

The Association Between Cognitive Behavioral Therapy and Social Skill Improvement in Male
Children with Autism Spectrum Disorder

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Abstract

The purpose of this study is to determine if cognitive based therapy improves social skills in male children diagnosed with autism. Participants will be selected from autism clinics that provide cognitive based therapy as an option in the State of Florida, specifically Florida Autism center. A prospective cohort study design will be utilized for approximately four hundred (n=400) eligible participants who meet the set criteria of the screening process. Subjects are found to be eligible if they are male, 3-8 years of age, CARS diagnosis of autism, and measure at a functional level of two or three on the Autism Spectrum.

Those individuals who fit the requirements will be given the opportunity to partake in the study. We will be using the SF-36 to measure Quality of Life and also the Childhood Autism Spectrum Test, or CAST. We expect CAST scores to decrease as SF-36 scores increase. Subjects will be given \$10 VISA gift card at the completion of each successful evaluation.

(Word Count: 162)

Keywords: autism, male, children, cognitive behavioral therapy, social skills

Research Question

Is there an association between cognitive behavioral therapy and social skill improvement in male children diagnosed with autism spectrum disorder?

Hypothesis

H₁: CBT is associated with improvement in social skills among male children with autism.

H₀: There is no association between CBT and improvement in social skills of male children with autism.

H₂: CBT shows improvement in quality of life among male children with autism.

Review of Literature

Diagnosis of Autism

As of April 2018, the prevalence of Autism has increased by 15% according to the CDC which translates to 1/59 kids born in America will be diagnosed with Autism. This statistic is up from the last statistic 1/68, two years ago (Autism Speaks, 2018). According to the CDC the rate of diagnosis has been on the rise since 2004. These are impressive figures for a disorder with much to be learned about. In order to be diagnosed with Autism you must fit a certain criterion set out by The Diagnostic and Statistical Manual of Mental Disorders, Edition 5, or also known as the DSM-5. Being diagnosed with Autism is defined as having persistent deficits in verbal communication and socio-emotional reciprocity, non-verbal communication, and also having deficits in developing and/or maintaining relationships due to lack of understanding (Center for Disease Control, April 26, 2018). This along with the Childhood Autism Rating Scale or CARS diagnostic tool will be how we define Autism for our study.

Age Factor

The collection and analyzation of both relevant and recent applicable research and literature on autism has shown possible links between each study seen. One contributing factor that has been seen repeatedly in multiple research articles and by researchers alike is that age plays a part in developing autism.

A disorder in development which is distinctive due to the difficulty in communication, facial expression, social interaction, and speech impediment is known as autism (Kendall & Puleo 2011). This type of speech impediment is typically seen through repetitive speech patterns and incomplete thoughts. Early diagnosis of most children

with autism is important, but can be delayed until the child is of school age, three-five years old. On average, children are diagnosed with autism at the age range of 3.1 to 4.2 years of age. Those that has severe language deficits were given a diagnosis after the recommended time, typically 1.2 years or later(Mandell, Novak, & Zubritsky 2010). Some related actions associated with a decrease in diagnosis include hand flapping, toe walking, and sustained odd play. Some related actions that were correlated with an increase in diagnosis includes oversensitivity to pain and a hearing impairment.

Gender

What is Autism Spectrum Disorder, otherwise known as ASD? ASD refers to a broad range of conditions characterized by challenges with social skills, repetitive behaviors, speech and nonverbal communication. There is a significant uprising of ASD cases in the United States of America. This uprising brings a lot of new attention to this popular subject. Although there have not been enough studies to gather any hard conclusion as to why ASD is on the rise, back in 2014 “the overall prevalence of ASD among the 11 ADDM sites was 16.8 per 1,000 (one in 59)” (CDC, 2014). ASD has multiple classification levels, but 1 in every 59 newborns still have ASD. There is a developing trend among children with ASD. The trend being that the gender of infants born with ASD is showing that “Males were four times more likely than females to be identified with ASD” (CDC, 2014).

Treatment

Cognitive behavioral therapy (CBT) is a form of psychotherapy, one of which is highly researched, especially in regard to autism spectrum disorder (ASD) (Butler, Chapman, Forman, & Beck, 2006). CBT is utilized in multiple ways to help treat a wide range of behavioral issues in an individual's life. According to the National Health Service, CBT can be performed with the aid of a therapist in a one-on-one session or group scenario (2016). There are six structured

components that CBT encompasses, which include: psychoeducation, somatic management, cognitive restructuring, problem solving, exposure, and relapse prevention (Rotheram-Fuller & MacMullen, 2011). One of the specific objectives of cognitive behavioral therapy is to improve social functioning and anxiety among those with autism spectrum disorder (Maddox, Miyazaki, & White, 2017).

In previous studies, avoidance of social interactions and anxiety associated with those interactions improved after CBT intervention (Spain, Blainey, & Vaillancourt, 2017). Social interaction is a prevalent obstacle that most individuals with autism spectrum disorder face daily, therefore, improvements can increase quality of life among these individuals. Children, specifically, have difficulty regarding conceptualization of thought and feeling (Costescu, Vanderborght, & David, 2017). The thought is that the earlier one is started on CBT, the sooner they will start seeing the benefits.

Problem Statement

According to past research and literature that has been written on the subject, much of it is missing information of the lives of male adolescents diagnosed with autism, mainly in regards to QOL and social interactions of those who have been treated. The connection that different research associations and treatments have different effects on those who have autism or have been placed somewhere on the spectrum had been established versus non-treatment measures (Fayette & Bond, 2018). Another fact that had been established by this research article is in regards to the different therapeutic approaches to treating Autism. There's a significant improvement in social skills when patients had been placed in Cognitive Behavioral Therapy (CBT) among related treatments. Other studies have suggested that given the correct

environment and time, CBT can help move a patient from their current social functioning level to a level that is much higher in as little as a year. This study will focus on setting the foundation and establishing the correlation on the treatment of male adolescents with Autism and improved social index skills.

Methods

Study Design

For our study design, we plan to use a prospective cohort design to establish the correlation between the use of CBT on male children diagnosed with Autism and the overall improvement in QOL and social skills. For this study, we plan to have approximately 400 eligible participants that meet the set criteria. The set criteria for this study is the following: participants must be between 3 - 8 years of age, male, received the CARS diagnosis of Autism sometime over the course of their lives, and are classified at an ASD functional level of two or three. Any individuals who meet these criteria will pass the screening examination and be eligible to participate in the study. The exposure group of this study will receive cognitive behavior therapeutic measures, while those in the non-exposure group will be the study participants who do not receive the CBT treatment. As the study continues over the course of two years, participants will be assessed using a SF-36 surveying system and the CAST once every four months, where they'll answer short questions and rate them based on the answers given from the SF-36 and the number of times yes is marked on the CAST. As an incentive for participants in the study, each participant will be given \$10 after the completion of a survey at each follow up, not including the screener survey and the baseline survey.

Sampling

Methodology

For this study, the target population will include male children ages 3-8 years old diagnosed with autism and are being treated through cognitive behavior therapy. The participants for the source population will be selected through convenience sampling. The sampling frame will be made up of male children ages 3-8 years old diagnosed with autism. The source of these subjects will be drawn from the Florida Autism Center that offer cognitive behavior therapy treatments. We will use health records to indicate history of treatment. Those who are being treated at the facility will be screened through survey for inclusionary and exclusionary criteria. HIPAA will always be considered, and participants information will be confidential.

Sample Size

In this study, the overall sample size plans to be four-hundred ($n = 400$). The exposure group of this study intends to include two-hundred ($n = 200$) participants. The non-exposure group will be comprised of two hundred ($n = 200$) individuals as well. With an expected 30% attrition, a total of one-hundred and forty ($n = 140$) participants of the exposure group will remain in the study following the screening process. The non-exposure group will contain one-hundred and forty ($n = 140$) participants after completion of the screening process, leaving a total sample size of two-hundred and eighty ($n = 280$). As a means of reducing further attrition, researchers will routinely follow up with individuals once every four months. In order to keep the amount of attrition as low as possible participants will receive ten dollars in cash for each follow-up and will be provided with more information about the data collected regarding CBT and autism upon completion of the study.

Inclusion and Exclusion Criteria

After the sample population has been selected, the subjects that have agreed to participate in the study will be given a screener survey to identify whether or not they fit the necessary bounds needed for the study. Qualifying participants will have the following inclusionary standards: (1) Male sex, (2) between the ages of 3 and 8, (3) had been previously diagnosed with autism, per the CARS diagnosis criteria, (4) had been previously classified at an ASD functional level of two or three, and (5) voluntary participation.

Disqualified participants will be based off the following exclusionary standards: (1) female sex, (2) younger than 3 years of age, (3) older than 8 years of age, (4) had not received any diagnosis of autism, per the CARS diagnosis criteria, (5) had not been previously classified at an ASD functional level of two or three, and (6) coerced participation. Those who fit the inclusionary standards will be invited to be a participant in the study design.

Incentives

In order to reduce further attrition throughout the duration of this two-year study, participants will receive incentives for their participation and dedication. This voluntary study could not be possible without the commitment of the participants; therefore, appreciation should be shown to those that engage in the study. Participants will receive a \$10 VISA gift card after each survey completed every four months, in hopes of motivating participants to continue in this study. Individuals of this study that did not receive cognitive behavioral treatment will receive more extensive information about treatment regarding CBT and the data collected from this study about the general outcomes of CBT once the study has been completed. More information about local CBT options may be given to those who inquire.

Informed Consent Process

The objective of this study is to compare social skills improvement through CBT treatment compared to those without receiving CBT treatment in male children. Subjects of this study will be selected from Florida Clinics that have patients utilizing cognitive behavioral therapy for ASD. Throughout the duration of this study researchers will not breach the privacy of participants. Both the corporation of medical professionals on site, and family members and patients must be given. Access to existing and future medical records at the clinic is necessary to determine a baseline and a final standing. Before this study begins, researchers will also meet with participants to inform them of detailed information regarding this study and what is expected of them.

Individuals that are found to meet the inclusionary and exclusionary criteria based on their response to the screener survey given prior will be given the option to continue forward in the study. Participants who are eligible will submit their responses to an {online form} in order to measure their quality of life at the current time. Researchers are responsible for sending surveys via email to participants from the clinic after each session over the course of two years. If any misgivings or concerns arise during the study, they are free to report to any professional on staff or one of the researchers with their problem. If they choose not to agree to the study, a non disclosure form will be given to protect information from the studying becoming public before the study is completed. If they choose to agree to the requirements and rules of the study then they will provide their parents and them will provide their informed voluntary consent via signature in the presence of a researcher. All information is protected and used for the sole purpose of the experiment.

Operationalization

The independent variable of this study is cognitive behavioral therapy (CBT). A certified therapist specializing in cognitive behavior therapy teaches patients that they can control and interpret things in their environment. The therapist focuses on changing the automatic negative thoughts that can trigger depression, anxiety, and exacerbate emotional complications. Parents of the patients will be given a hard copy manual that outlines various forms of cognitive behavior treatment and what might be implemented ranging from: rational emotive behavior therapy, cognitive therapy, multimodal therapy, and dialectical behavior therapy. With regards to this study, patients will be required to attend a session once a week, ranging from 30 - 60 minutes, problem solving and discussing their thoughts and emotions. Sessions cannot be split up and must be completed in one sitting.

Quality of life (QOL) is the main result of this research. Quality of life is a primary concern when conducting evaluative research, with the preferable byproduct being any sign of improvement. As stated by Carr, Gibson, and Robinson, while there is no general consensus on the definition of quality of life, it can be evaluated on the nature of an individual's mental, physical and social wellbeing. The main analytical tool used in this study was the SF-36, which identified each patient's QOL in relation to cognitive based therapy. The SF-36 is a specific type of survey that contains questions used to measure the status of an individual, both physical and mental. Responses given correlate to a scale ranging from 0-100, with a larger value corresponding to a greater QOL.

The sample population is defined by specific inclusion and exclusion criteria, as stated previous. The specification of our sample population will also preserve homogeneity as baseline. The sample size is composed of male children, aged 3-8 years old, possess a CARS diagnosis of autism, and measure at level two or three on the Autism Spectrum. Autism leads to

impairment of a wide range of skills such as social skills, speech, repetitive reactions, and nonverbal yet unclear communication. These individuals must have parents that can consent to the treatment and comprehend English fully as to not have any confusion during the study. Consent may not be given until the parent has full knowledge of the parameters of the study. This study focuses on male children with autism because they are at a higher risk.

Screening Survey

The screening survey that will be used for the study consists of four questions relating to the different needs of the study, and general demographic information to limit the study population to desirable candidates. The first question relates to the gender identity of the potential participants; the study calls for male participants. The second question relates to the ages of the potential participants; the study calls for participants between the ages of 3 and 8. The third and fourth questions relate the mental functionalities and the diagnosis status of the potential participants; the study is looking for participants with a diagnosis of autism (by the CARS diagnostic criteria) and having a placement of ASD functional level two or three with their diagnosis.

Baseline Survey

The two surveys that we plan on using in our study are the SF-36 and a standardized ASD testing survey, created by (ADD INFO). Participants will obtain the same survey six more times after baseline, once every four months, for two years. For each and every survey completed, participants will be rewarded with a \$10 VISA gift card. For rewards to be given to participants, they'll be required to submit a response within two weeks. The primary survey being used for this study is the MOS 36-Item Short-Form Health Survey. This survey consists of 36 questions relating to the quality of life of the participants. As for our secondary survey, we

shall use an ASD social skills diagnostic test to see how well participants have improved when compared to baseline and previous observations.

Reliability and Validity

The reliability and validity of the SF-36 has been well defined through much research. According to a study published by The British Medical Journal found evidence of reliability. Cronbach's alpha greater than 0.85 with the reliability coefficient being greater than 0.75 in all dimensions except social functioning(Brazier et al.,1992). It also found that its is superior in finding problems like low levels of health in patients who scored a 0 on the Nottingham health profile.

The CAST was tested using the test-retest method and showed good reliability and accuracy. With the cut point being 15 the kappa statistic was 0.70, 97% (95% CI) of children not moving below cut off point. Spearman's Rho was used as a correlation measurement between the test-retest and showed a 0.83(Williams et al., 2005).

We expected the two surveying test to produce good reliable and valid data that can be used for our study.

Confidentiality

Maintaining confidentiality is a paramount obligation in this research study. Participants' identities will be protected by ensuring the nondisclosure of any personal or medical records outside of this study. The Florida clinics that we receive patient medical records from, as well as the IRB and the research team conducting this study, will be the few individuals with access to patient information. Debriefing the participants on who will have potential access to personal information will help to ensure the security of their information. Specific individual characteristic

information that is collected during this study will not be made public or used in potential future studies.

The data collection process will include careful methodology in order to protect the identities of participants. No private identifying information will be used and each participant will be given a different alias that will be confidentially matched with the individual. Digital information will only be accessed by authorized personnel on password-protected electronics. Once researchers and authorized organizations have finished viewing or inputting data, they are required to logout and close out of secure documents. Hard copies of patient information, such as: medical records, data from this research study, and any other possible identifying information will be secured in the possession of the authorized individuals. If individuals are to leave this study before the study has ended, their information will still be analyzed and coded where applicable. Proper disposal techniques will be enacted at the conclusion of this study to ensure identifiable information is eliminated for privacy purposes.

Analytical Plan

General Information

Descriptive statistics will be used to compare the CBT of autistic males exposed versus the non-exposed groups. The two analytical tools used will be the CAST (Childhood Autism Spectrum Test) and SF-36. A bivariable analysis will be used to compare the social skills and quality of life of participants. The critical value alpha will be set at 0.05. Any probability value equal to or lower than this is considered significant findings. If the value is greater than 0.05 then it is said to be not significant.

Hypothesis Testing

In order to test H_1 a Cox Proportional Hazard Model will be the primary tool to analyze the association between CBT and improvement of social skills. Scores from the CAST scale will

determine the severity of social skill impairment. These scores will be used to compare those who received CBT against those who did not receive CBT for risk ratio.

Similar to the testing of H_1 , the primary tool for analyzing H_2 will be a Cox Proportional Hazard Model to analyze the association between CBT and Quality of Life. Scores from SF-36 will be used to determine the quality of life of the participants.

Ethical Consideration and limitation

Ethical Considerations

This study is being conducted to further conduct research on whether Cognitive Behavioral Therapy (CBT) is effective for male children, ages 3 to 8 years of age with autism that have mild to severe levels, between 2 and 3, based off a symptomatic categorization. During this study we aim to provide absolute justice, beneficence and autonomy to all participants. To accomplish this, each participant and their guardian(s) will be briefed on how the research study will be conducted. Then an explicit consent form will be asked to be voluntarily be signed by the guardian(s), if they agree to the study. Participants and their guardian(s) will be assured that all personal information will be confidential, pursuant to Florida's current HIPAA laws. Furthermore, they will also be able to leave the study at any time without penalty. However, they will be asked to complete the study in its entirety. An incentive will be used to reduce attrition, allowing the study to gather significant data.

Limitations

Over the proposed two years that this study is projected to be completed within, the biggest limitation will be attrition. A 30% attrition rate will be used, so an over-sized population can be gathered at the beginning of the study. By the end of the study, we propose there to be enough participants to make the data significant. Since this design is prospective and is using

surveys to track progress. This survey is subject to be distributed every 16 weeks. The participants will have one week to complete the survey and return same. Otherwise, they will be considered to have withdrawn from the study.

Each clinic may not use the exact same set of exercises for their CBT treatment, as this may skew data, since each participant is not getting the same set of treatment exercises. The survey will be filled out by the guardian(s) of the participant and the therapist conducting the CBT. Each person completing the survey may view the amount of progress differently leading the results be bias. Guardian(s) may see more or less progress than the therapist does.

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Appendix A: Budget

Expense	Reason	Calculation	Cost
Staff			
Statistician	For reliable expression of data	Average yearly salary \$75,000 / 52 weeks and then multiplied by 4 for estimated time employed	\$5,800.00
Florida Autism Clinic Staff	To give appropriate treatment and administration of forms		\$0
Supplies			
Computer	Log data and document events	Cost of MacBook Pro per Apple website	\$2,799.00
Printer	To print necessary forms	Small office printer on Best Buy website	\$500
Ink	To print necessary forms	Ink cartridges for 2 refills \$79 x 2	\$200
Paper	To print necessary forms	one 500 count ream is \$8.30	\$120
Print Consent Forms	To help participants understand the study and for us to obtain voluntary consent	500 prints = one ream	\$8.30

Print Screener	To appropriately assess potential participants for the study	500 prints = one ream	\$8.30
Print SF 36	To evaluate the quality of life in participants	2400 prints = 5 reams	\$41.50
Print CAST	To evaluate symptoms of autism in participants	2400 prints = 5 reams	\$41.50
Incentive			
VISA Gift Card	Monetary offering for participation in study	400 completed screenings + (400 cast and sf 36 forms x 6)	28,000
Total			\$37,518.59

Appendix B Timeline

Locate and gather participants	August 1 - September 30 2019	Site clinic will distribute the screener survey to all willing potential participants
	October 1 2019	The study representative will meet with the parents of the study participants and discuss informed consent. They will sign the form and have it on file by October 7 2019
Survey Dissemination	October 14-18, 2019, February 17-21, 2020, June 15-19, 2020, October 12-16, 2020, February 15-19, 2021, June 14-18, 2021, October 11-15 2021	Through the course of each 5-day period the surveys will be completed on site
Analysis	November 2021	All data will be gathered and analyzed by statistician

Appendix C: Consent Form



UNIVERSITY OF
CENTRAL FLORIDA

Title of research study:

CBT shows significant improvement in social skills among male children with autism

Investigator(s):

Eric Bellevue, Nickolas Godley, Charles Imwalle, Brendan Langford, Muhammed Shelleh, Aynana Ward

How to Return this Consent Form:

After being explained the process of this study by one of our researchers you will be asked to sign this consent form on behalf of your child. Signing this form allows your child to participate in the study, if you feel uncomfortable at any time during the study you may leave without any penalty.

Why is my child being invited to take part in a research study?

Your child is being invited to take part in a research study because he meets the inclusionary and exclusionary factors, those being that he is a male between the ages of 3 and 8. He also has a CARS score of level 2 or 3.

Why is this research being done?

By doing this research we aim to fill a gap in previous research. The purpose of this study is to determine if CBT will have a significant improvement on social skills in male children ages 3 through 8 with autism.

How long will the research last and what will my child need to do?

We expect that your child will be in this research study for 2 years. Your child will either get CBT treatment or not. This depends on you. We will not ask that you keep treatment from your child, but if you do not do treatment then we would like to follow up as part of the study. The child will not be completing the surveys, but you as the guardian(s) will be completing them. Every 4 months you will be asked to complete the same two surveys as the baseline. Each can be completed in usually 15 minutes or less. Upon completion there will be a \$10 VISA gift card given to you

Is there any way being in this study could be bad for my child?

The risks to participation are minimal and do not exceed the risks associated with activities found in daily life.

Will being in this study help my child any way?

Having your child participate in this study will give knowledge and better understanding on how to improve social skills in males with autism. We cannot promise any benefits to your child or others from taking part in this research. However, possible benefits include knowledge, understanding and social activities.

What happens if I do not want my child to be in this research?

Participation in research is completely voluntary. You can decide to have your child participate or not to participate.

Detailed Information: The following is a more detailed information about this study in addition to the information listed above.

What should I know about a research study?

- Someone will explain this research study to you and your child.
- Whether or not you allow your child to take part is up to you.
- You can choose not to allow your child to take part.
- You can agree to allow your child to take part and later change your mind.
- Your decision will not be held against you or your child.
- You can ask all the questions you want before you decide.

Who can I talk to?

If you have questions, concerns, or complaints, or think the research has hurt your child, talk to the research team: at the UCF College of Health Professions and Sciences, Department of Health Sciences, (407)-823-0171

This research has been reviewed and approved by an Institutional Review Board ("IRB"). You may talk to them at 407-823-2901 or irb@ucf.edu if:

- Your questions, concerns, or complaints are not being answered by the research team.
- You cannot reach the research team.
- You want to talk to someone besides the research team.
- You have questions about your child's rights as a research subject.
- You want to get information or provide input about this research.

How many people will be studied?

We expect 400 people will be in this research study.

What happens if I say yes, but I change my mind later?

You can choose to have your child leave the research at any time it will not be held against you or your child. If you decide to leave the research, contact the investigator so that the investigator can discontinue your surveys. Data that was previously collected from you will be used.

What happens to the information collected for the research?

Efforts will be made to limit the use and disclosure of your child's personal information, including research study to people who have a need to review this information. We cannot promise complete secrecy. Organizations that may inspect and copy your information include the IRB and other representatives of this organization. Each participant will be given a corresponding number, this makes the study more secure. If abuse or neglect is found to be present, then information may be released to the appropriate authorities.

Signature Block for Children

Your signature documents your permission for the named child to take part in this research.

Printed name of child

Signature of parent or individual legally authorized to
consent to the child's general medical care

Date

Printed name of parent or individual legally authorized to
consent to the child's general medical care

☐ Parent
☐ Individual legally
authorized to consent to the
child's general medical care
(See note below)

Note: Investigators are to ensure that individuals who are not parents can demonstrate their legal authority to consent to the child's general medical care. Contact legal counsel if any questions arise.

Signature of parent

Date

Printed name of parent

If signature of second parent not obtained, indicate why: (select one)

- | | |
|---|---|
| ☐ The IRB determined that the permission of one parent is sufficient | ☐ Second parent is incompetent |
| ☐ Second parent is deceased | ☐ Second parent is not reasonably available |
| ☐ Second parent is unknown | ☐ Only one parent has legal responsibility for the care and custody of the child |

Absent ☐

- ☐ Obtained
- ☐ Not obtained because the capability of the child is so limited that the child cannot reasonably be consulted.

Signature of person obtaining consent and assent

Date

Printed name of person obtaining consent

IRB Approval Date

My signature below documents that the information in the consent document and any other written information was accurately explained to, and apparently understood by, the subject, and that consent was freely given by the subject.

Signature of witness to consent process

Date

Printed name of person witnessing consent process

Appendix D

The Childhood Autism Spectrum Test or CAST (formerly the “Childhood Asperger’s Syndrome Test”) is a 39-item, yes or no evaluation aimed at parents. The questionnaire was developed by [ARC](#) (the Autism Research Centre) at the University of Cambridge, for assessing the severity of autism spectrum symptoms in children.

Please read each question *carefully* and select the most accurate response.

	Yes	No
1. Does s/he join in playing games with other children easily?		
2. Does s/he come up to you spontaneously for a chat?		
3. Was s/he speaking by 2 years old?		
4. Does s/he enjoy sports?		
5. Is it important to him/her to fit in with the peer group?		
6. Does s/he appear to notice unusual details that others miss?		
7. Does s/he tend to take things literally?		
8. When s/he was 3 years old, did s/he spend a lot of time pretending (e.g., play-acting being a superhero, or holding teddy's tea parties)?		
9. Does s/he like to do things over and over again, in the same way all the time?		
10. Does s/he find it easy to interact with other children?		
11. Can s/he keep a two-way conversation going?		
12. Can s/he read appropriately for his/her age?		
13. Does s/he mostly have the same interests as his/her peers?		

14. Does s/he have an interest which takes up so much time that s/he does little else?		
15. Does s/he have friends, rather than just acquaintances?		
16. Does s/he often bring you things s/he is interested in to show you?		
17. Does s/he enjoy joking around?		
18. Does s/he have difficulty understanding the rules for polite behavior?		
19. Does s/he appear to have an unusual memory for details?		
20. Is his/her voice unusual (e.g., overly adult, flat, or very monotonous)?		
21. Are people important to him/her?		
22. Can s/he dress him/herself?		
23. Is s/he good at turn-taking in conversation?		
24. Does s/he play imaginatively with other children, and engage in role-play?		
25. Does s/he often do or say things that are tactless or socially inappropriate?		
26. Can s/he count to 50 without leaving out any numbers?		
27. Does s/he make normal eye-contact?		
28. Does s/he have any unusual and repetitive movements?		
29. Is his/her social behaviour very one-sided and always on his/her own terms?		
30. Does s/he sometimes say "you" or "s/he" when s/he means "I"?		
31. Does s/he prefer imaginative activities such as play-acting or story-telling, rather than numbers or lists of facts?		

32. Does s/he sometimes lose the listener because of not explaining what s/he is talking about?		
33. Can s/he ride a bicycle (even if with stabilizers)?		
34. Does s/he try to impose routines on him/herself, or on others, in such a way that it causes problems?		
35. Does s/he care how s/he is perceived by the rest of the group?		
36. Does s/he often turn conversations to his/her favorite subject rather than following what the other person wants to talk about?		
37. Does s/he have odd or unusual phrases?		
38. Have teachers/health visitors ever expressed any concerns about his/her development?		
39. Has s/he ever been diagnosed with any of the following: Language delay, ADHD, hearing or visual difficulties, Autism Spectrum Condition (including Asperger's Syndrome, or a physical disability?		

Appendix E

SF-36 Questionnaire

Name: _____

Date: _____

Gender: M / F

Age: _____

1. In general, would you say your health is:

1 - Excellent

2 - Very good

3 - Good

4 - Fair

5 - Poor

2. **Compared to one year ago**, how would you rate your health in general **now**?

1 - Much better now than one year ago

2 - Somewhat better now than one year ago

3 - About the same

4 - Somewhat worse now than one year ago

5 - Much worse now than one year ago

The following items are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much?

	Yes, limited a lot	Yes, limited a little	No, not limited at all
3. Vigorous activities , such as running, lifting heavy objects, participating in strenuous sports	1	2	3
4. Moderate activities , such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	1	2	3
5. Lifting or carrying groceries	1	2	3
6. Climbing several flights of stairs	1	2	3
7. Climbing one flight of stairs	1	2	3
8. Bending, kneeling, or stooping	1	2	3
9. Walking more than a mile	1	2	3
10. Walking several blocks	1	2	3
11. Walking one block	1	2	3
12. Bathing or dressing yourself	1	2	3

During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of your physical health**?

Yes No

- | | | |
|---|---|---|
| 13. Cut down the amount of time you spent on work or other activities | 1 | 2 |
| 14. Accomplished less than you would like | 1 | 2 |
| 15. Were limited in the kind of work or other activities | 1 | 2 |
| 16. Had difficulty performing the work or other activities (for example, it took extra effort) | 1 | 2 |

During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of any emotional problems** (such as feeling depressed or anxious)?

- | | Yes | No |
|--|-----|----|
| 17. Cut down the amount of time you spent on work or other activities | 1 | 2 |
| 18. Accomplished less than you would like | 1 | 2 |
| 19. Didn't do work or other activities as carefully as usual | 1 | 2 |

20. During the **past 4 weeks**, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

1 - Not at all

2 - Slightly

3 - Moderately

4 - Quite a bit

5 - Extremely

21. How much **bodily** pain have you had during the **past 4 weeks**?

1 - None

2 - Very mild

3 - Mild

4 - Moderate

5 - Severe

6 - Very severe

22. During the **past 4 weeks**, how much did **pain** interfere with your normal work (including both work outside the home and housework)?

1 - Not at all

2 - A little bit

3 - Moderately

4 - Quite a bit

5 - Extremely

These questions are about how you feel and how things have been with you **during the past 4 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the **past 4 weeks**...

All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
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23. Did you feel full of pep?	1	2	3	4	5	6
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24. Have you been a very nervous person?	1	2	3	4	5	6
--	---	---	---	---	---	---

25. Have you felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5	6
---	---	---	---	---	---	---

26. Have you felt calm and peaceful?	1	2	3	4	5	6
--------------------------------------	---	---	---	---	---	---

27. Did you have a lot of energy?	1	2	3	4	5	6
-----------------------------------	---	---	---	---	---	---

28. Have you felt downhearted and blue?	1	2	3	4	5	6
---	---	---	---	---	---	---

29. Did you feel worn out?	1	2	3	4	5	6
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30. Have you been a happy person?	1	2	3	4	5	6
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31. Did you feel tired?	1	2	3	4	5	6
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32. During the **past 4 weeks**, how much of the time has **your physical health or emotional problems** interfered with your social activities (like visiting with friends, relatives, etc.)?

1 - All of the time

2 - Most of the time

3 - Some of the time

4 - A little of the time

5 - None of the time

How TRUE or FALSE is **each** of the following statements for you.

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
33. I seem to get sick a little easier than other people	1	2	3	4	5
34. I am as healthy as anybody I know	1	2	3	4	5
35. I expect my health to get worse	1	2	3	4	5
36. My health is excellent	1	2	3	4	5

Appendix F

Screeners Survey

Screeners Survey

Thank you for agreeing to participate in this survey. Please answer the following questions by selecting the most appropriate answer. Your responses will be kept confidential.

1. Is your child male?
 - a. Yes
 - b. No
2. Is your child between the ages of 3 and 8?
 - a. Yes
 - b. No
3. Has your child been diagnosed with autism, per the CARS diagnosis criteria?
 - a. Yes
 - b. No
4. Has your child been classified at an ASD functional level of two or three?
 - a. Yes
 - b. No