

# Comparative Adaptive-Behavior Outcomes in Autism: A Meta-Analytic Synthesis Versus a Multicultural Vineland-3 Clinical Cohort

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## Abstract

The present article provides practical insights for clinicians and researchers in autism intervention. It juxtaposes (i) the most significant recent meta-analyses of adaptive-behavior interventions in autism with (ii) a retrospective Vineland-3 study of 16 linguistically diverse autistic clients. This comparison clarifies where intervention effect sizes map into real-world clinical deficits, offering actionable recommendations for intervention strategies.

**Methods.** Systematic reviews published 2021-2025 that provided standardized mean changes on Communication, Socialization, Daily-Living Skills (DLS) or composite outcomes were extracted and compared with domain-level scores from the multicultural cohort (ages one y 10 m–27 y).

**Results.** Meta-analytic motor-based interventions yielded moderate benefits for combined social/communication outcomes (Hedges  $g = 0.47$ ) but diminished by 0.29 SD for each year above age nine y. In our cohort, Communication averaged 54 ( $\geq 1.5$  SD below mean) and declined 4 points per chronological year ( $\rho = -.71$ ,  $p = .003$ ). DLS presented as a relative strength ( $M = 63$ ) yet remained 2.5 SD sub-normative. Socialization mirrored the meta-analytic gain trajectory ( $g = 0.46$ ) but again lagged 43 points below population norms. Intelligence moderated adaptive gaps in the literature and our sample ( $FSIQ \beta = 0.25-0.38$  for Global Adaptive Composite).

**Conclusions.** Meta-analytic effect sizes are clinically meaningful only when delivered at  $\geq 20$  h/week before age 9. Expressive-language weakness and widening age-related gaps in multicultural settings require integrated Naturalistic Developmental Behavioural Interventions with augmentative-communication components, plus sustained DLS coaching across development.

**Keywords:** autism spectrum disorder; adaptive behavior; meta-analysis; Vineland-3; multicultural

## Abbreviations

ABC = Adaptive Behavior Composite; ASD = Autism Spectrum Disorder; DLS = Daily-Living Skills; NDBI = Naturalistic Developmental Behavioural Intervention; SSMD = Standardized Summary Mean Difference.

## Introduction

Adaptive behavior—the composite of conceptual, social, and practical competences that underpin everyday independence—remains the decisive predictor of long-term quality of life in autism spectrum disorder (ASD). Yet published intervention trials often enroll homogeneous, English-speaking samples, while multicultural clinics encounter clients with markedly different linguistic, socio-economic, and cultural profiles. This highlights the crucial need for culturally adaptable interventions in autism research and intervention.

Recent meta-analyses have quantified medium gains in social/communication domains ( $g \approx 0.46$ – $0.63$ ) following intensive early-intervention or motor-activity programs, albeit with age and dosage acting as moderators. Simultaneously, new observational studies emphasize intelligence and autistic-symptom severity as significant determinants of adaptive functioning.

To bridge the bench-to-clinic divide, we contrasted those meta-analytic benchmarks with a real-world, linguistically diverse cohort evaluated via the Vineland-3 Comprehensive Interview Form. Our objectives were to (a) map where evidence-based effect sizes address the most significant clinical deficits, (b) clarify moderators (age, IQ, symptom severity) across both literatures, and (c) derive stage-specific, culturally adaptable treatment recommendations.

## Materials and Methods

### *Meta-analytic corpus*

A targeted appraisal identified eight systematic reviews (2021–2025) that (i) included at least five randomized or controlled trials, (ii) reported standardized effect sizes on Vineland or equivalent adaptive-behavior outcomes, and (iii) provided moderator analyses. The flagship review on motor interventions encompassed 23 RCTs ( $n = 636$ ) with a pooled SSMD of 0.41 across social, communication, and cognitive outcomes.

### *Clinical Cohort*

Henry A. Montero's retrospective chart review captured 16 consecutive Vineland-3 assessments (January 2023–April 2025). Participants (12 male, four female) spanned one year 10 months to 27 years (median = 8 years 4 months); 75 % were monolingual Spanish speakers or bilingual Spanish-English. Standard-score domains and v-scale subdomains were abstracted; all identifiers were removed per the IRB-exempt protocol.

### *Comparative metrics*

For each adaptive domain we calculated (i) mean baseline deficit in the clinical cohort, (ii) corresponding meta-analytic pooled effect size, and (iii) “coverage ratio” = effect size  $\div$  baseline SD gap. Moderator findings (age, IQ, repetitive behaviors) were extracted verbatim from the literature and cross-tabulated with cohort regressions (Spearman  $\rho$  or  $\beta$  coefficients).

## Results and Discussion

### *Communication: the most significant deficit meets the most significant pooled gain*

The cohort's Communication mean 54 reflects a 1.5 SD lag; expressive-language v-scales trailed receptive by 7.3 points. Meta-analytic naturalistic interventions reported  $g = 0.63$  for Communication, achieving a 42 % coverage ratio ( $0.63/1.50$ ). However, dosage emerged as critical: trials delivering <10 h/week yielded negligible change, while >20 h/week achieved near-normative gains. Therefore, culturally responsive coaching—translating scripts and leveraging bilingual family routines—is essential for Spanish-dominant households.

### ***Daily-Living Skills: “relative strength” yet still impaired***

Clinical DLS averaged 62.8, the highest within-profile domain yet 2.5 SDs below norms. Meta-analytic motor-leveraged interventions produced  $g = 0.49$  for DLS-proximal outcomes, a modest 20 % coverage ratio. Early adolescent programs like Surviving & Thriving in the Real World—showing Vineland DLS gains of 2.3 years in pilot work—appear necessary to close residual gaps.

### ***Socialization: age-sensitive trajectory***

Socialization scores fell from 90 (preschoolers) to 57 (adolescents/adults). Meta-analytic social-communication SSMD = 0.47, but effectiveness deteriorated 0.29 SD per year past age nine y. Our cohort’s cross-sectional slope (-4 Vineland points per year) mirrors this finding, underscoring the urgency of early enrollment.

### ***Intelligence and symptom severity as shared moderators***

The school-aged meta-analysis highlighted FSIQ as the most potent positive predictor ( $\beta = 0.25\text{--}0.38$ ) and repetitive behaviors (RRB) as negative predictors of adaptive functioning. The same patterns held in our cohort: FSIQ explained 31 % of ABC variance, while elevated RRB correlated with maladaptive v-scales  $\geq 18$  in 38 % of participants. Such concordance validates the cross-cultural generalizability of these moderators.

### ***Motor interventions: transfer to social-communication, not motor scores***

Surprisingly, the meta-analysis found motor programs improved social/communication domains ( $g \approx 0.45$ ) more than motor scores themselves ( $g = 0.22$ ,  $p = .18$ ). Our Vineland cohort mirrored this paradox: Motor SS (where available) averaged 65, higher than Communication but unaffected by prior gross-motor therapy. This suggests motor activities may catalyze social-communication mechanisms (joint attention, imitation) rather than purely enhancing coordination.

### ***Clinical synthesis***

Figure 1 (editable) plots baseline Vineland deficits against meta-analytic gains, illustrating domain-specific coverage. Combined evidence supports a tiered pathway:

1. **Early childhood ( $\leq 5$  y):** Naturalistic Developmental Behavioural Intervention integrated with aided AAC.
2. **Middle childhood (6–12 y):** Hybrid speech–language therapy plus task-analyzed DLS curricula.
3. **Adolescence/adulthood ( $\geq 13$  y):** STRW or equivalent DLS intensives, with Positive Behavior Support for maladaptive risk.

### **Conclusion**

Meta-analytic benchmarks promise clinically meaningful improvements in adaptive behavior, yet only when aligned with the developmental stage, intensity, and cultural context observed in everyday practice. Expressive-language weakness remains the cardinal deficit across both literatures; interventions must therefore weave high-dosage, bilingual language opportunities into daily routines. Age-related declines call for front-loading services before age nine. Finally, intelligence and repetitive behaviors consistently moderate outcomes, arguing for personalized adaptive-skill trajectories rather than one-size-fits-all models.

### **Conflict of Interest**

The author declares no potential conflicts of interest concerning this article’s research, authorship, and publication.

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