviors symptomatic of autism, ABA specialists teach children the skills in which they are delayed, thereby replacing challenging and aberrant behaviors with functional and adaptive skills. Research has shown that with early intensive ABA therapy, 47 percent of children with autism fully recover and lead healthy, happy lives.”(Granpeeshen, 2006)

Therefore, this research aims at identifying the effectiveness of ABA therapy in Kyrgyzstan. Specifically, it was investigated how it affects language and communication skills among children with autism. These specific areas are especially important because for children with autism spectrum disorders, communication development happens differently and slowly due to the sensory challenges associated with the disorder. For example, children with autism may seem more interested in environmental sounds than in the sound of people talking. This study concentrated on how the ABA therapy is effective to teach autistic children to interact with others, to pronounce words and to apply their knowledge for better communication.

Method

Participants

One female and four male children diagnosed with autism took part in this study. They ranged from five to nine years old and had poor communication skills and poor language skills. All participants attended the day center for children with autism called “Hand in Hand” and participated in ABA sessions five times per week. Two participants had high-functioning autism (children could talk) and three participants- moderate autism. In addition, their parents also took part in the present research and filled out the questionnaires and provided interviews to share

their opinion about the ABA therapy and the progress children made during the time of the research.

Materials

The ABLLS- R (The Assessment of Basic Language and Learning Skills – Revised) developed by Dr. Partington in 2010, was used. In general, this tool is used as an assessment tool, curriculum guide, and skills-tracking system to guide the instruction of language and critical learner skills for children with autism or other developmental disabilities. The ABLLS-R provides a comprehensive review of 544 skills from 25 skill areas including language, social interaction, self-help, academic and motor skills that most typically developing children acquire prior to entering kindergarten. The task items within each skill area are arranged from simpler to more complex tasks. Expressive language skills are assessed based upon the behavioral analysis of language as presented by Dr. B.F. Skinner in his book, *Verbal Behavior* (1957). For our research I took nine skill areas such as: cooperation and reinforcer effectiveness (how well a child responds to motivation and others), visual performance (the ability to interpret things visually, such as pictures and puzzles), receptive language (the ability to understand language), motor imitation (being able to mimic the physical actions of others), vocal imitation (being able to mimic the sounds and words others make, also called echoic in ABA), requests, labeling (naming objects, or their features, functions, or classes), intraverbals (responding to only the stimulus of words), and spontaneous vocalizations (using language without being prompted). Every skill has a specific score and during the testing it would be possible for me to sum up all the possible scores for one skill domain and then to track the number mastered per domain. The track sheet of ABLLS was an A4 format page with nine columns on it. Every participant had nine scores and graphs for future analysis. ABLLS-R was done once per two months (total 2 times and 1 archival data). During the interviews with the parents and the therapists of the participants were conducted in order to see the progress of the sessions. In order to be objective

and to see the progress we did video recording of the sessions and used participant's observations.

Design

This research combined qualitative and quantitative methods. Current study was based on the small-N experimental design. Participants' observations were used for collecting data on naturally occurring occasions in the sessions and during free time. Also, some questionnaires were used consisting of six questions about general information for each child. ABBLs-R test was also used and graphs to see the progress in each area.

Procedure

From all the attendees of the organization "Hand in Hand", we chose five participants (children with autism) who have poor language and communication skills. Before starting the research, informed consent was obtained from the parents of children and from the organization to conduct the study. Then I started to participate in sessions during which I collected some data (direct observation and videos). The archival data of ABBLs for five participants was used as a baseline. In November ABBLs was applied again with these five participants, summed all the scores for one skill domain and then made the test in February and March in order to track mastered skills in each domain. Each participant had 3 graphs of the progress. The graphs were done in Excel 2010 program. Each graph included 3 columns per each category. So, overall the measurement of the progress in language and communication skills was conducted three times during nine months. Interviews with parents of the participants were also conducted during which detailed information about the progress of each participant and parents' opinions about therapy was collected.

Findings

During the study, it was demonstrated progress on categories such as cooperation and reinforcer effectiveness, visual performance, receptive language, motor imitation, vocal

imitation, requests, labeling, intraverbals, and spontaneous vocalizations. Detailed progress by each category is following.

Cooperation and reinforcer effectiveness

Many children with autism are unwilling to cooperate with request made by others. This category is one of the most important categories in the assessment tool. Skills in this category help child and therapist to build good rapport and understand each other. One of the basic skills is “looks to instructor for instruction”. This skill helps to get child’s attention, to concentrate on the task and the instruction. It was found that all the respondents had a progress in this category. As for the cooperation and reinforcer effectiveness category, the children have made progress as shown in figure 1. This category involves teaching the children to respond to instructor controlled reinforcers, work for a variety of reinforcement and wait appropriately if reinforcer delivery is delayed. The maximum score of this category is 52. According to the figure 1 , during the period of August till May, child 3 improved by 8 points and scored the maximum 52 points, although the child 1 improved by 18 points, scored minimum score equal 37. Child 2 and child 4 scored both 43 points (improved their scores by 5 and 6 points) Child 5 improved his score by 11 points and scored 45 points. Mother of child 5 said: “My child became more focused, changed his reinforcements from food to play or interaction with others children.”

Visual Performance

As for the visual performance category, most of the children have made improvement as shown in figure 2 while few of them have shown minor to moderate improvement. The ability to match pictures, designs and shapes to identical samples often reveals a number of important abilities (Sundberg & Partington, 1998). The maximum score for this category is 96. Child 3 got the highest score 93 and improved by 40 points. Child 1 improved his visual performance skills from 20 to 63 points. Children 2, 5, 4 had improved their skills scored 31, 80, and 73 points. Child 2 improved his score by 21 points; child 5 increased score by 15 points.

Mother of child 1 replied: “He started to do puzzles, sorting and combing objects, started to understand categories of the objects”.

Receptive Language

The objective of the receptive language category is to enable children to understand and act upon specific words or phrases, to follow simple instructions and directions. This category involves teaching the child to follow simple directions, selecting a named item from a simple display of items, later on, teaching the child to follow more complex directions and to identify greater number of items. The maximum score for this category is 178. According to figure 3, there is slight progress among children with this category. At the second phase of the study (March till May) there was demonstrated slight regress of child 4. He decreased his score by 2 points and scored 118 points in total. The highest score had a child 3 improving his score by 81 points and earning 157 points. Child 1 had improved by 49 points and earned 86 points, child 2 had improved by 6 points, and child 5 scored 81 points improving by 40 points on this category.

Mother of child 3 told that her child started understanding the language better. She replied: “ It became easier to interact with my child. Now she understands what I am talking about and what others are telling her. She is less stressed with language”.

Motor Imitation

The objective of motor imitation category is to enable the children to have well developed and generalized imitative selection. It involves teaching the children to imitate motor activities using an object, imitation of body movements including gross, fine, oral and head movements. As for this category four out of five children had a slight progress. Child 3 improved his skills to 58 points out of 80. Child 1 had improved his scores by 11 points and scored 33 points; Child 2 improved his skills by 4 points; Child 5 scored 48 points improving by 8 points.

As it is seen from figure 4 the motor imitation score for child 4 decreased by 5 points at the second phase of the research, and earned only 54 points. According to his mother the reason for

such decline may be related to biomedical treatment: “My child became more aggressive on the classes. He tries to avoid any imitation activities. I think that his behavior decreased because of the medications which he is taking right now”.

Vocal Imitation

The objective of the vocal imitation category is to improve vocal imitation for the children with some speech with the objective of improving articulation or the distinction in volume, tone, or the speed of the child’s speech. For this category child 5 had improved by 25 points and scored 33 points. Child 1 improved by 12 points and his score was equal to 39, child 2 scored 21 points, Child 3 scored the maximum score 56 points out of 56. Child 4 improved by 35 points and scored 51 points. (Figure 5)

According to mother of child 1 her child started to talk: “he is trying to imitate sounds, some words such as car, and toys (in Russian машина”, “игрушки”).

Request

Most children with language delays need to improve their ability to request reinforcers and information (Sundberg, Partington, 1998). Children can request using words, signs or pictures. The objective of this category is to teach the children to ask for several items or activities, to teach them to spontaneously ask for a variety of items and activities, to ask for missing items, for information, and for items from peers and adults. It is possible to see the improvement of the children by this category. According to figure 6, all children improved their scores. Child 5 had big improvements; he scored 34 points. Other 4 children slightly improved their scores. Child 1 had improved by 14 points and scored 38 points, child 2 scored 30 improving only by 5 points, and child 3 improved by 9 points and scored 49 points. As for the child 4, he improved his score earning 9 points and scored 41 points in total. As the mother of child 2 told: “Now it is easier for us to understand each other. Now I know that he understands

me. He can say “yes” or “no”. On the kitchen he may say “apple” meaning that he wants an apple”.

Labeling

Labeling skills are always in need of development even for children who have strengths in this area (The ABLLS Guide, 1998). This category begins with teaching the children to label reinforcers or common items and later it involves teaching the children more complex labeling skills including actions, body parts, adjectives, nouns, verbs, pronouns, prepositions, labeling function, feature and class of an item, labeling using carrier phrase, labeling emotions.

As it is shown in the figure 7, almost all children, despite one, have improvements on this category. Child 1 improved by 17 points and scored 36 points. Child 4 had improved by 23 points and scored 63 out of 154 points. Child 3 improved his skills by 13 points and scored 49 points. As for the child 2 and child 5, they did a very good progress. In August they did not have any points on this category. Child 2 had decreased his points by 2 and scored only 9 points; child 5 improved had improved his score by 8 points and earned 21 points.

Mother of the child 5 replied: “Now, my child knows a lot of words, meanings of the words, its functions. I may ask him about what we studied, and he could label me everything. I am very proud of him”.

Intraverbals

Intraverbals is a type of expressive language where a word or phrase evokes another word or phrase, but the two do not match each other, if the words did match they would be an example of echoic language (Sundberg, Partington, 1998). The objective of teaching intraverbals skills are usually appropriate for vocal children who can request at least few items or activities and have some labeling and receptive language skills. The The intraverbals category involves fill- in missing words or part of songs from songs, provide the sounds of animals, answering novel questions, telling stories, etc... these conversational language skills are important for social interaction, as well as for the acquisition of academic skills. Children are taught to answer

questions and participant in meaningful conversations. As for this category almost all children made some improvement. Child 1 scored 19 points, child 2 improved by 9 points and his score was equal to 10 points. As for the child 3, child 4, and child 5 it is possible to see the progress improving by 12, 6 and 15 points they scored 22, 10, and 16 points (Figure 8)

Mother of child 5 said: “I can talk with my child. It is possible to ask about what he wants. He may say “я устал” meaning that he is tired about the class. Now I may ask him about some information and we would have some dialogue”.

Spontaneous Vocalization

Spontaneous vocalization often increases as a direct result of the naturally occurring reinforcement of using language (Sundberg, Partington, 1998). It involves unprompted sounds, words, singing songs with models, spontaneous requests, and spontaneous labeling. As for the spontaneous vocalization category the children have made some improvements. Child 1 had scored 22 out of 28 (max score); Child 2 scored only 2 points. During the second phase of the research, child 3 and child 4 did not have any progress at this category. Their scores are stable 26 and 28. As for child 5, it is visible the progress. He had improved his score by 11 points and scored 17 points (Figure 9). Mother of the child 2 said that her child is singing some song when he is in a good mood. Mother of child 5 replied that after watching some cartoons, child may say some words, some dialogues from the scenes.

Overall, as it could be seen in the graph 10, all children had a progress on the nine categories of language and communication skills. During the period of August 2013 till May 2014, child 1 scored 373 points; child 2 scored 237 points, child 3 scored 562 out of 902. Child 4 scored 488, child 5 scored 368 points. Despite slight variations, all children who took part in this research demonstrated significant improvements in all the expected areas of behavior. It is possible to say that ABA therapy effects on the progress of language development and communication skills among children with autism in Kyrgyzstan.

All mothers of participants observed significant improvements in all areas of the research. They complied that it became easier to communicate with their children. All mothers told that children started to pronounce some words or even sentences. Mother of child 5 replied: "Now he is able to ask for marmalade saying whole sentence: "I want marmalade", or "give me marmalade" Now in order to give him something I need to wait before he asks." Mother of child 3 saw improvements in communicational skills. She told that her child is able right now to distinguish emotions of other people and trying to react on those emotions. At the same time it was observed inappropriate behavior during the sessions (playing with hands and citing cartoons). These behavior may be was caused by the medications or/and gluten free diet. Mother replied: "We stopped dieting when got the results of the analysis. But now understand that my child became overexcited when ate some food with sugar." Mother of child 4 replied ABA therapy to be an effective tool for treatment children with autism. She observed some improvements in communication skills and language. She replied that "he is able to ask for help and look at me". At the same time her child learned to ignore other people "when he is not paying attention and trying to avoid eye contact, he is ignoring me and not only me." Child 4 learned to react on the situation and ask what he needs. Mother replied that her child could say "no" and apply when it is needed. Above the advantages of ABA therapy, some disadvantages were found. Mother of child 4 identified at this period of time her child saying everything without emotions. All words are monochrome and direct. She replied: "As my child is not having some progress on the emotions, I hope that some sessions would help him with it. May be it is little bit earlier right now."

The current research had several *limitations* that possibly affected the results. The therapists of the children were not ABA-qualified therapists. They used some principles of this therapy but their training in ABA was not sufficient enough to provide the most effective treatment. . Moreover, children were able to participate in the sessions 5 hours per week instead 40 hours per week of intensive therapy as it is common in US, for instance. There were also

some confounding variables that could affect the results. Thus bio-medical treatment that children started to take since March 2014 could negatively affect the development of language and communication among the participants.

As for the further studies they may focus on other ABA categories and skills such as writing, reading, math, play, fine motor, gross motor, and hygiene development. It would be interesting to compare the progress of children with autism who participated in ABA therapy and those who attend regular day care centers or just speech pathologists. Another suggestion could be to compare ABA therapy and other therapies for children with autism. The practical implication of this study is that the results from this research could be used as evidence for local state holders about the effectiveness of ABA-therapy and necessity to open special centers for children with autism on the basis of ABA therapy. Also, this therapy could be introduced to the special schools for developing language and communication skills.

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Figures

Figure 1

Cooperation and reinforcer effectiveness

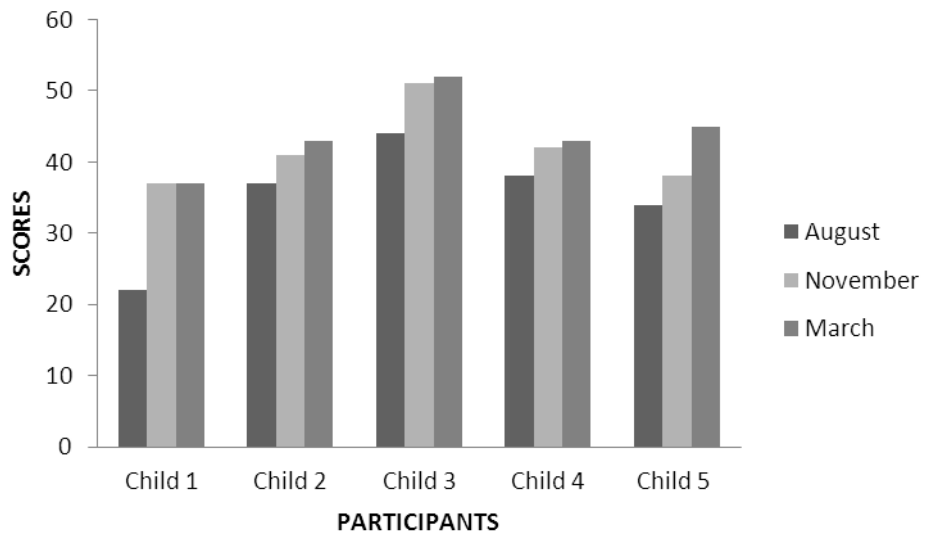


Figure 2

Visual Performance

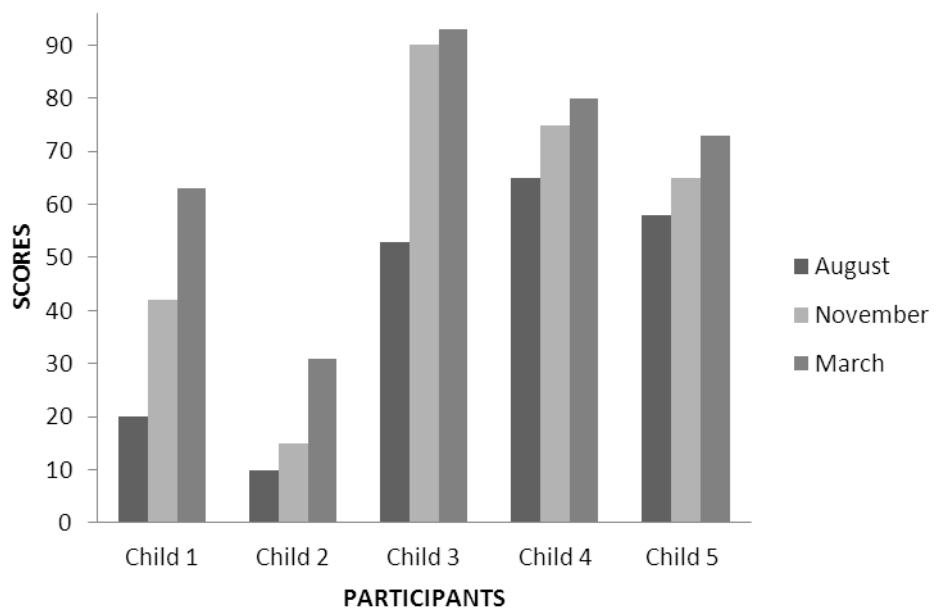


Figure 3

Receptive Language

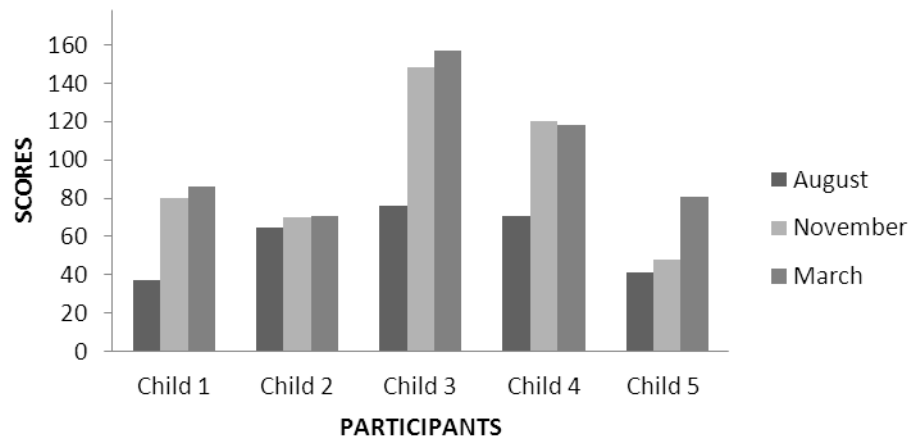


Figure 4

Motor Imitation

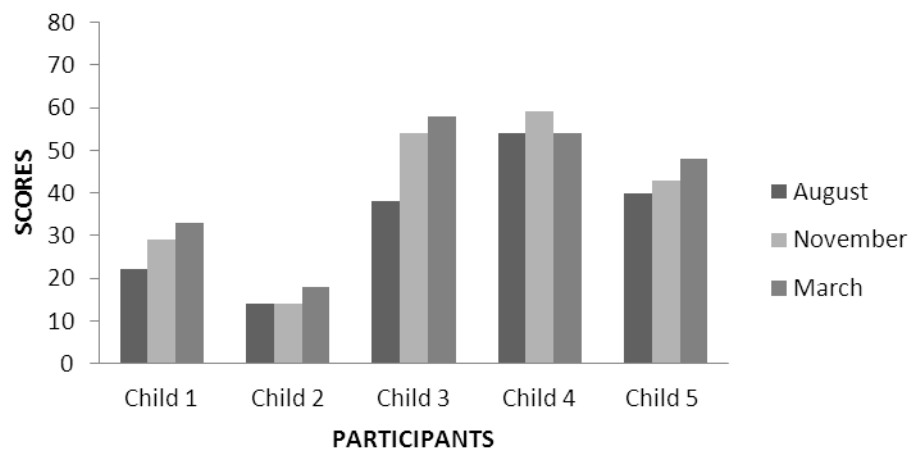


Figure 5

Vocal Imitation

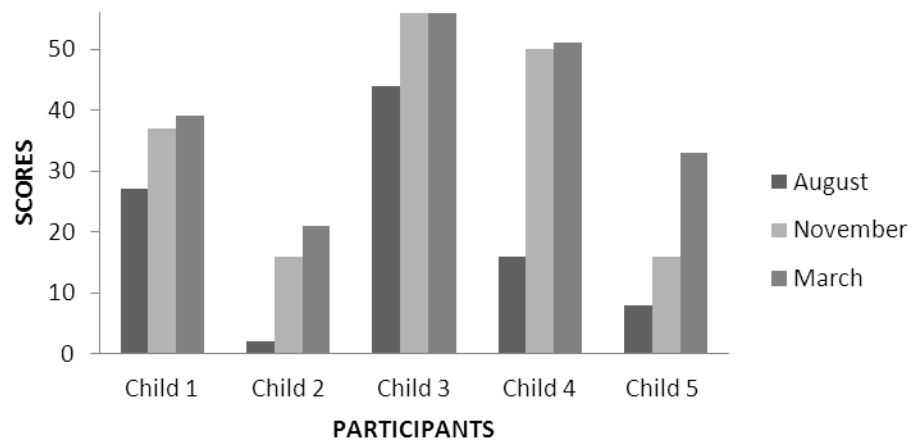


Figure 6

Requests

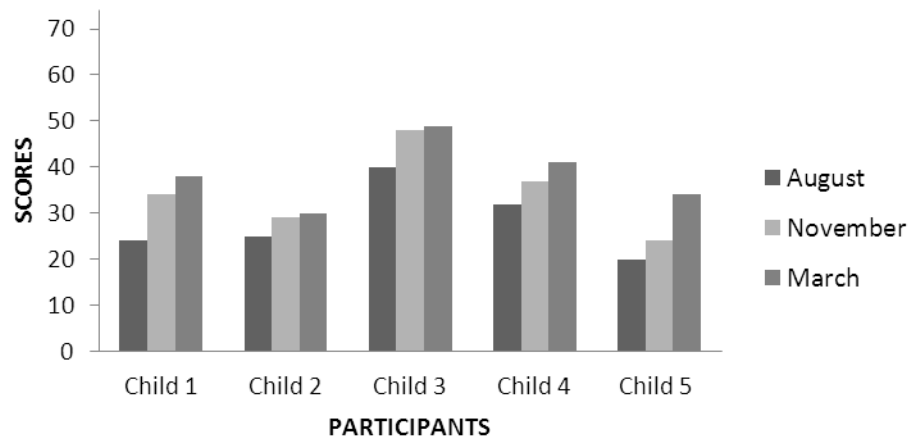


Figure 7

Labeling

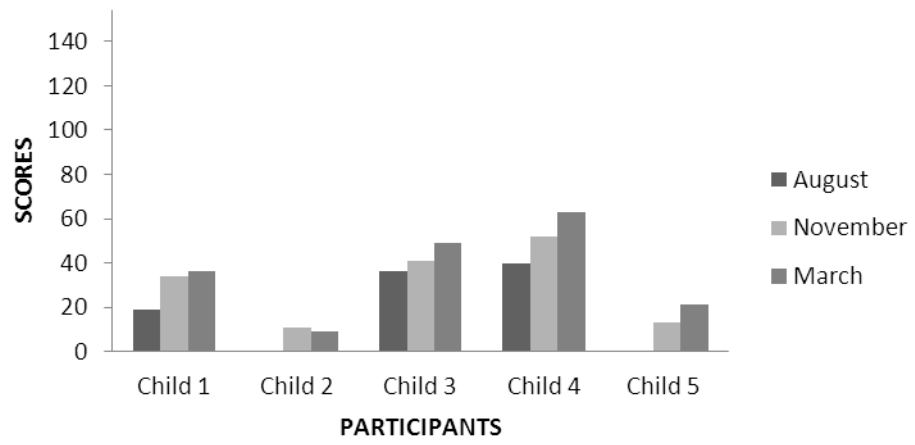


Figure 8

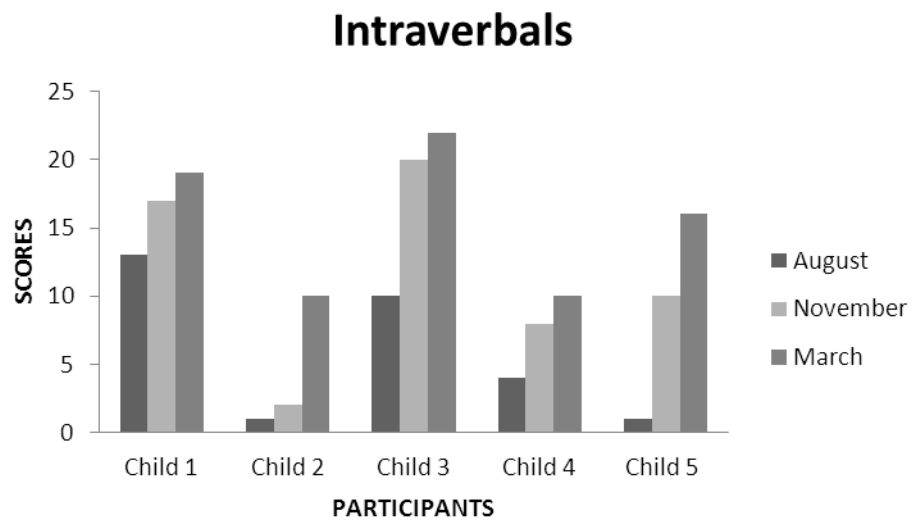


Figure 9