

Hope Focus System

A Pilot Study Using Movement and Connection to Support Neurodivergent Children

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THE COGLEAP APPROACH — HOPE FOCUS SYSTEM



PROFILE

Assess 14 functional domains (FAS)



PERSONALIZE

AI-informed movement mix + rhythmic neurotech



ADAPT

Real-time feedback; progressive optimization

INTRO / BACKGROUND

- Children with neurodevelopmental conditions are often supported through symptom-focused approaches.
- The Hope Focus System (HFS) uses the Fundamental Abilities Survey (FAS) to map each child's functional profile.
- HFS combines targeted movement, rhythmic music stimulation, and a human coach to guide personalized training.

BACKGROUND

Autistic children and children referred for neurodevelopmental difficulties are frequently assessed through the lens of their behavioral presentations — attention, social engagement, emotional regulation — without a unifying framework for the shared functional differences beneath them. Motor differences are common in autistic children, with prevalence estimates up to 87% in population-based samples (Licari et al., 2020), and often precede social-communicative differences (Bhat, 2021).

Movement-based programs have been associated with motor gains and, in some contexts, broader gains in social and executive function (Auld et al., 2025), and exercise interventions show moderate-to-large effects on attention and executive function in children with attentional differences (Liang et al., 2021). This study examined pre–post FAS outcomes in autistic and non-autistic neurodivergent children using a **diagnosis-blind, profile-directed** approach — tailoring movement emphasis to each child's functional profile rather than their diagnostic label.

METHODS

Design

Retrospective observational cohort from routine clinical care at two Cogleap Centers (Irvine & Silicon Valley, CA). Fully de-identified.

Intervention

Hope Focus System — 8–12 weeks, 1–2 sessions/week (median 40–41 hrs both groups). Individualized movement across 9 categories + rhythmic music via bone-conduction + coach.

Analysis

Within-group pre–post change (two-sided Wilcoxon signed-rank; effect size $r = |Z|/\sqrt{n}$). Between-group change scores ($\Delta = \text{post} - \text{pre}$; Mann–Whitney U). Benjamini–Hochberg FDR correction ($q = .05$) reported as a sensitivity check. Between-group tests are exploratory.

Participants

34 children (17 autistic, mean 10.1 y; 17 non-autistic neurodivergent, mean 10.6 y). Groups matched on age and session count. Subgroups emerged from the data; not prespecified.

Measure

Fundamental Abilities Survey (FAS), parent-reported, adapted from the 5-15R (Kadesjö et al., 2004). 14 domains scored 0–2; higher = greater difficulty.



Breathing



Stretching / Flex



Dexterity



Hand-Eye Coordination



Balance



Core Strength



Body Coordination



Aerobic Endurance



Crossing Midline

Aggregate exercise content was broadly similar across groups: 8 of 9 movement categories did not differ, and total training volume was equivalent (median 246 vs. 269 exercises, $p = .541$). Groups differed only in stretching/flexibility emphasis ($p = .025$).

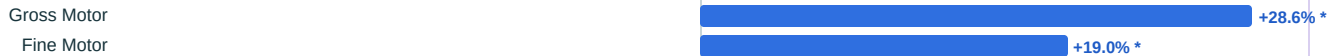
RESULTS — WITHIN-GROUP CHANGE (ALL 14 FAS DOMAINS)

Positive bars (blue) = parent-reported **improvement** (skill increase / reduced difficulty). Negative bars (green) = skill decrease. Significance from two-sided Wilcoxon signed-rank tests.

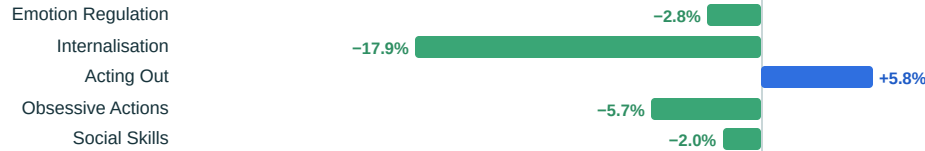
Autistic Group (n = 17) — Pre-Post % Change in FAS Domain Scores

Two-sided Wilcoxon signed-rank: * p < .05, ** p < .01, *** p < .001

MOTOR



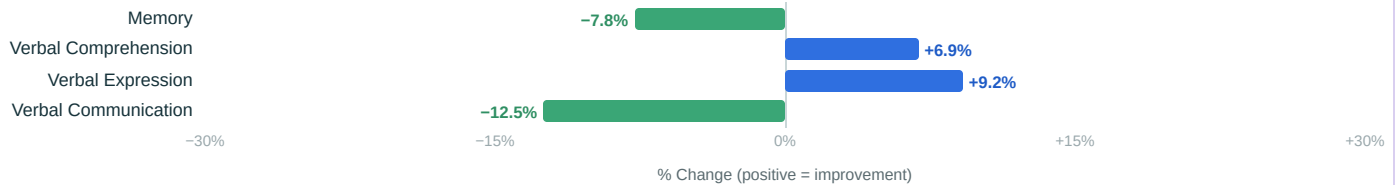
SOCIAL-EMOTIONAL



EXECUTIVE FUNCTION



MEMORY & LANGUAGE



*** Significant improvements: Gross Motor (p = .008, r = .645) · Fine Motor (p = .015, r = .589) — both large effects. Directional but non-significant trends in Executive Functions and Language were observed. No domains survived Benjamini–Hochberg correction.

Non-Autistic Neurodivergent Group (n = 17) — Pre-Post % Change in FAS Domain Scores

Two-sided Wilcoxon signed-rank: * p < .05, ** p < .01, *** p < .001

MOTOR



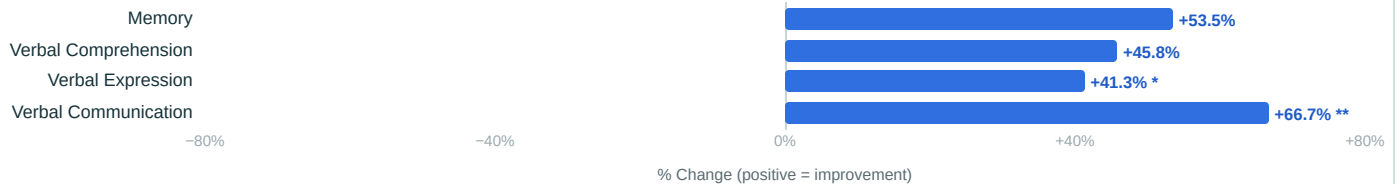
SOCIAL-EMOTIONAL



EXECUTIVE FUNCTION



MEMORY & LANGUAGE



*** 10 of 14 domains improved significantly. Largest gains: Verbal Communication (+66.7%), Organizing/Planning (+65.2%), Hyperactivity/Impulsivity (+57.8%), Attention (+57.4%). All 10 significant domains survived Benjamini–Hochberg correction (q < .05).

RESULTS — BETWEEN-GROUP DIFFERENCES

Domains with a significant group × intervention interaction (change-score comparison, Mann–Whitney U). Positive bars (blue) = greater improvement.

Gross Motor

$p = .007^{**}$ · ASD ↑



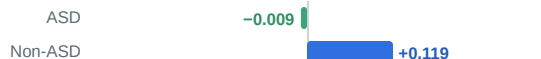
Internalisation

$p = .003^{**}$ · Non-ASD ↑



Emotion Regulation

$p = .018^{*}$ · Non-ASD ↑



Mean Change Score (positive = improvement)

* $p < .05$ · ** $p < .01$. Only Gross Motor and Internalization survived BH correction; attention and hyperactivity trends ($p = .084$, $p = .056$) were large but did not survive correction and are likely underpowered.

The two subgroups changed in different domains. The autistic group began HFS training with markedly elevated motor profiles, and improved primarily in motor domains. The non-autistic group entered with elevated attentional and executive profiles and improved across attentional, executive, social-emotional, and verbal domains.

Notably, the groups did **not** differ statistically at baseline on attention ($p = .069$) or hyperactivity/impulsivity ($p = .917$), yet these were among the domains whose trajectories also diverged — suggesting the differing patterns may not simply be a function of differing starting points.

Both groups received broadly similar aggregate exercise content, and the differing patterns of change may not be explained by differing exposure alone. Whether they reflect the algorithm's individualized prescription, baseline profile, diagnostic status, or non-specific effects of participation require further studies in the future.

DISCUSSION / CONCLUSION

KEY FINDINGS

- Autistic group: significant gains in gross and fine motor skills.
- Non-autistic group: 10 of 14 domains improved significantly (spanning socioemotional, executive function, and memory & language), all surviving BH correction.

PATTERN OF CHANGE

- Autistic group: change concentrated in motor domains.
- Non-autistic group: change in attentional, executive function, memory and language domains.

IMPLICATIONS

- Supports a profile-directed, diagnosis-blind approach.
- Suggests neurotype-differentiated mechanisms and outcomes worth testing prospectively.

LIMITATIONS & NEXT STEPS

- Retrospective design, no control group.
- Parent-reported FAS may carry subjective bias.
- Small sample; several between-group trends likely underpowered.
- A controlled trial with validated outcomes is needed to establish efficacy, mechanism, and validation.

ETHICS, CONFLICT OF INTEREST & FUNDING

Ethical approval. Reviewed by WCG IRB and determined exempt under 45 CFR 46.104(d)(4) (exempt determination no. 1410985; IRB tracking no. 20262051; approved 06/04/2026), and conducted in accordance with the Declaration of Helsinki. All parents/guardians provided written informed consent at intake for de-identified data use.

Conflict of interest. The author is an employee of Cognitive Leap Solutions Inc. and the developer of the HFS — a financial and intellectual conflict of interest, which is declared. All claims are explicitly exploratory and pilot in nature. **Funding.** No specific grant; data collection occurred as part of routine clinical operations.

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This study presents preliminary real-world data from a retrospective pilot study and is intended to inform future controlled trials with validated outcomes. Not intended to imply clinical efficacy. FAS = Fundamental Abilities Survey. BH = Benjamini–Hochberg false discovery rate correction.

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