



ORIGINAL RESEARCH PAPER

Psychiatry

DOMAIN-SPECIFIC ASSESSMENT OF ADAPTIVE BEHAVIOR IN CHILDREN USING VINELAND SOCIAL MATURITY SCALE: A CROSS-SECTIONAL STUDY

KEY WORDS: Vineland Social Maturity Scale, adaptive behavior, children, neurodevelopmental disorders, epilepsy, rehabilitation

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ABSTRACT

Background: Adaptive behavior assessment is essential for understanding functional abilities in children with neurodevelopmental challenges. The Vineland Social Maturity Scale (VSMS) evaluates multiple domains of daily living skills, yet domain-specific patterns remain underexplored in clinical practice. **Objective:** To quantify domain-wise adaptive behavior profiles and examine associations with age, sex, and seizure status in children referred for neuropsychiatric evaluation. **Methods:** This retrospective cross-sectional study analyzed VSMS data from 50 children aged 1-15 years (mean age 10.82 ± 3.15 years) referred to a tertiary care center. Eight VSMS domains were assessed: Self-Help Dressing (SHD), Self-Direction (SD), Socialization (SOC), Occupation (OCC), Self-Help Gross Motor (SHG), Communication (COM), Self-Help Eating (SHE), and Locomotion (LOC). Descriptive statistics and subgroup comparisons were performed by age, sex, and seizure status. **Results:** The sample comprised 31 males (62%) and 19 females (38%), with 40 children (80%) having seizure history. Domain-specific difficulties varied significantly. Self-Help Dressing showed highest prevalence (74%, mean difficulty 2.51 ± 2.49), followed by Socialization (66%, 2.30 ± 1.96) and Occupation (66%, 2.48 ± 2.50). Age-related patterns revealed increasing difficulties in Occupation and Socialization domains among older children. Males showed greater difficulties in Self-Direction and Occupation, while females demonstrated more challenges in motor domains. Children with seizures exhibited significantly higher difficulty scores across all domains. **Conclusions:** Domain-specific VSMS assessment reveals distinct adaptive behavior profiles varying by age, sex, and seizure status. These findings support personalized rehabilitation planning and targeted interventions based on individual domain weaknesses.

INTRODUCTION

Adaptive behavior encompasses the collection of conceptual, social, and practical skills that individuals learn and perform in their daily lives. Assessment of adaptive functioning is critical in pediatric neuropsychiatry for diagnosis, treatment planning, and monitoring outcomes in children with neurodevelopmental disorders. The Vineland Social Maturity Scale (VSMS) has been a preferred assessment tool for measuring adaptive behaviors for over 85 years, particularly in Indian clinical settings.

The VSMS evaluates eight distinct domains of adaptive functioning: self-help skills (dressing, eating, gross motor activities), behavioral skills (communication, locomotion, socialization), and executive skills (self-direction, occupation). While total VSMS scores provide an overall index of social maturity, domain-specific analysis offers actionable clinical insights that inform targeted rehabilitation strategies.

Several factors influence adaptive behavior development in children, including chronological age, cognitive functioning, neurological conditions, and environmental factors. Epilepsy, in particular, has been associated with adaptive behavior deficits independent of intellectual disability, affecting functional outcomes across multiple domains. Despite widespread use of VSMS in clinical practice, limited research has systematically examined domain-specific patterns of adaptive behavior in Indian children, particularly those with neuropsychiatric conditions.

Study Rationale and Objectives

The current study addresses this gap by conducting a comprehensive domain-level analysis of VSMS data from children referred for EEG. The specific objectives were:

1. To quantify the prevalence and severity of difficulties across eight VSMS domains
2. To examine age-related patterns in domain-specific adaptive behavior
3. To identify sex differences in adaptive behavior profiles

4. To evaluate the association between seizure status and domain-specific adaptive functioning
5. To generate clinical recommendations for personalized rehabilitation planning based on domain profiles

Methods

Study Design and Setting

This retrospective cross-sectional study analyzed VSMS assessment data from children referred for EEG at a tertiary care center.

Participants

The study included 50 children aged 1-15 years who underwent VSMS assessment. All children were referred for evaluation due to behavioral issues, or epilepsy management. Inclusion criteria comprised: (1) age 1-15 years, (2) completed VSMS assessment, (3) no other comorbidity

Assessment Instrument

The Vineland Social Maturity Scale (Malin's Indian adaptation) was used to assess adaptive behavior. The VSMS consists of 89 items organized into eight domains:

Self-Help Skills: Self-Help Dressing (SHD), Self-Help Eating (SHE), Self-Help Gross Motor (SHG)

Behavioral Skills: Communication (COM), Locomotion (LOC), Socialization (SOC)

Executive Skills: Self-Direction (SD), Occupation (OCC)

The scale was administered through structured interviews with primary caregivers who were most familiar with the child's daily functioning.

Data Collection and Analysis

Demographic variables collected included age, sex, handedness, and seizure history. Domain-specific difficulty scores were recorded for each of the eight VSMS domains, with higher scores indicating greater difficulties. Descriptive statistics were calculated for demographic characteristics

and domain-specific scores. Mean difficulty scores with standard deviations were computed for each subgroup.

RESULTS

Sample Characteristics

The final sample comprised 50 children with a mean age of 10.82 ± 3.15 years (range: 1-15 years). Age distribution showed 2% in the 1-5 years group, 38% in the 6-10 years group, and 60% in the 11-15 years group. The sample included 31 males (62%) and 19 females (38%), with 92% right-handed. Notably, 40 children (80%) had a documented history of seizures, reflecting the high proportion of neurological conditions in this clinical sample (Table 1).

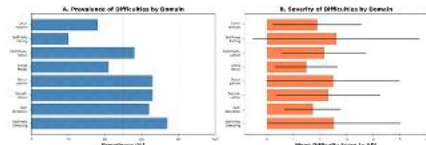
Table 1. Sample Characteristics

Characteristic	Value
Total sample size, n	50
Age (years), mean ± SD	10.82 ± 3.15
Age range (years)	1.0 - 15.0
Age distribution:	
1-5 years, n (%)	1 (2.0%)
6-10 years, n (%)	19 (38.0%)
11-15 years, n (%)	30 (60.0%)
Sex distribution:	
Male, n (%)	31 (62.0%)
Female, n (%)	19 (38.0%)
Handedness:	
Right-handed, n (%)	46 (92.0%)
Left-handed, n (%)	4 (8.0%)
Seizure status:	
With seizures, n (%)	40 (80.0%)
Without seizures, n (%)	10 (20.0%)

Domain-Specific Adaptive Behavior Profiles

Domain-specific analysis revealed varying prevalence of difficulties across VSMS domains. Self-Help Dressing (SHD) showed the highest prevalence, with 74% of children demonstrating measurable difficulties (mean difficulty score 2.51 ± 2.49). Socialization (SOC) and Occupation (OCC) domains each affected 66% of children, with mean difficulty scores of 2.30 ± 1.96 and 2.48 ± 2.50, respectively (Figure 1, Table 2).

Figure 1. Domain Prevalence and Severity



Panel A shows the prevalence of difficulties across eight VSMS domains. Panel B illustrates the mean difficulty scores with standard deviations for each domain.

Table 2. Domain-Specific Prevalence and Severity

VSMS Domain	N with difficulties	Prevalence (%)	Mean ± SD
Self-Help Dressing	37	74.0	2.51 ± 2.49
Self-Direction	32	64.0	1.72 ± 1.05
Socialization	33	66.0	2.30 ± 1.96
Occupation	33	66.0	2.48 ± 2.50
Self-Help Gross Motor	21	42.0	1.48 ± 1.17
Communication	28	56.0	2.14 ± 1.58
Self-Help Eating	10	20.0	2.60 ± 3.13
Locomotion	18	36.0	1.89 ± 1.68

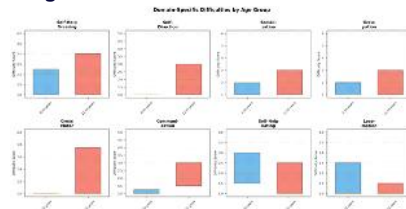
Self-Direction (SD) difficulties were present in 64% of children, while Communication (COM) challenges affected 56%. Gross motor skills (SHG) and Locomotion (LOC) showed lower prevalence at 42% and 36%, respectively, suggesting

relative preservation of motor functions. Self-Help Eating (SHE) had the lowest prevalence (20%), though affected children showed substantial difficulties.

Age-Related Patterns in Adaptive Behavior

Domain-specific analysis by age group revealed distinct developmental patterns. For Self-Help Dressing, mean difficulty scores increased from 2.25 in the 6-10 years group to 2.71 in the 11-15 years group. Self-Direction showed a similar increasing pattern, with means of 1.15 and 2.11 respectively. Notably, Occupation domain difficulties increased markedly with age, from 1.80 in middle childhood to 2.78 in adolescence, reflecting the expanding academic and vocational demands of later development (Figure 2).

Figure 2. Age-Related Patterns Across VSMS Domains

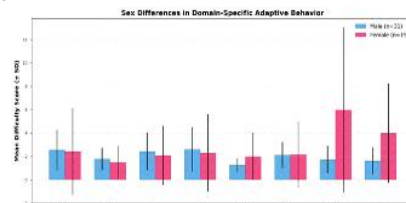


Box plots showing distribution of difficulty scores for each domain by age group (6-10 years vs 11-15 years). Boxes represent interquartile range, horizontal lines show medians, and means are indicated by dashed lines.

Sex Differences in Adaptive Behavior Domains

Analysis by sex revealed domain-specific patterns. Males (n=31) demonstrated higher mean difficulty scores in Self-Direction (1.79 vs. 1.50) and Occupation (2.60 vs. 2.31), suggesting greater challenges with task initiation, planning, and academic/vocational activities. Females (n=19) showed higher difficulty scores in Self-Help Gross Motor (2.00 vs. 1.27), Self-Help Eating (6.00 vs. 1.75), and Locomotion (4.00 vs. 1.62). Communication difficulties were comparable between sexes (males 2.14, females 2.17), as were Socialization challenges (males 2.43, females 2.08) (Figure 3, Table 3).

Figure 3. Sex Differences in Domain-Specific Adaptive Behavior



Grouped bar chart comparing mean difficulty scores between males (n=31) and females (n=19) across all eight VSMS domains. Error bars represent ± 1 standard deviation.

Table 3. Sex Differences in Domain-Specific Difficulties

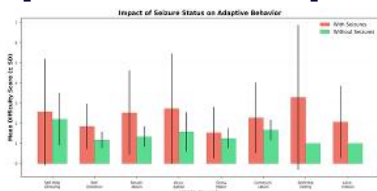
VSMS Domain	Male (n=31)	Female (n=19)	Difference
Self-Help Dressing	2.56 ± 1.73	2.42 ± 3.70	0.14
Self-Direction	1.79 ± 0.93	1.50 ± 1.41	0.29
Socialization	2.43 ± 1.60	2.08 ± 2.54	0.35
Occupation	2.60 ± 1.90	2.31 ± 3.30	0.29
Self-Help Gross Motor	1.27 ± 0.59	2.00 ± 2.00	-0.73
Communication	2.14 ± 1.13	2.17 ± 2.86	-0.03
Self-Help Eating	1.75 ± 1.16	6.00 ± 7.07	-4.25
Locomotion	1.62 ± 1.15	4.00 ± 4.24	-2.38

Note: Positive differences indicate higher difficulties in males; negative differences indicate higher difficulties in females.

Seizure Status and Adaptive Behavior

Children with seizure history (n=40) demonstrated higher mean difficulty scores across all VSMS domains compared to those without seizures (n=10). The differences were most pronounced in Socialization (2.52 vs. 1.33, difference +1.19), Occupation (2.73 vs. 1.57, difference +1.16), and Self-Help Eating (3.29 vs. 1.00, difference +2.29). Self-Direction difficulties were also elevated in children with seizures (1.85 vs. 1.17, difference +0.68). These findings indicate that epilepsy impacts adaptive functioning beyond basic motor and cognitive abilities, affecting higher-order social and occupational domains critical for functional independence (Figure 4, Table 4).

Figure 4. Impact of Seizure Status on Adaptive Behavior



Comparison of mean difficulty scores between children with seizures (n=40) and without seizures (n=10) across all VSMS domains. Error bars represent ± 1 standard deviation.

Table 4. Domain-Specific Difficulties by Seizure Status

VSMS Domain	With Seizures (n=40)	Without Seizures (n=10)	Difference
Self-Help Dressing	2.56 ± 2.64	2.20 ± 1.30	0.36
Self-Direction	1.85 ± 1.12	1.17 ± 0.41	0.68
Socialization	2.52 ± 2.10	1.33 ± 0.52	1.19
Occupation	2.73 ± 2.74	1.57 ± 0.98	1.16
Self-Help Gross Motor	1.53 ± 1.28	1.25 ± 0.50	0.28
Communication	2.27 ± 1.75	1.67 ± 0.52	0.61
Self-Help Eating	3.29 ± 3.59	1.00 ± 0.00	2.29
Locomotion	2.07 ± 1.79	1.00 ± 0.00	1.07

Note: All values represent mean difficulty scores ± standard deviation. Positive difference indicates higher difficulties in children with seizures.

DISCUSSION

This domain-specific analysis of VSMS data from 50 children reveals distinct adaptive behavior profiles that vary systematically by age, sex, and seizure status. The findings suggests that total VSMS scores alone may obscure clinically significant patterns of strength and weakness that inform targeted intervention planning.

Self-Help Dressing emerged as the most frequently affected domain (74% prevalence), suggesting that fine motor coordination, sequencing abilities, and independence in personal care represent common challenges in children referred for eeg. Occupational therapy focusing on adaptive equipment, task breakdown strategies, and motor skill development would be indicated for these children.

The high prevalence of Socialization (66%) and Occupation (66%) difficulties aligns with the neurodevelopmental nature of the referral population. Socialization deficits may reflect underlying social cognition impairments, communication difficulties, or behavioral regulation challenges requiring behavioral therapy, social skills training, and peer interaction programs. Occupation domain difficulties, particularly prominent in older children, highlight the need for academic accommodations, vocational assessment, and executive function support.

The increasing difficulty scores in Socialization, Occupation,

and Communication domains with advancing age reflect the expanding environmental demands placed on older children and adolescents. While younger children require mastery of basic self-care and motor skills, adolescents face complex social hierarchies, abstract academic content, and vocational expectations that challenge adaptive functioning. Early intervention targeting foundational skills in younger children may prevent cascade effects on later social and occupational functioning.

Clinical Implications

The domain-specific profiles identified in this study support a shift from global VSMS scores to individualized intervention planning based on specific patterns of strength and weakness. For example, a child with preserved motor skills but significant Socialization and Communication deficits would benefit from speech-language therapy and social skills groups. Conversely, a child with Occupation domain difficulties but intact social skills requires academic accommodations and executive function coaching.

This precision approach to rehabilitation planning maximizes intervention efficiency, reduces caregiver burden, and improves long-term functional outcomes by targeting resources toward areas of greatest need.

Future Directions

Future prospective studies with larger samples, complete domain coverage, and formal hypothesis testing are needed to confirm these preliminary findings. Longitudinal designs tracking domain-specific trajectories would clarify developmental patterns and identify critical periods for intervention. Examination of associations between domain-specific profiles and specific neurodevelopmental diagnoses would enhance diagnostic precision.

CONCLUSIONS

This domain-specific analysis reveals that children referred for eeg demonstrate heterogeneous profiles of adaptive behavior strengths and weaknesses that vary systematically by age, sex, and seizure status. Self-Help Dressing, Socialization, and Occupation domains are most frequently affected, while motor domains show relative preservation. Older children face increasing difficulties in Socialization and Occupation reflecting expanding environmental demands. Males show greater Executive and Occupational challenges, while females demonstrate more motor difficulties. Children with seizures exhibit pervasive adaptive behavior deficits across domains.

These findings support a paradigm shift from total VSMS scores to domain-specific assessment profiles that inform personalized, precision-based rehabilitation planning. Domain-centric VSMS evaluation moves beyond disability labels toward functional profiling, enabling measurable rehabilitation goals and outcome monitoring. This approach has particular value in Indian clinical settings where VSMS is widely used but domain-level analysis remains underutilized. Implementation of domain-specific assessment protocols in routine clinical practice would enhance the utility of VSMS for both diagnostic formulation and treatment planning, ultimately improving adaptive functioning and quality of life for children.

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