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Table 47. Vineland-3 Daily Living Skills Domain – Manual Categories

		Interview Form					
		High	Moderately High	Adequate	Moderately Low	Low	Total
Parent/Caregiver Form	High	0	0	0	0	0	0
	Moderately High	0	0	0	0	0	0
	Adequate	0	0	3	6	0	9
	Moderately Low	0	0	4	12	8	24
	Low	0	0	1	3	15	19
	Total	0	0	8	21	23	52

Note. 58% = Consistent Categories; 15% = Inconsistent Categories - Lower level of functioning according to Parent/Caregiver Form; 27% = Inconsistent Categories - Lower level of functioning according to Interview.

Table 48. Vineland-3 Socialization Domain – Manual Categories

		Interview Form					
		High	Moderately High	Adequate	Moderately Low	Low	Total
Parent/Caregiver Form	High	0	0	0	0	0	0
	Moderately High	0	0	0	0	0	0
	Adequate	0	0	3	2	0	5
	Moderately Low	0	0	2	9	12	23
	Low	0	0	0	6	18	24
	Total	0	0	5	17	30	52

Note. 58% = Consistent Categories; 15% = Inconsistent Categories - Lower level of functioning according to Parent/Caregiver Form; 27% = Inconsistent Categories - Lower level of functioning according to Interview.

Table 52. Vineland-3 Daily Living Skills Domain – NDIA Categories

		Interview Form					
		Above 1.49 *SD* Below	1.50-1.99 *SD* Below	2.00-2.49 *SD* Below	2.50-2.99 *SD* Below	3 *SD* Below or Less	Total
Parent/Caregiver Form	Above 1.49 *SD* Below	14	7	2	0	0	23
	1.50-1.99 *SD* Below	3	1	6	0	0	10
	2.00-2.49 *SD* Below	1	3	4	1	3	12
	2.50-2.99 *SD* Below	0	0	2	2	0	4
	3 *SD* Below or Less	0	0	0	1	2	3
	Total	18	11	14	4	5	52

Note. 44% = Consistent Categories; 19% = Inconsistent Categories - Lower level of functioning according to Parent/Caregiver Form; 37% = Inconsistent Categories - Lower level of functioning according to Interview.

Table 53. Vineland-3 Socialization Domain – NDIA Categories

		Interview Form					
		Above 1.49 *SD* Below	1.50-1.99 *SD* Below	2.00-2.49 *SD* Below	2.50-2.99 *SD* Below	3 *SD* Below or Less	Total
Parent/Caregiver Form	Above 1.49 *SD* Below	8	4	5	0	0	17
	1.50-1.99 *SD* Below	2	2	1	3	3	11
	2.00-2.49 *SD* Below	2	3	1	1	3	10
	2.50-2.99 *SD* Below	0	1	1	0	6	8
	3 *SD* Below or Less	0	0	1	2	3	6
	Total	12	10	9	6	15	52

Note. 27% = Consistent Categories; 23% = Inconsistent Categories - Lower level of functioning according to Parent/Caregiver Form; 50% = Inconsistent Categories - Lower level of functioning according to Interview.

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Table 49. Vineland-3 Motor Domain – Manual Categories

		Interview Form					
		High	Moderately High	Adequate	Moderately Low	Low	Total
Parent/Caregiver Form	High	0	0	0	0	0	0
	Moderately High	0	0	0	0	0	0
	Adequate	0	0	7	1	0	8
	Moderately Low	0	0	3	15	5	23
	Low	0	0	0	0	0	0
	Total	0	0	10	16	5	31

Note. 71% = Consistent Categories; 10% = Inconsistent Categories - Lower level of functioning according to Parent/Caregiver Form; 19% = Inconsistent Categories - Lower level of functioning according to Interview.

Table 54. Vineland-3 Motor Domain – NDIA Categories

		Interview Form					
		Above 1.49 *SD* Below	1.50-1.99 *SD* Below	2.00-2.49 *SD* Below	2.50-2.99 *SD* Below	3 *SD* Below or Less	Total
Parent/Caregiver Form	Above 1.49 *SD* Below	13	6	0	0	0	19
	1.50-1.99 *SD* Below	4	3	2	1	2	12
	2.00-2.49 *SD* Below	0	0	0	0	0	0
	2.50-2.99 *SD* Below	0	0	0	0	0	0
	3 *SD* Below or Less	0	0	0	0	0	0
	Total	17	9	2	1	2	31

Note. 52% = Consistent Categories; 13% = Inconsistent Categories - Lower level of functioning according to Parent/Caregiver Form; 35% = Inconsistent Categories - Lower level of functioning according to Interview.

Table 55. Classification Comparison between Vineland-3 Maladaptive Behavior (Internalizing) Domain *Parent/Caregiver* and *Interview Forms* (Manual Categories) for the Full NDC Sample

		Interview Form			
		Average	Elevated	Clinically Significant	Total
Parent/ Caregiver Form	Average	0	1	0	1
	Elevated	0	12	10	22
	Clinically Significant	0	0	28	28
	Total	0	13	38	51

Note. 78% = Consistent Categories; 0% = Inconsistent Categories - More concerns according to *Parent/Caregiver* Form; 22% = Inconsistent Categories - More concerns according to Interview.

Table 56. Classification Comparison between Vineland-3 Maladaptive behavior (Externalizing) Domain *Parent/Caregiver* and *Interview Forms* (Manual Categories) for the Full NDC Sample

		Interview Form			
		Average	Elevated	Clinically Significant	Total
Parent/ Caregiver Form	Average	8	1	0	9
	Elevated	2	16	12	30
	Clinically Significant	0	2	10	12
	Total	10	19	22	51

Note. 67% = Consistent Categories; 8% = Inconsistent Categories - More concerns according to *Parent/Caregiver* Form; 25% = Inconsistent Categories - More concerns according to Interview.

Test-Retest Reliability

Objective: Determine the test-retest reliability of the Vineland-3 *Parent/Caregiver Form*.

Test-retest reliability is a type of reliability associated with the consistency of measurement during repeated administration of the same assessment where the testing conditions remain as constant as possible (Portney & Watkins, 2009). Intraclass correlation coefficients (ICC) were calculated to compare Vineland-3 composite and domain scores between Assessment 1 and Assessment 2a. ICC estimates were based on single-measures (type), absolute-agreement (definition) and a two-way mixed effects model (Koo & Li, 2016). The magnitude of the ICC is described according to the following categories, where the lower bound CI is referenced as the beginning range of the reliability (Koo & Li, 2016):

- Below .50 = poor (pink)
- Between .50 to .75 = moderate (orange)
- Between .75 to .90 = good (light green)
- Above .90 = excellent (dark green).

For the Vineland-3 *Parent/Caregiver Form*, ICCs were calculated using 38-57 completed assessments for comparisons with Assessment 2a. Results showed ICC values ranging from .72 to .95, and lower bound CIs commencing at .56, indicating moderate to excellent test-retest reliability for the included composite and domain scores (Table 57).

Table 57. Test-Retest Reliability (ICC) for Vineland-3 *Parent/Caregiver Form* between Assessment 1 and 2 for the Full NDC Sample

Domain	ICC	*n*	Lower Bound	Upper Bound	F Value
Adaptive Behavior Composite	0.93 **	57	0.88	0.96	26.24
Communication	0.85 **	57	0.76	0.91	11.99
Daily Living Skills	0.95 **	57	0.91	0.97	38.41
Socialization	0.87 **	57	0.79	0.92	14.63
Motor Skills	0.88 **	38	0.79	0.94	16.14
Maladaptive Behavior (Internalizing)	0.72 **	50	0.56	0.83	6.18
Maladaptive Behavior (Externalizing)	0.86 **	50	0.77	0.92	13.52

**Correlation is significant at the 0.01 level (2-tailed).
Note. Between .50 to .75 = moderate (orange); Between .75 to .90 = good (light green); Above .90 = excellent (dark green).

Inter-Rater Reliability

Objective: Determine the inter-rater reliability of the Vineland-3 *Interview Form*.

Inter-rater reliability refers to the extent of variability when two or more assessors complete ratings for an assessment of the same group of individuals (Portney & Watkins, 2009). Inter-rater reliability was calculated for the Vineland-3 *Interview Form*. Percentage agreement rates and weighted kappa statistics were calculated to compare ratings by the original assessor who administered the assessment, and a second assessor who scored a random selection of cases based on an audio recording of the original administration. The statistical program R was used to calculate composite and domain level weighted kappa statistics (a chance-corrected measure of agreement using a quadratic incremental weighting system) and percentage agreement rates (Portney & Watkins, 2009). The magnitude of the weighted kappa statistic is described according to the following categories (Cicchetti, 1994):

- Below .40 = poor (pink)
- Between .40 to .759 = fair (orange)
- Between .60 to .74 = good (light green)
- Above .75 = excellent (dark green).

One of the chief investigators (KE) prepared a rating file for each case, where the specific items rated by the first assessor were listed in a Microsoft Excel spreadsheet, with one sub-domain per sheet. These items were retrieved from the Intervention Guidance Section of the Comprehensive Report (basal and ceiling items not administered were removed). At the same time, the chief investigator prepared a corresponding data analysis worksheet that included both the items and first assessor's scores. The second assessor returned their rating files to the chief investigator, and these were added to the corresponding data analysis worksheet. Composite and domain level weighted kappa statistics and percentage agreement rates were calculated.

For the Vineland-3 *Interview Form*, percentage agreement rates and weighted kappa statistics were calculated using 20 completed assessments from Assessment 2b. Results showed weighted kappa statistics ranging from .76 to .97 and percentage agreement rates ranging from 76% to 97%, indicating moderate to excellent inter-rater reliability for assessment scoring for the included domains and subdomains (Table 58). Please note that this inter-rater reliability finding is restricted to consistency in scoring the assessment items presented, as it was not possible to measure consistency in assessment administration.

Table 58. Inter-Rater Reliability (Weighted Kappa) for Vineland-3 *Interview Form* for the Full NDC Sample

	Number of Items	Weighted Kappa	Overall Agreement
Adaptive Behavior Composite	3031	0.81	80%
Communication	941	0.84	84%
Daily Living Skills	953	0.81	81%
Socialization	1137	0.76	76%
Motor Skills	380	0.86	86%
Maladaptive Behavior	565	0.97	97%

Note. Between .60 to .79 = moderate (orange); between .80 to .90 = strong (light green); Above .90 = almost perfect (dark green).

Usability

Applicability

Objective: Determine the applicability of the Vineland-3 *Parent/Caregiver Form* and Vineland-3 *Interview Form* in determining impairment level.

Applicability within this project is defined as the capacity for an assessment tool to determine an individual's impairment level. This was evaluated through calculating the proportion of cases that are below a series of thresholds, as defined by the manual and NDIA categories outlined in the Assessment Tools section.

When the Vineland-3 *Parent/Caregiver* and *Interview Form*s mean composite and domain scores were examined for Assessments 1 and 2b, all domains were considered moderately low or low, and almost all of the maladaptive responses were elevated or clinically significant (Table 59; Sparrow et al., 2016). Almost all cases had at least one Vineland-3 composite or domain score in the 'moderately low' range, and 61–84% of cases had at least one Vineland-3 composite or domain score in the 'low' range, with the greater proportion when using the *Interview Form* (Table 59).

Table 59. Number and Proportion of Participants that Meet Criteria of at Least One Domain Score Rated at or Below Each Threshold of *SD*s Below the Mean for the Vineland-3 for the Full NDC Sample

Threshold	**Vineland-3 *Parent/Caregiver Form* (Assessment 1)** *n*	**Vineland-3 *Interview Form* (Assessment 2b)** *n*
Total sample	130	80
1 *SD* below mean	126 (97%)	80 (100%)
1.5 *SD* below mean	106 (82%)	74 (92%)
2 *SD* below mean	79 (61%)	67 (84%)
2.5 *SD* below mean	45 (35%)	55 (69%)
3 *SD* below mean	24 (18%)	39 (49%)

Caregiver Acceptability

Objective: Investigate the acceptability of the Vineland-3 to caregivers.

Response to Reviewing Vineland-3 Results

A total of 46 caregivers provided their thoughts upon hearing the results when they received the report. Two general themes of 'Meeting Expectations' and 'Helpfulness' emerged, comprising of both positive and negative responses.

Meeting Expectations

The majority of respondents (*n* = 37) reported that the results of the Vineland-3 provided a depiction of their child's functioning related to both strengths and challenges consistent with their expectations. For example, caregivers stated: "not very surprising", "this was fine", "about what I expected", "I agree with the results", "sounds realistic to me" and "nothing I didn't already know". One respondent reported the results aligned with previous Vineland-3 assessments conducted: "Results were what I expected to see. He has done other Vinelands before and the results were similar to the results from this one as well." A much smaller number of caregivers (*n* = 6) reported that the results from some domains surprised them, with four caregivers commenting that the results were lower than expected and two stating that the results rated their child's functioning higher than expected. One caregiver highlighted the scoring system (in which non-compliance is rated as a 0) as a possible explanation for the lower than expected results: "Mobility [domain] lower than expected. Main barrier is that he refuses to do, rather than can't."

Helpfulness

Two caregiver responses highlighted ways in which the results were helpful for them. One caregiver commented that seeing their child's level of functioning without supports in place was helpful. The other stated that the results would be "good to pass onto therapists and teachers in the future".

Six caregivers provided feedback that the results were not helpful; one commented that the findings didn't provide any new information while the other caregivers stated that the results weren't easily understood. For example: "Wasn't really sure what it [the results] meant. I thought there might be more useful information for me as a parent." Specifically, caregivers commented that the reporting of the scores did not come with adequate explanation and interpretation. According to one caregiver, "The percentile rank seems bizarre. I find that percentiles are

confusing. Prefer results for comparison presented in a graph form. The rest is numbers on a page." Another provided a suggestion on how to make the results more useful: "I feel an explanation of the 5 result columns is needed with this information, as it is assumed the reader knows that these things mean and stand for."

Accuracy

A total of 55 caregivers responded to this question, with the vast majority (*n* = 44) expressing that they felt the Vineland-3 had some degree of accuracy in measuring their child's actual challenges and abilities in everyday life, as captured in the following quotes:

- "It's very detailed so it should be accurate if parent answers truthfully."
- "[The Vineland-3] was better than the PEDI-CAT. [It] captured him a lot more accurately, it talked more into socialisation and his particular challenges."
- "Results match with his strengths and weaknesses; identified what we already knew needed to be worked on."
- "More accurate than other assessments parent has completed - covered a lot more about the child's unique situation. Included day to day struggles."

Some caregivers felt that the Vineland-3 was more accurate than the PEDI-CAT (ASD) in identifying their child's needs as it measured what their child could do independently, without supports in place: "It's done really well in showing that without supports he's not doing that well."

Seven respondents believed the Vineland-3 did not accurately measure their child's functioning. In general, they felt this was because the assessment was "too generalised", there were too few response options to adequately discern abilities and it did "not address strengths ". In addition, the Vineland-3 did not capture fluctuations in functioning across time and environmental contexts. The consequence was that the results were not "truly reflective of everyday life" and "probably underestimating'' abilities .

Four caregivers reported feeling neutral about the accuracy of the Vineland- 3 in measuring everyday functioning. The reasons provided included inconsistency of results with some areas being perceived as more accurate than others, and not feeling qualified to comment as stated by one caregiver: "How do I know if this is accurate??".

Likes and Dislikes

Vineland-3		
	Likes	**Dislikes**
Administration	• Easy to complete • Computer-based (*Parent/Caregiver Form*) • Interview version – interactive, personalised, assessor can scaffold questions, can discuss responses to answer more accurately, no screen	• Length (although many responses indicated it was acceptable given the comprehensiveness of the tool) • Exhausting and hard to concentrate • Completing over the phone (no visuals) • Paper-version
Structure/format	• Layout – multiple questions on one page • Ability to write comments in response section • Response options – clear descriptions, accurate scoring, ability to score 'sometimes' and option to 'check if estimated' • Results easy to understand	• Repetitive • Too many sections • Response options – too few choices (need a 'seldom' option) and not sensitive enough. 'Never (0)' option covers too many reasons (e.g. unable, no opportunity, not expected, noncompliant) • Results not clear, no explanation provided
Content	• Comprehensive • Questions concise, straightforward, structured and easy to understand • Questions appropriate and relevant • Broken down into specific tasks/activities	• Questions too general and ambiguous (*Interview Form*) • No consideration of context and functioning across different environments • Does not capture strengths • Many questions not age appropriate or otherwise irrelevant

Comparison based on Research Stream

Qualitative responses were compared between caregivers who completed (1) the *Parent/Caregiver Form* only; (2) both the *Parent/Caregiver Form* and *Interview Form*; and (3) the *Interview Form* only. Caregivers' perceptions about the Vineland-3 regarding accuracy, ease of use and the likelihood of recommending for clinical use tended to be more positive for those who completed the *Interview Form* only. The main differences were explained with a preference "to talk to a person rather than looking at a screen", as "it was interactive and…more personal", they "liked that [they] could ask questions or…clarify things" and "explain [their] answers", whilst the assessor could

“scaffold…questions” and “unpick the...real difference between can and could”. In contrast, caregivers who completed both versions commented that “ a phone [call] was more challenging rather than visual (might be individual skills related)” and “I prefer the computer-based form. In one way it was good to explain to the person but in other ways it makes it drag on for too long when I talk about things a lot.”

Clinical Utility

Objective: Investigate the clinical utility of the Vineland-3 to clinicians.

Clinician feedback regarding the clinical utility of the Vineland-3 was mixed. Generally, they acknowledged that the Vineland-3 was an established and widely used assessment of functioning, however expressed concerns around the burden it places on caregivers and its ability to comprehensively capture functioning in a meaningful way when considering the support needs of individuals on the autism spectrum and their families.

	Likes	Dislikes
Appropriateness	• "Comprehensive", and "detailed" – "it asks really great questions actually about the breadth of adaptive skills and functional performance areas that we're interested in". • Maladaptive behavior domains are clinically useful – "it really helps to identify the difficulties that the parents are facing". • Able to select starting points (paper forms only) – "the clinician can say, 'Well, you start from here.'" • Choices available (e.g. form vs interview, parent/caregiver vs teacher, paper vs online) – "I like that you've got choice between the online version and the paper version, and you get the same sort of quality information from either... I think choice is always good ... differently resourced settings, as well as family choice." • Well established - "a long-standing tool that we've grown to trust". • Norms available – "then you're comparing to the population". • Considered accurate – "matching up with clinical impressions and other measures". • Content, instructions and scores (age equivalents) have improved with Vineland-3, along with the introduction of online	• Biases from caregiver report (playing system, limited exposure to normal development etc.) – "parents either grossly over-estimate, or under-estimate, what the child can do". • Doesn't take all contexts into consideration – "what the parents think they're doing isn't necessarily what they're doing everywhere". • "Floor effect" and "how appropriate all the questions are for younger children" (0-5-year-old) was an area of concern, although it has been improved in newest version – "it pretty quickly scales up to something, or a set of questions you would only ask older children". • Algorithms for online format results in not all questions asked – "a potential disadvantage is you're not getting to see everything, you're only getting what it spits out in an algorithm, because the kids have such scattered skills". • Online questions are not efficient – "it will give you all this information relating to that first overarching question, then …'Oh, but they didn't actually address any of the points I needed to score.'" • No motor domain for above 9 years.

	administration – "Vineland 3… they're much easier". • Uses include "screening", "determining functioning", "giving schools solutions to problems" and it also helps feel "confident with your diagnosis" and provides "something concrete to write the letters to [funding providers]". • If administered prior to the assessment, clinicians can review item level responses and "gives you a start" to focus further questions. • Can be helpful in getting early intervention – "at least [the report]'s clear … it can stop a lot of other wasted resources doing other things, and so we need to do a Vineland, or you need to do a PEDI-CAT". • Good age range (into older adulthood).	• Not from a strengths based perspective (considered to be more confronting / distressing than PEDI-CAT (ASD) due to greater deficit focus (e.g. scoring scale).
Accessibility	• Parent/caregiver Form can be done without clinician present – if "you send them away to do it" via paper forms on remote online administration. One clinician stated "we e-mail a link out to families and the reports come back, [we] download them and they sit inside the medical record, so they then [the team] have access to that." This fits with "in clinical practice I want to do the thing that's quickest". • Q-Global report generation is efficient – "it's pretty quick". • Some clinicians are using forms (previous version) to save money rather than best tool to use – "that's why we're using up old paper copies". • Pay per use allows clinicians to only pay for what they need – "even though the Vineland per test might end up being more expensive than the PEDI-CAT, your initial outlay's not as large, and you can cover costs per report by charging a report fee".	• Untenable administration time – "the length of it is onerous, absolutely … the appropriateness of it is affected". • Interview requires 1-2 hours of clinician time and was not feasible – "Would cost too much money to have this administered for each client/patient". • Parent/caregiver Form still needed clinician time for report/scoring (paper version) and follow-up "reminders of 'please return it'". • The purchase price per assessment was considered "expensive for a small practice or one which would not use this tool frequently", although purchasing online credits could overcome this in part. • The hidden and substantial cost of buying the manual was considered "a little bit dodgy", particularly as "working as part of an organisation, and having one copy of a manual is a nightmare" (noting that the paid PDF manual

	• Online scoring through Q global was also cost effective – "very cost-effective - $67 is quite a good price for a year. It's worth the money to not have to score it by hand, so worth the money." • Q global – "very easy to renew"/purchase credits and usually easy to order forms.	accessed through Q global cannot be printed). • Procurement was process difficult "because of all the options available. It was a little bit confusing when I got onto the website, about what to purchase and what would be best for my situation" and they "could easily over purchase". In addition, ""backorder has been happening a fair bit". • Some clinicians were unable to buy the assessments from Pearson – "as a medical practitioner, I wouldn't be able to access the Vineland. I don't have enough credentials".
Practicability	• Do not need to purchase anything else, as "you don't need the manual to score it" (automatic online). • Need upskilling before use – "basals and ceilings were really important to understand, and to be able to convey that to a family". • Pre-requisite knowledge / skills and training requirements similar to PEDI-CAT – especially "interview process, because it's long…how you're running your clinical interview" and "knowledge of what the scores mean". • Required to be administered by a "clinical profession" and possibly an "education professional".	• Completion time was not acceptable – "some parents found it very onerous and just weren't going to manage it" and "particularly a family that really considers their answers". • Restrictions on sharing the full report with caregivers was considered inappropriate and time consuming – "so there's another time requirement…now you have to re-interpret the whole thing, and re-write some sort of report, because you can't actually use the material that's been generated", although the acknowledged "see why they don't want you to give this to the parents, because [they] wouldn't understand it". • Item terminology can lead to "misunderstanding what the question was asking" – "a common mistake…I think it's just the way they read the questions, it's not always clear". This was particularly the case for some items – "if it's asking something that's crazy stuff for a four-year-old - to be going out at night, or taking their own medications, it wouldn't make sense for them". • Concerns were raised about the language used in the

		maladaptive behavior domain – "literally just reading them a list of horrible things...and it's right at the end as well, [so] you just end on a really sour note". • Concern regarding suitability for English as a second language parents – ""you've got the added layer of an interpreter, and if we were using the Vineland in our clinic we'd have to allocate a whole other session just to complete it, which isn't feasible in the model". • Newer formats rely on technology - "you definitely need a computer, and you need internet access". • This led to concerns that it would exclude families with a lower socioeconomic status – "E-mail is often a luxury. You've got to have money for data." • Parents may find completing the assessment and receiving the results "confronting" – "look at all these things they're not doing" and "how does the parent feel when he thinks that his child is one month old in terms of receptive language?" • Self-report version not available – "the 90-year-old…the likelihood of having their parent [available to complete a parent report version]" and when considering an adult with a disability "[she] would be appalled if she couldn't fill in her own questionnaire, and would actually find that really degrading".
Acceptability	• In conclusion, the clinicians felt that the Vineland-3 was "somewhat" to "very" acceptable to clients, clinicians and society.	

Discussion

Reliability for the Vineland-3 was evaluated in relation to internal consistency, alternate forms reliability, test-retest reliability and inter-rater reliability. **Internal consistency** coefficients were not calculable for the composite and domain scores due to many invalid cases resulting from the adaptive nature of the assessment. All but two sub-domains of the *Parent/Caregiver Form* (Communication – Written and Daily Living Skills – Community) had enough valid cases for analysis and were described as having good to excellent internal consistency, suggesting homogeneity of assessment items. The Internal consistency for the sub-domains of the *Interview Form* (except Communication – Written, which had too few valid cases) ranged from unacceptable to excellent. Results from the **alternate forms reliability** analyses revealed that, although the Vineland-3 *Parent/Caregiver* and *Interview Forms* had moderate to good correlation results, the Adaptive Behavior Composite and the Communication and Socialization domain scores were significantly lower when the *Interview Form* was administered. The Maladaptive Behavior domain scores were significantly lower in the *Parent/Caregiver Form,* indicating a lower level of clinical concern. This suggests that the *Interview Form* specifies a greater level of impairment and concern overall, likely a result of the administration format in which a trained health professional conducts an interview using broad open questions and probes to elicit relevant information using clinical judgement. Analysis of agreement in assigning manual and NDIS impairment categories revealed that the *Interview Form* assigned lower impairment / greater concern categories in 19-52% of cases, and the *Parent/Caregiver Form* classified 0-23% of cases to lower classifications of functioning / greater concerns. This confirms findings from statistical analysis that the *Interview Form* may specify a greater level of impairment or concern than the *Parent/Caregiver Form* for young people with NDCs. **Test-retest reliability** findings indicate that the Vineland-3 *Parent/Caregiver Form* shows moderate to excellent levels of test-retest reliability. **Inter-rater reliability** findings indicate that the Vineland-3 *Interview Form* shows moderate to excellent levels of inter-rater reliability.

Usability for the Vineland-3 was evaluated in relation to the applicability in determining impairment levels, caregiver acceptability and clinical utility. Findings in relation to **applicability** in determining impairment levels revealed that, when compared to the normative sample, most cases (61% for the *Parent/Caregiver Form* and 84% for the *Interview Form*) were classified as having 'low' functioning, based on the composite and/or at least one domain score being more than two standard deviations below the normative mean. A further 16% (*Interview Form*) to 36% (*Parent/Caregiver Form*) were classified as having 'moderately low' functioning. Only 3% of cases assessed with the *Parent/Caregiver Form* and none of the cases assessed with the *Interview Form*

would be classified as having normal functioning. **Caregiver acceptability** findings were mixed, with both positive and negative feedback provided about the Vineland-3. Caregivers tended to perceive Vineland-3 accuracy, ease of use and likelihood of recommending for clinical use more positively when they had completed the *Interview Form* only (via telephone with a clinician). Caregivers found the Vineland-3 to be relatively accurate and comprehensive, although some felt that the scores were lower than expected and there were too few response options. **Clinical utility** findings were consistent with the perspective provided by caregivers, where clinicians reported that the Vineland-3 was an established and widely used assessment of functioning, however expressed concerns around the burden it places on caregivers and its ability to comprehensively capture functioning in a meaningful way when considering the support needs of individuals on the autism spectrum and their families.

We note that these findings should be interpreted within the context of the limitations of the study design that have been described in the main report.

Appendix E - Additional Psychometric Properties and Usability for the Autism Sub-sample

PEDI-CAT (ASD)

Internal Consistency

Table 60. Internal Consistency Results for the PEDI-CAT (ASD) Domains for the Autism Sub-sample

Domain	Sample Size	No. Items	McDonald's Omega	Lower CI	Upper CI	Standard Error	Mean#	Standard Deviation#
Daily Activities	113	8	0.92	0.90	0.94	0.01	2.96	1.06
Mobility	113	16	0.89	0.83	0.93	0.02	3.01	1.20
Social/Cognitive	113	12	0.90	0.86	0.92	0.01	2.39	1.12
Responsibility	113	16	0.93	0.89	0.95	0.02	1.91	1.06

Note. Between .80 to .89 = good (light green); Above .90 = excellent (dark green).

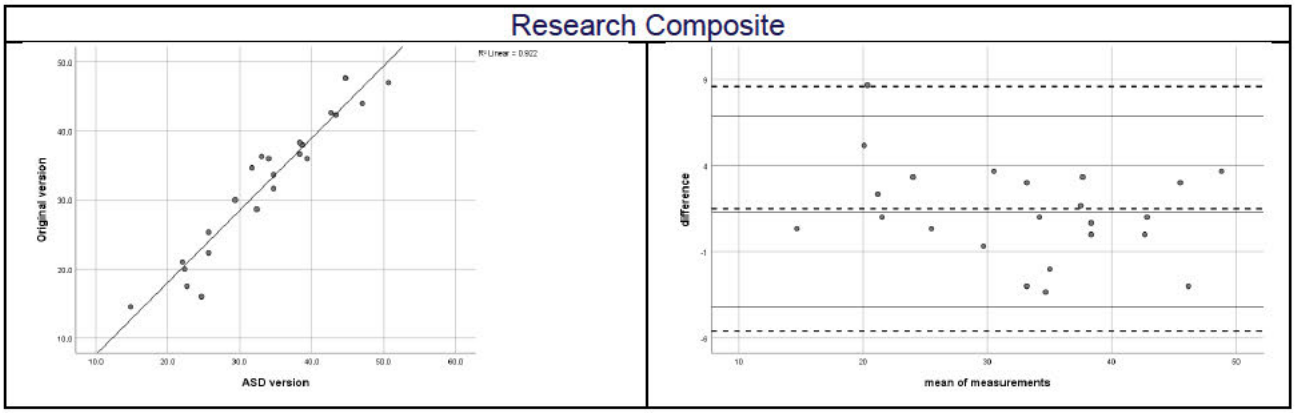
Alternate Forms Reliability

Table 61. Pearson Correlations, Paired T-Tests and Limits of Agreement between the PEDI-CAT (ASD) and PEDI-CAT (Original) for the Autism Sub-sample

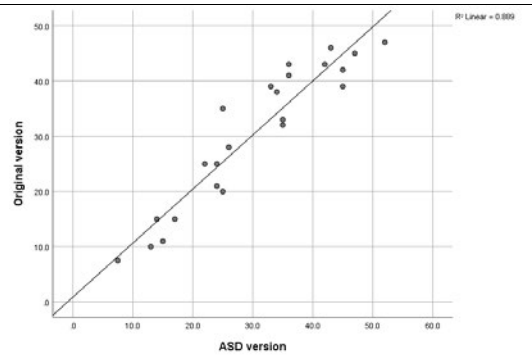
		Pearson Correlations	Dependent T-Tests (Paired Samples)			95% Limits of Agreement (LOA)		
Domain	***N***	***r***	**T-Value**	**Mean ASD**	**Mean Original**	**Mean Difference**	**Lower LOA**	**Upper LOA**
Research Composite	23	0.96**	2.23*	33.50	32.19	1.31	-4.21	6.84
Daily Activities	23	0.94**	-0.24	30.24	30.46	-0.22	-8.57	8.14
Mobility	23	0.94**	-0.19	29.67	29.96	-0.28	-13.96	13.39
Social/Cognitive	23	0.91**	4.53**	32.57	28.11	4.46	-4.79	13.70
Responsibility	23	0.86**	-0.35	37.70	38.00	-0.30	-8.46	7.85

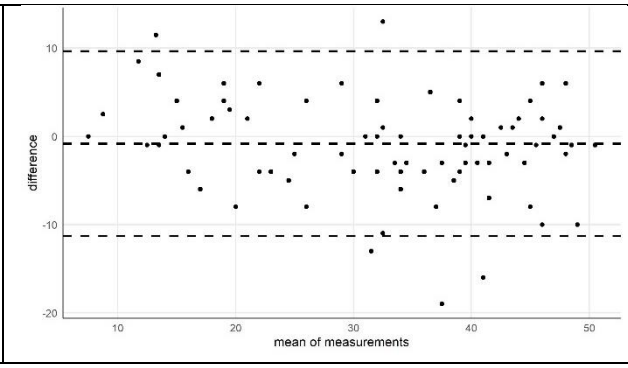
** Correlation is significant at the 0.01 level (2-tailed).
Note. Above .75 = good (green); Non-significant t-values indicate no difference (green).

Figure 5. Correlation Scatter Plots (Left) and Bland-Altman Plot with 95% Limits of Agreement (Right) between the PEDI-CAT (ASD) and PEDI-CAT (Original) for the Autism Sub-sample

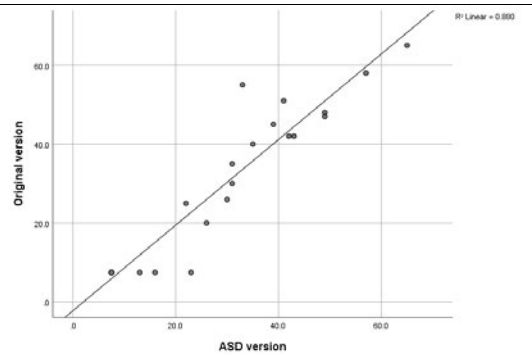


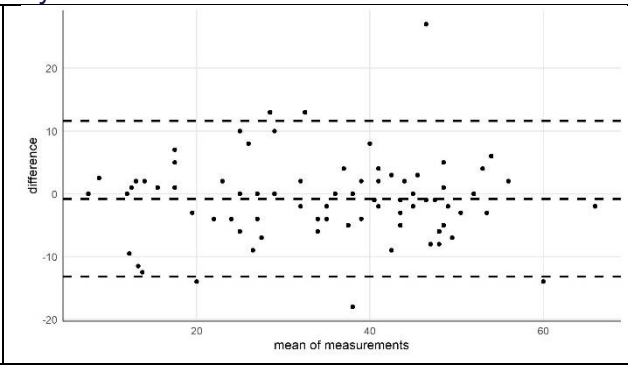
Daily Activities



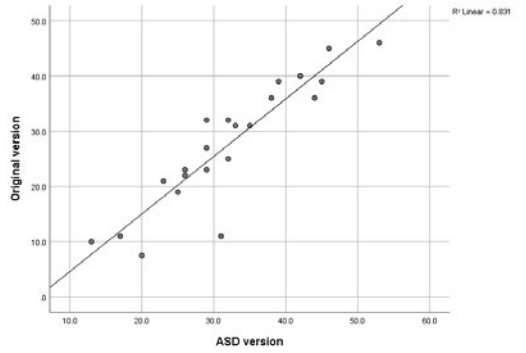


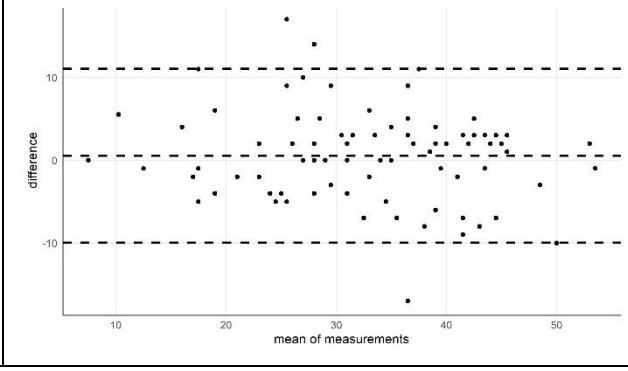
Mobility



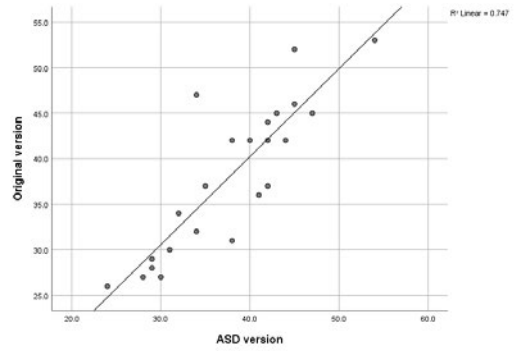


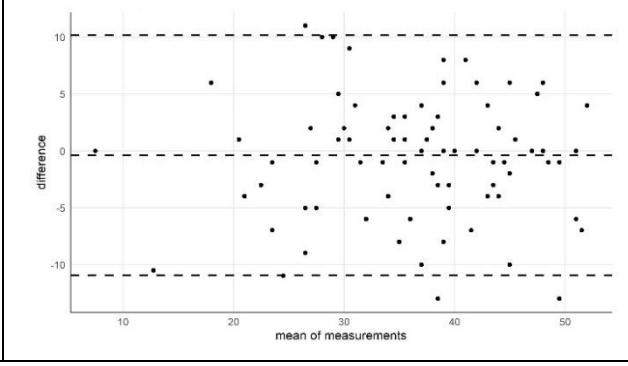
Social/Cognitive





Responsibility





Tables 62-71. Classification Comparison between the PEDI-CAT (Original) and PEDI-CAT (ASD) for the Various Domains According to the Categories Described in the Manual (Left) and the Categories Used by the NDIA (Right) for the Autism Sub-sample

Table 62 PEDI-CAT Research Composite – Manual Categories

		Original Version					
		Above Normal	Normal High	Normal	Normal Low	Below Normal	Total
ASD Version	Above Normal	0	0	0	0	0	0
	Normal High	0	0	0	0	0	0
	Normal	0	0	5	0	0	5
	Normal Low	0	0	0	9	1	10
	Below Normal	0	0	0	1	7	8
	Total	0	0	5	10	8	23

Note. 91% = Consistent Categories; 4% = Inconsistent Categories - Lower level of functioning according to ASD version; 4% = Inconsistent Categories - Lower level of functioning according to Original version

Table 63. PEDI-CAT Daily Actvities Domain – Manual Categories

		Original Version					
		Above Normal	Normal High	Normal	Normal Low	Below Normal	Total
ASD Version	Above Normal	0	0	0	0	0	0
	Normal High	0	0	0	0	0	0
	Normal	0	0	5	1	0	6
	Normal Low	0	0	2	4	0	6
	Below Normal	0	0	0	1	10	11
	Total	0	0	7	6	10	23

Note. 83% = Consistent Categories; 13% = Inconsistent Categories - Lower level of functioning according to ASD version; 4% = Inconsistent Categories - Lower level of functioning according to Original version

Table 67. PEDI-CAT Research Composite - NDIA Categories

		Original Version					
		Above 1.49 *SD* Below	1.50-1.99 *SD* Below	2.00-2.49 *SD* Below	2.50-2.99 *SD* Below	3 *SD* Below or Less	Total
ASD Version	Above 1.49 *SD* Below	9	0	0	0	0	9
	1.50-1.99 *SD* Below	2	3	1	0	0	6
	2.00-2.49 *SD* Below	0	0	2	1	0	3
	2.50-2.99 *SD* Below	0	0	0	1	3	4
	3 SD Below or Less	0	0	0	0	1	1
	Total	11	3	3	2	4	23

Note. 70% = Consistent Categories; 9% = Inconsistent Categories - Lower level of functioning according to ASD version; 22% = Inconsistent Categories - Lower level of functioning according to Original version

Table 68. PEDI-CAT Daily Activities Domain - NDIA Categories

		Original Version					
		Above 1.49 *SD* Below	1.50-1.99 *SD* Below	2.00-2.49 *SD* Below	2.50-2.99 *SD* Below	3 *SD* Below or Less	Total
ASD Version	Above 1.49 *SD* Below	8	0	0	0	0	8
	1.50-1.99 *SD* Below	2	2	0	0	0	4
	2.00-2.49 *SD* Below	0	0	1	0	0	1
	2.50-2.99 *SD* Below	0	1	0	3	1	5
	3 *SD* Below or Less	0	0	0	0	5	5
	Total	10	3	1	3	6	23

Note. 83% = Consistent Categories; 13% = Inconsistent Categories - Lower level of functioning according to ASD version; 4% = Inconsistent Categories - Lower level of functioning according to Original version

Table 64. PEDI-CAT Mobility Domain– Manual Categories

		Original Version					
		Above Normal	Normal High	Normal	Normal Low	Below Normal	Total
ASD Version	Above Normal	0	0	0	0	0	0
	Normal High	0	1	0	0	0	1
	Normal	0	0	6	0	0	6
	Normal Low	0	0	3	2	1	6
	Below Normal	0	0	0	0	10	10
	Total	0	1	9	2	11	23

Note. 83% = Consistent Categories; 13% = Inconsistent Categories - Lower level of functioning according to ASD version; 4% = Inconsistent Categories - Lower level of functioning according to Original version

Table 65. PEDI-CAT Social/Cognitive domain – Manual Categories

		Original Version					
		Above Normal	Normal High	Normal	Normal Low	Below Normal	Total
ASD Version	Above Normal	0	0	0	0	0	0
	Normal High	0	0	0	0	0	0
	Normal	0	0	4	2	0	6
	Normal Low	0	0	0	5	2	7
	Below Normal	0	0	0	1	9	10
	Total	0	0	4	8	11	23

Note. 78% = Consistent Categories; 4% = Inconsistent Categories - Lower level of functioning according to ASD version; 17% = Inconsistent Categories - Lower level of functioning according to Original version

Table 69. PEDI-CAT Mobility Domain - NDIA Categories

		Original Version					
		Above 1.49 *SD* Below	1.50-1.99 *SD* Below	2.00-2.49 *SD* Below	2.50-2.99 *SD* Below	3 *SD* Below or Less	Total
ASD Version	Above 1.49 *SD* Below	8	0	0	0	0	8
	1.50-1.99 *SD* Below	2	1	1	0	0	4
	2.00-2.49 *SD* Below	0	0	1	0	1	2
	2.50-2.99 *SD* Below	0	0	0	1	1	2
	3 *SD* Below or Less	0	0	0	0	7	7
	Total	10	1	2	1	9	23

Note. 78% = Consistent Categories; 9% = Inconsistent Categories - Lower level of functioning according to ASD version; 13% = Inconsistent Categories - Lower level of functioning according to Original version

Table 70. PEDI-CAT Social/Cognitive Domain - NDIA Categories

		Original Version					
		Above 1.49 *SD* Below	1.50-1.99 *SD* Below	2.00-2.49 *SD* Below	2.50-2.99 *SD* Below	3 *SD* Below or Less	Total
ASD Version	Above 1.49 *SD* Below	8	0	0	0	0	8
	1.50-1.99 *SD* Below	0	3	0	1	1	5
	2.00-2.49 *SD* Below	0	1	1	3	0	5
	2.50-2.99 *SD* Below	0	0	0	1	1	2
	3 *SD* Below or Less	0	0	0	0	3	3
	Total	8	4	1	5	5	23

Note. 70% = Consistent Categories; 4% = Inconsistent Categories - Lower level of functioning according to ASD version; 26% = Inconsistent Categories - Lower level of functioning according to Original version

Table 66. PEDI-CAT Responsibility Domain– Manual Categories

		Original Version					
		Above Normal	Normal High	Normal	Normal Low	Below Normal	Total
ASD Version	Above Normal	0	0	0	0	0	0
	Normal High	0	0	0	0	0	0
	Normal	0	0	9	2	0	11
	Normal Low	0	0	2	5	1	8
	Below Normal	0	0	0	0	4	4
	Total	0	0	11	7	5	23

Note. 78% = Consistent Categories; 9% = Inconsistent Categories - Lower level of functioning according to ASD version; 13% = Inconsistent Categories - Lower level of functioning according to Original version

Table 71. PEDI-CAT Responsibility Domain– Manual Categories

		Original Version					
		Above 1.49 *SD* Below	1.50-1.99 *SD* Below	2.00-2.49 *SD* Below	2.50-2.99 *SD* Below	3 *SD* Below or Less	Total
ASD Version	Above 1.49 *SD* Below	12	1	0	0	0	13
	1.50-1.99 *SD* Below	2	2	1	0	0	5
	2.00-2.49 *SD* Below	0	0	4	0	0	4
	2.50-2.99 *SD* Below	0	0	1	0	0	1
	3 *SD* Below or Less	0	0	0	0	0	0
	Total	14	3	6	0	0	23

Note. 78% = Consistent Categories; 13% = Inconsistent Categories - Lower level of functioning according to ASD version; 9% = Inconsistent Categories - Lower level of functioning according to Original version

Table 72. Pearson Correlations, Paired T-Tests and Limits of Agreement between the PEDI-CAT (ASD) and PEDI-CAT (Original) for the Autism Sub-sample by Severity Levels

<table>
<tr><th>Level</th><th>Social Communication</th><th>Restricted, Repetitive Behaviours</th></tr>
<tr><td>Level 1: Requiring support</td><td>Insufficient sample size</td><td>Insufficient sample size</td></tr>
<tr><td>Level 2: Requiring substantial support</td><td>
<table>
<tr><th></th><th></th><th>Pearson Correlations</th><th colspan="2">Dependent T-Tests (Paired Samples)</th><th colspan="3">95% Limits of Agreement (LOA)</th></tr>
<tr><th>Domain</th><th>n</th><th>r</th><th>T-Value</th><th>Mean ASD</th><th>Mean Original</th><th>Mean Difference</th><th>Lower LOA</th><th>Upper LOA</th></tr>
<tr><td>Daily Activities</td><td>13</td><td>0.92**</td><td>-0.63</td><td>33.46</td><td>34.15</td><td>-0.69</td><td>8.51</td><td>-7.12</td></tr>
<tr><td>Mobility</td><td>13</td><td>0.98**</td><td>-0.07</td><td>34.65</td><td>34.73</td><td>-0.08</td><td>7.99</td><td>-7.83</td></tr>
<tr><td>Social/ Cognitive</td><td>13</td><td>0.94**</td><td>4.09**</td><td>34.31</td><td>30.12</td><td>4.19</td><td>3.05</td><td>-11.43</td></tr>
<tr><td>Respons bility</td><td>13</td><td>0.91**</td><td>1.21</td><td>38.23</td><td>37.15</td><td>1.08</td><td>5.20</td><td>-7.35</td></tr>
</table>
**. Correlation is significant at the 0 01 level (2-tailed)
Note. Below .50 = poor (pink); Betw een 50 to .75 = moderate (orange); Above .75 = good (green); Non-significant t-values indicate no difference (green).
</td><td>
<table>
<tr><th></th><th></th><th>Pearson Correlations</th><th colspan="2">Dependent T-Tests (Paired Samples)</th><th colspan="3">95% Limits of Agreement (LOA)</th></tr>
<tr><th>Domain</th><th>n</th><th>r</th><th>T-Value</th><th>Mean ASD</th><th>Mean Original</th><th>Mean Difference</th><th>Lower LOA</th><th>Upper LOA</th></tr>
<tr><td>Daily Activities</td><td>12</td><td>0.95**</td><td>-0.97</td><td>29.42</td><td>30.50</td><td>-1.08</td><td>8.67</td><td>-6.51</td></tr>
<tr><td>Mobility</td><td>12</td><td>0.98**</td><td>-0.14</td><td>29.33</td><td>29.50</td><td>-0.17</td><td>8.32</td><td>-7.98</td></tr>
<tr><td>Social/ Cognitive</td><td>12</td><td>0.92**</td><td>3.65**</td><td>31.17</td><td>27.21</td><td>3.96</td><td>3.40</td><td>-11.32</td></tr>
<tr><td>Responsibility</td><td>12</td><td>0.84**</td><td>1.04</td><td>35.42</td><td>34.42</td><td>1.00</td><td>5.53</td><td>-7.53</td></tr>
</table>
**. Correlation is significant at the 0.01 level (2-tailed)
Note. Below .50 = poor (pink); Betw een .50 to .75 = moderate (orange); Above .75 = good (green); Non-significant t-values indicate no difference (green).
</td></tr>
<tr><td>Level 3: Requiring very substantial support</td><td>Insufficient sample size</td><td>Insufficient sample size</td></tr>
</table>

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Test-Retest Reliability

Table 73. Test-Retest Reliability (ICC) for PEDI-CAT (ASD) between Assessment 1 and 2 for the Autism Sub-sample

Domain	Pathway	ICC	*n*	Lower Bound	Upper Bound	F Value
Research Composite	2a	0.94 **	39	0.90	0.97	34.35
	2b	0.91 **	53	0.85	0.95	20.45
	Combined	0.93 **	92	0.89	0.95	25.72
Daily Activities	2a	0.95 **	39	0.91	0.97	40.38
	2b	0.89 **	53	0.83	0.94	18.16
	Combined	0.92 **	92	0.88	0.95	24.5
Mobility	2a	0.91 **	39	0.84	0.95	21.28
	2b	0.93 **	53	0.88	0.96	25.73
	Combined	0.92 **	92	0.88	0.95	23.56
Social/Cognitive	2a	0.92 **	39	0.86	0.96	24.41
	2b	0.88 **	53	0.80	0.93	16.39
	Combined	0.90 **	92	0.85	0.93	18.89
Responsibility	2a	0.90 **	39	0.81	0.94	18.05
	2b	0.88 **	53	0.80	0.93	15.39
	Combined	0.89 **	92	0.84	0.93	17.18

**Correlation is significant at the 0.01 level (2-tailed).
Note. Between .75 to .90 = good (light green); Above .90 = excellent (dark green).

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Table 74. Test-Retest Reliability (ICC) for PEDI-CAT (ASD) between Assessment 1 and 2 for the Autism Sub-sample by Severity Levels

Level 1: Requiring support

Social Communication					
Domain	**ICC**	***n***	**Lower Bound**	**Upper Bound**	**F Value**
Research Composite	0.92 **	30	0.85	0.96	24.42
Daily Activities	0.90 **	30	0.81	0.95	19.27
Mobility	0.88 **	30	0.77	0.94	15.93
Social/Cognitive	0.88 **	30	0.76	0.94	14.96
Responsibility	0.92 **	30	0.84	0.96	23.04

Restricted, Repetitive Behaviours					
Domain	**ICC**	***n***	**Lower Bound**	**Upper Bound**	**F Value**
Research Composite	0.94 **	34	0.87	0.97	29.31
Daily Activities	0.92 **	34	0.84	0.96	23.4
Mobility	0.90 **	34	0.8	0.95	17.99
Social/Cognitive	0.91 **	34	0.83	0.95	20.95
Responsibility	0.90 **	34	0.81	0.95	19.4

Level 2: Requiring substantial support

Social Communication					
Domain	**ICC**	***n***	**Lower Bound**	**Upper Bound**	**F Value**
Research Composite	0.86 **	33	0.73	0.93	12.48
Daily Activities	0.91 **	33	0.83	0.96	21.32
Mobility	0.88 **	33	0.77	0.94	15.49
Social/Cognitive	0.78 **	33	0.60	0.89	7.97
Responsibility	0.80 **	33	0.63	0.90	8.89

Restricted, Repetitive Behaviours					
Domain	**ICC**	***n***	**Lower Bound**	**Upper Bound**	**F Value**
Research Composite	0.90 **	37	0.81	0.95	17.8
Daily Activities	0.93 **	37	0.87	0.96	26.29
Mobility	0.90 **	37	0.82	0.95	19.7
Social/Cognitive	0.83 **	37	0.69	0.91	10.33
Responsibility	0.86 **	37	0.75	0.93	13.21

Level 3: Requiring very substantial support

Social Communication					
Domain	**ICC**	***n***	**Lower Bound**	**Upper Bound**	**F Value**
Research Composite	0.98 **	18	0.94	0.99	77.64
Daily Activities	0.98 **	18	0.95	0.99	97.78
Mobility	0.99 **	18	0.98	1.00	245.24
Social/Cognitive	0.97 **	18	0.92	0.99	58.50
Responsibility	0.94 **	18	0.84	0.98	28.83

Restricted, Repetitive Behaviours					
Domain	**ICC**	***n***	**Lower Bound**	**Upper Bound**	**F Value**
Research Composite	0.97 **	10	0.88	0.99	56.23
Daily Activities	0.97 **	10	0.89	0.99	64.80
Mobility	0.99 **	10	0.95	1.00	156.70
Social/Cognitive	0.96 **	10	0.87	0.99	55.87
Responsibility	0.92 **	10	0.71	0.98	21.42

**Correlation is significant at the 0.01 level (2-tailed)

Note. Below .50 = poor (pink); Between .50 to .75 = moderate (orange); Between .75 to .90 = good (light green); Above .90 = excellent (dark green).

Concurrent Validity

Table 75. Assessment 1 Correlations between PEDI-CAT (ASD) and Vineland-3 (*Parent/Caregiver Form*) for the Autism Sub-sample

	Vineland-3 (*Parent/Caregiver Form*) Domain						
PEDI-CAT (ASD) Domain	Adaptive Behavior Composite	Communication	Daily Living Skills	Socialization	Motor	Maladaptive Behavior (Internalizing)	Maladaptive Behavior (Externalizing)
Research Composite	0.73**	0.63**	0.73**	0.69**	0.58**	-0.30**	-0.11
Daily Activities	0.55**	0.43**	0.58**	0.51**	0.43**	-0.30**	-0.16
Mobility	0.48**	0.35**	0.48**	0.51**	0.43**	-0.29**	-0.16
Social/Cognitive	0.72**	0.67**	0.65**	0.71**	0.62**	-0.25*	-0.04
Responsibility	0.74**	0.63**	0.77**	0.67**	0.46**	-0.25*	-0.07

**Correlation is significant at the 0.01 level (2-tailed).
Note. Below .50 = poor (pink); Between .50 to .75 = moderate (orange); Above .75 = good (green).
n = 69 for relationships involving the Vineland-3 motor domain; *n* = 104 for relationships involving the Vineland-3 maladaptive scales; *n* = 110 for all other relationships.

Table 76. Assessment 2b Correlations between PEDI-CAT (ASD) and Vineland-3 (*Interview Form*) for the Autism Sub-sample

	Vineland-3 (*Interview Form*) Domain						
PEDI-CAT (ASD) Domain	Adaptive Behavior Composite	Communication	Daily Living Skills	Socialization	Motor	Maladaptive Behavior (Internalizing)	Maladaptive Behavior (Externalizing)
Research Composite	0.70**	0.64**	0.61**	0.48**	0.52**	0.02	0.15
Daily Activities	0.54**	0.49**	0.56**	0.30*	0.57**	0.07	0.14
Mobility	0.41**	0.30*	0.40**	0.30*	0.40*	-0.17	0.02
Social/Cognitive	0.64**	0.60**	0.46**	0.51**	0.45**	0.07	0.09
Responsibility	0.70**	0.62**	0.61**	0.50**	0.33	-0.11	0.15

**Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed).
Note. Below .50 = poor (pink); Between .50 to .75 = moderate (orange); Above .75 = good (green).
n = 32 for relationships involving the Vineland-3 motor domain; *n* = 63 for relationships involving the Vineland-3 maladaptive scales; *n* = 64 for all other relationships.

Tables 77-86. Classification Comparison between the PEDI-CAT(ASD) and Vineland-3 (*Parent/Caregiver Form*) Domains According to the Categories Described in the Manual (Left) and the Categories Used by the NDIA (Right) for the Autism Sub-sample

Table 77. PEDI-CAT (ASD) Daily Activities and Vineland-3 Daily Living Skills – Manual Categories

		Vineland-3 (*Parent/Caregiver Form*) Daily Living Skills					
		High	Moderately High	Adequate	Moderately Low	Low	Total
PEDI-CAT (ASD) Daily Activities	Above Normal	0	0	0	0	0	0
	Normal High	0	0	0	0	0	0
	Normal	0	0	12	22	6	40
	Normal Low	0	0	0	9	15	24
	Below Normal	0	0	1	17	28	46
	Total	0	0	13	48	49	110

Note. 45% = Consistent Categories; 16% = Inconsistent Categories - Lower level of functioning according to PEDI-CAT (ASD); 39% = Inconsistent Categories - Lower level of functioning according to Vineland-3.

Table 78. PEDI-CAT (ASD) Mobility and Vineland-3 Motor Skills – Manual Categories

		Vineland-3 (*Parent/Caregiver Form*) Motor Skills					
		High	Moderately High	Adequate	Moderately Low	Low	Total
PEDI-CAT (ASD) Mobility	Above Normal	0	0	1	0	0	1
	Normal High	0	0	1	0	0	1
	Normal	0	0	16	18	3	37
	Normal Low	0	0	1	13	2	16
	Below Normal	0	0	0	14	0	14
	Total	0	0	19	45	5	69

Note. 42% = Consistent Categories; 22% = Inconsistent Categories - Lower level of functioning according to PEDI-CAT (ASD); 36% = Inconsistent Categories - Lower level of functioning according to Vineland-3.

Table 82. PEDI-CAT (ASD) Daily Activities and Vineland-3 Daily Living Skills – NDIA Categories

		Vineland-3 (*Parent/Caregiver Form*) Daily Living Skills					
		Above 1.49 *SD* Below	1.50-1.99 *SD* Below	2.00-2.49 *SD* Below	2.50-2.99 *SD* Below	3 *SD* Below or Less	Total
PEDI-CAT (ASD) Daily Activities	Above 1.49 *SD* Below	28	9	12	3	0	52
	1.50-1.99 *SD* Below	4	2	3	2	1	12
	2.00-2.49 *SD* Below	2	5	1	2	0	10
	2.50-2.99 *SD* Below	2	2	1	1	0	6
	3 *SD* Below or Less	5	2	9	5	9	30
	Total	41	20	26	13	10	110

Note. 37% = Consistent Categories; 34% = Inconsistent Categories - Lower level of functioning according to PEDI-CAT (ASD); 29% = Inconsistent Categories - Lower level of functioning according to Vineland-3.

Table 83. PEDI-CAT (ASD) Mobility and Vineland-3 Motor Skills – NDIA Categories

		Vineland-3 (*Parent/Caregiver Form*) Motor Skills					
		Above 1.49 *SD* Below	1.50-1.99 *SD* Below	2.00-2.49 *SD* Below	2.50-2.99 *SD* Below	3 *SD* Below or Less	Total
PEDI-CAT (ASD) Mobility	Above 1.49 *SD* Below	35	10	4	1	0	50
	1.50-1.99 *SD* Below	2	3	0	0	0	5
	2.00-2.49 *SD* Below	4	2	0	0	0	6
	2.50-2.99 *SD* Below	1	2	0	0	0	3
	3 *SD* Below or Less	1	4	0	0	0	5
	Total	43	21	4	1	0	69

Note. 55% = Consistent Categories; 23% = Inconsistent Categories - Lower level of functioning according to PEDI-CAT (ASD); 22% = Inconsistent Categories - Lower level of functioning according to Vineland-3.

Table 79. PEDI-CAT (ASD) Social/Cognitive and Vineland-3 Communication – Manual Categories

		Vineland-3 (*Parent/Caregiver Form*) Communication					
		High	Moderately High	Adequate	Moderately Low	Low	Total
PEDI-CAT (ASD) Social/ Cognitive	Above Normal	0	0	0	0	0	0
	Normal High	0	0	0	0	0	0
	Normal	0	0	10	19	4	33
	Normal Low	0	0	2	17	10	29
	Below Normal	0	0	0	24	24	48
	Total	0	0	12	60	38	110

Note. 46% = Consistent Categories; 24% = Inconsistent Categories - Lower level of functioning according to PEDI-CAT (ASD); 30% = Inconsistent Categories - Lower level of functioning according to Vineland-3.

Table 80. PEDI-CAT (ASD) Social/Cognitive and Vineland-3 Socialization – Manual Categories

		Vineland-3 (*Parent/Caregiver Form*) Socialization					
		High	Moderately high	Adequate	Moderately low	Low	Total
PEDI-CAT (ASD) Social/Cognitive	Above Normal	0	0	0	0	0	0
	Normal High	0	0	0	0	0	0
	Normal	0	0	8	19	6	33
	Normal Low	0	0	1	12	16	29
	Below Normal	0	0	0	13	35	48
	Total	0	0	9	44	57	110

Note. 50% = Consistent Categories; 13% = Inconsistent Categories - Lower level of functioning according to PEDI-CAT (ASD); 37% = Inconsistent Categories - Lower level of functioning according to Vineland-3.

Table 84. PEDI-CAT (ASD) Social/Cognitive and Vineland-3 Communication – NDIA Categories

		Vineland-3 (*Parent/Caregiver Form*) Communication					
		Above 1.49 *SD* Below	1.50-1.99 *SD* Below	2.00-2.49 *SD* Below	2.50-2.99 *SD* Below	3 *SD* Below or Less	Total
PEDI-CAT (ASD) Social/ Cognitive	Above 1.49 SD Below	25	10	6	0	0	41
	1.50-1.99 SD Below	3	6	5	1	1	16
	2.00-2.49 SD Below	4	11	6	0	1	22
	2.50-2.99 SD Below	4	4	3	1	0	12
	3 SD Below or Less	2	3	2	3	9	19
	Total	38	34	22	5	11	110

Note. 43% = Consistent Categories; 35% = Inconsistent Categories - Lower level of functioning according to PEDI-CAT (ASD); 22% = Inconsistent Categories - Lower level of functioning according to Vineland-3.

Table 85. PEDI-CAT (ASD) Social/Cognitive and Vineland-3 Socialization – NDIA Categories

		Vineland-3 (*Parent/Caregiver Form*) Socialization					
		Above 1.49 *SD* Below	1.50-1.99 *SD* Below	2.00-2.49 *SD* Below	2.50-2.99 *SD* Below	3 *SD* Below or Less	Total
PEDI-CAT (ASD) Social/Cognitive	Above 1.49 *SD* Below	22	11	4	2	2	41
	1.50-1.99 *SD* Below	3	2	5	5	1	16
	2.00-2.49 *SD* Below	4	4	9	3	2	22
	2.50-2.99 *SD* Below	1	4	5	2	0	12
	3 *SD* Below or Less	1	1	2	4	11	19
	Total	31	22	25	16	16	110

Note. 42% = Consistent Categories; 26% = Inconsistent Categories - Lower level of functioning according to PEDI-CAT (ASD); 32% = Inconsistent Categories - Lower level of functioning according to Vineland-3.

Table 81. PEDI-CAT (ASD) Responsibility and Vineland-3 Daily Living Skills – Manual Categories

		Vineland-3 (*Parent/Caregiver Form*) Daily Living Skills					
		High	Moderately high	Adequate	Moderately low	Low	Total
PEDI-CAT (ASD) Responsibility	Above Normal	0	0	0	0	0	0
	Normal High	0	0	0	0	0	0
	Normal	0	0	10	22	6	38
	Normal Low	0	0	3	21	18	42
	Below Normal	0	0	0	5	25	30
	Total	0	0	13	48	49	110

Note. 51% = Consistent Categories; 7% = Inconsistent Categories - Lower level of functioning according to PEDI-CAT (ASD); 42% = Inconsistent Categories - Lower level of functioning according to Vineland-3.

Table 86. PEDI-CAT (ASD) Responsibility and Vineland-3 Daily Living Skills – NDIA Categories

		Vineland-3 (*Parent/Caregiver Form*) Daily Living Skills					
		Above 1.49 *SD* Below	1.50-1.99 *SD* Below	2.00-2.49 *SD* Below	2.50-2.99 *SD* Below	3 *SD* Below or Less	Total
PEDI-CAT (ASD) Responsibility	Above 1.49 *SD* Below	35	9	11	4	0	59
	1.50-1.99 *SD* Below	6	5	4	3	0	18
	2.00-2.49 *SD* Below	0	4	5	2	1	12
	2.50-2.99 *SD* Below	0	2	5	2	1	10
	3 *SD* Below or Less	0	0	1	2	8	11
	Total	41	20	26	13	10	110

Note. 50% = Consistent Categories; 18% = Inconsistent Categories - Lower level of functioning according to PEDI-CAT (ASD); 32% = Inconsistent Categories - Lower level of functioning according to Vineland-3.

Table 87. Assessment 1 Correlations between PEDI-CAT (ASD) and Vineland-3 (*Parent/Caregiver Form*) for the Autism Sub-sample by Severity Levels

Level 1: Requiring support

Social Communication

PEDI-CAT (ASD) Domain	Vineland-3 (Parent/Caregiver Form) Domain: Adaptive Behavior Composite	Communication	Daily Living Skills	Socialisation	Motor	Maladaptive Behavior (Internalising)	Maladaptive Behavior (Externalising)
Research Composite	**0.71****	0.54**	0.73**	0.62**	0.53*	-0.21	-0.3
Daily Activities	0.52**	0.35*	**0.57****	0.46**	0.57**	-0.21	-0.3
Mobility	0.39*	0.23	0.40*	0.40*	**0.64****	-0.11	-0.22
Social/Cognitive	0.78**	**0.65****	0.68**	**0.71****	0.58**	-0.21	-0.24
Responsibility	0.62**	0.45**	**0.71****	0.51**	0.22	-0.14	-0.24

**. Correlation is significant at the 0 01 level (2-tailed);

Note. Below 50 = poor (pink); Between .50 to .75 = moderate (orange); Above .75 = good (green).

n = 19 for relationships involving the Vineland-3 motor domain; *n* = 28 for relationships involving the Vineland-3 maladaptive scales; *n* = 30 for all other relationships.

Restricted, Repetitive Behaviours

PEDI-CAT (ASD) Domain	Vineland-3 (Parent/Caregiver Form) Domain: Adaptive Behavior Composite	Communication	Daily Living Skills	Socialisation	Motor	Maladaptive Behavior (Internalising)	Maladaptive Behavior (Externalising)
Research Composite	**0.72****	0.56**	0.77**	0.72**	0.59**	-0.19	-0.24
Daily Activities	0.54**	0.39*	**0.61****	0.57**	0.62**	-0.23	-0.31
Mobility	0.51**	0.32	0.56**	0.58**	**0.49***	-0.26	-0.3
Social/Cognitive	0.75**	**0.62****	0.76**	**0.76****	0.68**	-0.16	-0.22
Respons bility	0.68**	0.53**	**0.75****	0.63**	0.23	-0.11	-0.12

**. Correlation is significant at the 0 01 level (2-tailed);

Note. Below .50 = poor (pink); Between 50 to .75 = moderate (orange); Above .75 = good (green).

n = 19 for relationships involving the Vineland-3 motor domain; *n* = 31 for relationships involving the Vineland-3 maladaptive scales; *n* = 32 for all other relationships.

Level 2: Requiring substantial support

PEDI-CAT (ASD) Domain	Vineland-3 (Parent/Caregiver Form) Domain: Adaptive Behavior Composite	Communication	Daily Living Skills	Socialisation	Motor	Maladaptive Behavior (Internalising)	Maladaptive Behavior (Externalising)
Research Composite	**0.59****	0.49**	0.57**	0.49**	0.64**	-0.26	0.18
Daily Activities	0.34*	0.27	**0.32**	0.28	0.41*	-0.24	0.17
Mobility	0.18	0.09	0.18	0.16	**0.36**	-0.23	0.02
Social/Cognitive	0.64**	**0.57****	0.55**	**0.57****	0.67**	-0.21	0.25
Respons bility	0.57**	0.44**	**0.62****	0.44**	0.56**	-0.21	0.03

**. Correlation is significant at the 0 01 level (2-tailed);

Note. Below .50 = poor (pink); Betw een 50 to .75 = moderate (orange); Above .75 = good (green).

n = 26 for relationships involving the Vineland-3 motor domain; *n* = 33 for relationships involving the Vineland-3 maladaptive scales; *n* = 36 for all other relationships.

PEDI-CAT (ASD) Domain	Vineland-3 (Parent/Caregiver Form) Domain: Adaptive Behavior Composite	Communication	Daily Living Skills	Socialisation	Motor	Maladaptive Behavior (Internalising)	Maladaptive Behavior (Externalising)
Research Composite	**0.67****	0.58**	0.64**	0.58**	0.58**	-0.36*	0.04
Daily Activities	0.44**	0.34*	**0.43****	0.36*	0.35*	-0.36*	0.01
Mobility	0.28	0.17	0.27	0.24	**0.4***	-0.27	-0.06
Social/Cognitive	0.69**	**0.65****	0.58**	**0.65****	0.60**	-0.31	0.17
Respons bility	0.67**	0.55**	**0.7****	0.54**	0.56**	-0.27	-0.07

**. Correlation is significant at the 0.01 level (2-tailed);

Note. Below .50 = poor (pink); Betw een 50 to .75 = moderate (orange); Above .75 = good (green).

n = 32 for relationships involving the Vineland-3 motor domain; *n* = 38 for relationships involving the Vineland-3 maladaptive scales; *n* = 42 for all other relationships.

Level 3: Requiring very substantial support

PEDI-CAT (ASD) Domain	Vineland-3 (Parent/Caregiver Form) Domain: Adaptive Behavior Composite	Communication	Daily Living Skills	Socialisation	Motor	Maladaptive Behavior (Internalising)	Maladaptive Behavior (Externalising)
Research Composite	**0.91****	0.84**	0.91**	0.86**	0.63*	-0.45	0.03
Daily Activities	0.88**	0.79**	**0.90****	0.78**	0.51	-0.43	0.03
Mobility	0.80**	0.63**	0.81**	0.80**	**0.41**	-0.57*	0.03
Social/Cognitive	0.88**	**0.83****	0.85**	**0.88****	0.60*	-0.4	0.04
Respons bility	0.85**	0.77**	**0.88****	0.80**	0.55	-0.47	0.02

**. Correlation is significant at the 0 01 level (2-tailed);

Note. Below .50 = poor (pink); Betw een 50 to .75 = moderate (orange); Above .75 = good (green).

n = 16 for relationships involving the Vineland-3 motor domain; *n* = 10 for relationships involving the Vineland-3 maladaptive scales; *n* = 16 for all other relationships.

Insufficient sample size

Table 88. Assessment 2b Correlations between PEDI-CAT (ASD) and Vineland-3 (*Interview Form*) for the Autism Sub-sample by Severity Levels

Level 1: Requiring support

Social Communication

PEDI-CAT (ASD) Domain	Vineland-3 (Interview Form) Domain: Adaptive Behavior Composite	Communication	Daily Living Skills	Socialisation	Motor	Maladaptive Behavior (Internalising)	Maladaptive Behavior (Externalising)
Research Composite	**0.70****	0.71**	0.68**	0.36		0.35	0.07
Daily Activities	0.54*	0.54*	**0.55****	0.27		0.25	0.08
Mobility	0.49*	0.46*	0.52*	0.26		0.15	0.05
Social/Cognitive	0.64**	**0.69****	0.58**	**0.35**		0.36	0.06
Respons bility	0.78**	0.78**	**0.79****	0.38		0.37	0.04

**. Correlation is significant at the 0.01 level (2-tailed); *. Correlation is significant at the 0.05 level (2-tailed).

Note. Below .50 = poor (pink); Between 50 to .75 = moderate (orange); Above .75 = good (green).

n = 8 for relationships involving the Vineland-3 motor domain; n = 19 for all other relationships.

Restricted, Repetitive Behaviours

PEDI-CAT (ASD) Domain	Vineland-3 (Interview Form) Domain: Adaptive Behavior Composite	Communication	Daily Living Skills	Socialisation	Motor	Maladaptive Behavior (Internalising)	Maladaptive Behavior (Externalising)
Research Composite	**0.59****	0.50**	0.47*	0.48*	0.48	0.13	-0.02
Daily Activities	0.44*	0.38	**0.37**	0.33	0.47	0.12	0.02
Mobility	0.45*	0.35	0.40*	0.39*	**0.27**	0.07	0.02
Social/Cognitive	0.55**	**0.50****	0.37	**0.50****	0.48	0.13	-0.08
Respons bility	0.66**	0.53**	**0.57****	0.52**	0.36	0.11	-0.02

**. Correlation is significant at the 0.01 level (2-tailed); *. Correlation is significant at the 0.05 level (2-tailed).

Note. Below .50 = poor (pink); Between 50 to .75 = moderate (orange); Above .75 = good (green).

n = 13 for relationships involving the Vineland-3 motor domain; n = 25 for all other relationships.

Level 2: Requiring substantial support

Social Communication

PEDI-CAT (ASD) Domain	Vineland-3 (Interview Form) Domain: Adaptive Behavior Composite	Communication	Daily Living Skills	Socialisation	Motor	Maladaptive Behavior (Internalising)	Maladaptive Behavior (Externalising)
Research Composite	**0.68****	0.59**	0.58**	0.41*	0.34	0.04	0.31
Daily Activities	0.54**	0.54**	**0.42***	0.27	0.54*	0.08	0.45*
Mobility	0.47*	0.35	0.38*	0.37	**0.46***	-0.15	0.12
Social/Cognitive	0.70**	**0.55****	0.59**	**0.49****	0.13	0.06	0.16
Respons bility	0.58**	0.46*	**0.58****	0.34	0.09	-0.06	0.14

**. Correlation is significant at the 0.01 level (2-tailed); *. Correlation is significant at the 0.05 level (2-tailed).

Note. Below .50 = poor (pink); Between 50 to .75 = moderate (orange); Above .75 = good (green).

n = 17 for relationships involving the Vineland-3 motor domain; n = 26 for all other relationships.

Restricted, Repetitive Behaviours

PEDI-CAT (ASD) Domain	Vineland-3 (Interview Form) Domain: Adaptive Behavior Composite	Communication	Daily Living Skills	Socialisation	Motor	Maladaptive Behavior (Internalising)	Maladaptive Behavior (Externalising)
Research Composite	**0.62****	0.54**	0.64**	0.11	0.66**	0.36	0.29
Daily Activities	0.48*	0.46*	**0.50***	0.02	0.69**	0.21	0.37
Mobility	0.32	0.23	0.37	0.08	**0.56***	-0.02	0.02
Social/Cognitive	0.70**	**0.57****	0.66**	**0.27**	0.58*	0.44*	0.20
Respons bility	0.49*	0.42*	**0.60****	-0.01	0.44	0.36	0.14

**. Correlation is significant at the 0.01 level (2-tailed); *. Correlation is significant at the 0.05 level (2-tailed).

Note. Below .50 = poor (pink); Between 50 to .75 = moderate (orange); Above .75 = good (green).

n = 14 for relationships involving the Vineland-3 motor domain; n = 22 for all other relationships.

Level	Social Communication	Restricted, Repetitive Behaviours
Level 3	Insufficient sample size	Insufficient sample size

Applicability

Table 89. Number and Proportion of Participants with at Least One Domain Score Rated at or Below Each Threshold of Standard Deviations Below the Mean for the PEDI-CAT (ASD) for the Autism Sub-sample

Threshold	**PEDI-CAT (ASD) Assessment 1** (*n*)
Total sample	111
1 *SD* below mean	96 (86%)
1.5 *SD* below mean	82 (74%)
2 *SD* below mean	65 (59%)
2.5 *SD* below mean	52 (47%)
3 *SD* below mean	37 (33%)

Table 90. Number and Proportion of Participants with at Least One Domain Score Rated at or Below Each Threshold of Standard Deviations Below the Mean for the PEDI-CAT (ASD) for the Autism Sub-sample by Severity Levels

	PEDI-CAT (ASD) Assessment 1 (*n*)					
	ASD - Social Communication Sub-sample					
	Level 1		Level 2		Level 3	
Total sample	33		38		17	
1 *SD* below mean	27	(82%)	34	(89%)	15	(88%)
1.5 *SD* below mean	25	(76%)	26	(68%)	12	(71%)
2 *SD* below mean	19	(58%)	21	(55%)	8	(47%)
2.5 *SD* below mean	17	(52%)	15	(39%)	7	(41%)
3 *SD* below mean	13	(39%)	6	(16%)	6	(35%)

	PEDI-CAT (ASD) Assessment 1 (*n*)					
	ASD - Restricted, Repetitive Behaviours Sub-sample					
	Level 1		Level 2		Level 3	
Total sample	35		43		10	
1 *SD* below mean	28	(80%)	39	(91%)	9	(90%)
1.5 *SD* below mean	25	(71%)	29	(67%)	9	(90%)
2 *SD* below mean	18	(51%)	23	(53%)	7	(70%)
2.5 *SD* below mean	15	(43%)	18	(42%)	6	(60%)
3 *SD* below mean	11	(31%)	10	(23%)	4	(40%)

Vineland-3

Internal Consistency

Table 91. Internal Consistency Results for the Assessment 1 *Vineland-3 Parent/Caregiver Form* Sub-domains for the Autism Sub-sample

Domain / Subdomain	Sample Size	No. Items	McDonald's Omega	Lower CI	Upper CI	Standard Error	Mean#	Standard Deviation#
Adaptive Behavior Composite	114	0	Not able to calculate					
Communication	114	0	Not able to calculate					
Receptive	114	18	0.93	0.90	0.95	0.01	1.03	0.75
Expressive	114	11	0.94	0.92	0.96	0.01	1.05	0.76
Written	114	0	Not able to calculate					
Daily Living Skills	114	0	Not able to calculate					
Personal	114	13	0.90	0.86	0.92	0.02	0.87	0.76
Domestic	114	13	0.88	0.85	0.92	0.02	0.77	0.72
Community	114	0	Not able to calculate					
Socialization	114	0	Not able to calculate					
Interpersonal Relationships	114	32	0.91	0.88	0.93	0.01	0.95	0.74
Play	114	27	0.93	0.90	0.95	0.01	0.99	0.73
Coping	114	28	0.92	0.89	0.94	0.01	0.93	0.71
Motor Skills	73	0	Not able to calculate					
Gross Motor	73	8	0.77	0.51	0.88	0.08	1.20	0.83
Fine Motor	73	9	0.88	0.79	0.92	0.03	1.01	0.79
Maladaptive Behavior	110	0	Not able to calculate					
Internal	110	13	0.87	0.83	0.89	0.02	0.96	0.77
External	110	11	0.84	0.78	0.88	0.03	0.72	0.77
Critical	110	20	0.84	0.80	0.88	0.02	0.50	0.71

Note. Below .70 = unacceptable (pink); Between .70 to .79 = fair (orange); Between .80 to .89 = good (light green); Above .90 = excellent (dark green).

Table 92. Internal Consistency Results for the Assessment 2b *Vineland-3 Interview Form* Sub-domains for the Autism Sub-sample

Domain / Subdomain	Sample Size	No. Items	McDonald's Omega	Lower CI	Upper CI	Standard Error	Mean#	Standard Deviation#
Adaptive Behavior Composite	80	0	Not able to calculate					
Communication	80	0	Not able to calculate					
Receptive	80	23	0.87	0.76	0.92	0.07	1.13	0.84
Expressive	80	13	0.85	0.77	0.91	0.04	1.17	0.85
Written	80	0	Not able to calculate					
Daily Living Skills	80	0	Not able to calculate					
Personal	80	14	0.85	0.79	0.89	0.03	0.97	0.88
Domestic	80	9	0.93	0.77	0.87	0.03	0.81	0.90
Community	80	5	0.66	0.55	0.75	0.14	1.24	0.87
Socialization	80	0	Not able to calculate					
Interpersonal Relationships	80	21	0.84	0.77	0.90	0.03	0.85	0.83
Play	80	16	0.86	0.75	0.91	0.04	0.97	0.88
Coping	80	19	0.75	0.46	0.85	0.08	0.86	0.83
Motor Skills	42	0	Not able to calculate					
Gross Motor	42	8	0.96	0.67	0.92	0.06	1.31	0.90
Fine Motor	42	15	0.90	0.78	0.90	0.04	1.29	0.90
Maladaptive Behavior	79	0	Not able to calculate					
Internal	79	13	0.76	0.64	0.84	0.06	1.01	0.81
External	79	11	0.83	0.77	0.87	0.03	0.63	0.75
Critical	79	20	0.70	0.47	0.83	0.09	0.52	0.73

Note. Below .70 = unacceptable (pink); Between .70 to .79 = fair (orange); Between .80 to .89 = good (light green); Above .90 = excellent (dark green).