

# Research

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## **The effectiveness of the home-based integrated listening system (iLs) program for children with autism**

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### **RESULTS SUMMARY:**

The purpose of this multi-site intervention study was to examine the effectiveness of the iLs Focus home program with children 4 to 8 years of age with Autism Spectrum Disorder (ASD). This mixed-methods study (single-case series with pre/post-testing) of 18 children with ASD supported outcome findings of a previous iLs practitioner survey on the perceived effectiveness of the iLs program.

Results found significant gains across multiple subjective and objective outcome measures in areas of:

- social skills and emotional regulation;
- quantity and quality of atypical and problem behaviors including behavior during treatment;
- number and severity of autistic behaviors; and overall functional adaptive behavior skills;
- visual, fine and gross motor skills including body functions and motor planning;
- auditory listening skills.

Effect sizes\* of significant outcomes ranged from  $d = .28$  to 1.45 with over half of the outcomes having effects of greater than .50 indicating the majority of outcomes demonstrated rather large, easily observable positive changes. Improvements in social skills on the Social Responsivity Scale were particularly notable with large significant effects in the areas of social awareness ( $d = .88$ ), social cognition ( $d = 1.04$ ), social communication ( $d = .98$ ), autistic mannerisms ( $d = .77$ ) and total score ( $d = .96$ ). Overall, results demonstrated that the effects of the iLs program were significant, of generally large magnitude, easily observable, and sustained throughout the post-intervention baseline. The iLs home program was thus supported as an effective intervention for improving multiple areas of functioning in children with autism spectrum disorder.

\*Effect sizes reflect the magnitude and observability of change and are reported as a Cohen's  $d$ . Effects greater than .35 are considered moderate in size. Effects greater than .50 are considered moderate-large and effects greater than .80 are large.

### **STUDY SUMMARY:**

This study consisted of two parts. Part One examined the performance of 18 participants with a no treatment-treatment-no treatment (A-B-A) design using repeated weekly measures completed by parents and monthly repeated measures completed by both parents and therapists as described below. This part of the study documented that gains in outcomes of social skills, emotional regulation, decrease

## Research

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in number and severity of atypical behaviors, motor skills, and auditory listening skills observed over time were due to the iLs intervention provided and not just maturity. This was established by the presence of a significant treatment effect during the intervention phase followed by a withdrawal effect in the second baseline phase in all parent-reported measures and most therapist measures in over two-thirds of individual cases and in the group as a whole when participant data was combined.

Given the establishment of a treatment effect in Part One, Part Two of the study then examined pre- and post-testing as group data to determine if, even with a withdrawal effect in the second baseline, the effects of the iLs program sustained across baseline sufficiently to produce significant post-study gains.

Eighteen children with pre-existing diagnoses of autism, 14 males and 4 females, participated in the study. All participants had no other significant diagnoses other than anxiety and communication difficulties typically found with an autism diagnosis. All were within an average range of intelligence and were not receiving sensory integration intervention during the study. Participants were largely Caucasian, upper-middle class and had highly educated parents.

The intervention provided was the 12-week, 60-sessions, iLs Focus Sensory Motor home program. Children listened to modified music using headphones with bone conduction for one hour per day, five days per week. Each hour session included 10-15 minutes of iLs's multi-sensory movement-based activities. Each child was evaluated and monitored throughout baseline and intervention phases by an occupational, physical or speech therapist trained in the iLs program. The majority of clinicians involved in the study had over 15 years professional experience, were iLs trained at the Advanced level, and had used the iLs program for over four years. The child's therapist conducted pre- and post-study assessments, consulted with the parents on a weekly basis, and conducted monthly in-clinic assessments.

Pre- and post-testing was completed before the first no-treatment baseline period and after the end of the last no-treatment baseline using objective measures of the SCAN-C, Test of Auditory Processing Skills (TAPS), M-FUN, and clinical observations. Additional measures completed by therapists included the M-Fun Observations During Testing, M-Fun Classroom Observations and global impressions scales. Parents completed the Social Responsivity Scale (SRS), the Social Skills Improvement System (SSiS), M-Fun Home Observations, Adaptive Behavior Assessment System (ABAS), global impressions scales, and parent observations of social, emotional, auditory listening, and atypical behaviors. Portions of the SCAN-C, clinical observations, M-Fun Classroom Observations and Home Observations, and parent and therapist global impressions scales were completed monthly. The parent observation and global impressions scales were also completed weekly.