



Transforming the clinical pathway for children with autism and neurodevelopmental conditions: from big data to novel assessments

Mirko Uljarevic, MD, PhD

Professor,

Future Health Research and Innovation (FHRI) Fund

Distinguished Fellow



Acknowledge Aboriginal and Torres Strait Islander peoples as the Traditional Custodians of the land and waters across Australia. We honour the Nyoongar Wadjuk, Yawuru, Kariyarra and Kurna Elders — past, present and emerging — on whose Country our work takes place, and recognize their enduring connection to Country, culture, and community. Their profound wisdom is invaluable in guiding efforts to achieve better health, development, and well-being outcomes for all children.



Professor Susan Leekam,
Cardiff University



Prof. Antonio Hardan,
Stanford University



Professor Andrew Whitehouse
Kids Research Institute



Prof. Thomas Frazier,
John Carroll University



Dr. Gail Alvares,
Kids Research Institute



Dr. Lacey Chetcuti,
Kids Research Institute/Yale University



Dr. Darren Hedley,
La Trobe University



Dr. Emily Spackman,
Kids Research Institute



Professor Eric Youngstrom,
Nationwide Children's Hospital



Prof. Bob Krueger,
University of Minnesota

- “It appears to me a most excellent thing for the physician to cultivate Prognosis; for by foreseeing and foretelling, in the presence of the sick, the present, the past and the future. [...] ***And he will manage the cure best who has foreseen what is to happen from the present state of matters***” Hippocrates, *The Book of Prognostics*

- “It appears to me a most excellent thing for the physician to cultivate Prognosis; for by foreseeing and foretelling, in the presence of the sick, the present, the past and the future. [...] ***And he will manage the cure best who has foreseen what is to happen from the present state of matters***” Hippocrates, *The Book of Prognostics*

Participants’ ratings of the utility of the ICD-10 and DSM and existing assessments during the past year (First et al. World Psychiatry 2018;17:187-95):

- “It appears to me a most excellent thing for the physician to cultivate Prognosis; for by foreseeing and foretelling, in the presence of the sick, the present, the past and the future. [...] ***And he will manage the cure best who has foreseen what is to happen from the present state of matters***” Hippocrates, *The Book of Prognostics*

Participants’ ratings of the utility of the ICD-10 and DSM and existing assessments during the past year (First et al. World Psychiatry 2018;17:187-95):

High Rating:

- ✓ “assigning diagnosis”
- ✓ “meeting administrative requirements”,
- ✓ “communicating with other health professionals”
- ✓ “teaching trainees or students”

- “It appears to me a most excellent thing for the physician to cultivate Prognosis; for by foreseeing and foretelling, in the presence of the sick, the present, the past and the future. [...] ***And he will manage the cure best who has foreseen what is to happen from the present state of matters***” Hippocrates, *The Book of Prognostics*

Participants’ ratings of the utility of the ICD-10 and DSM and existing assessments during the past year (First et al. World Psychiatry 2018;17:187-95):

High Rating:

- ✓ “assigning diagnosis”
- ✓ “meeting administrative requirements”,
- ✓ “communicating with other health professionals”
- ✓ “teaching trainees or students”

Low Rating:

- ✓ “selecting a treatment”
- ✓ “assessing probable prognosis”

Autism

Autism is the largest and fastest-growing group in Australia's national disability scheme — yet access and outcomes remain poor.

36%

of NDIS participants have autism as their primary disability — the largest cohort in the \$45b/year scheme

25,320

children were waiting for access to services — 2025

23.9 months

median wait time for an autism diagnostic assessment

What independent scrutiny found

”

“The outcomes for autistic people are unacceptably poor.”

— Senate inquiry into services for people with autism spectrum disorder, 2025

The diagnostic model itself is under strain

Four structural issues make autism and related conditions difficult to assess with the tools clinicians use today.

1

Comorbidity

People with neurodevelopmental and neuropsychiatric conditions typically meet criteria for more than one diagnosis, and many conditions share underlying causes.

2

Blurred category boundaries

Within-category heterogeneity and across-category similarity mean key clinical features don't map cleanly onto diagnostic labels.

3

Weak evidential footing

Current clinical phenotypes lack robust empirical and factorial validity, undermining confidence in the categories themselves.

4

No natural cut-points

Subthreshold symptoms remain valid and meaningful — these are continuous phenomena in nature, not clean categories.

Bottom line → categorical diagnosis alone can't capture what clinicians see in practice.

1

Assessment is burdensome

Complex, time-intensive assessment pathways contribute to long waits, high costs and missed opportunities.

2

Supports are not consistently matched

When individual differences are poorly characterised, support can become a costly trial-and-error process.

3

Research and practice remain disconnected

Advances in measurement and research do not reliably translate into routine clinical decision-making.

1

Assessment is burdensome

Complex, time-intensive assessment pathways contribute to long waits, high costs and missed opportunities.

2

Supports are not consistently matched

When individual differences are poorly characterised, support can become a costly trial-and-error process.

3

Research and practice remain disconnected

Advances in measurement and research do not reliably translate into routine clinical decision-making.

Clinicians lack critical information to guide their decision-making

1

Assessment is burdensome

Complex, time-intensive assessment pathways contribute to long waits, high costs and missed opportunities.

2

Supports are not consistently matched

When individual differences are poorly characterised, support can become a costly trial-and-error process.

3

Research and practice remain disconnected

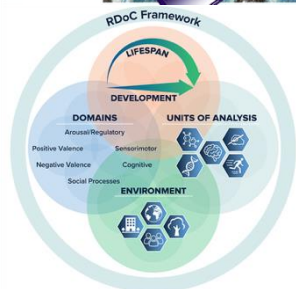
Advances in measurement and research do not reliably translate into routine clinical decision-making.

Clinicians lack critical information to guide their decision-making

Person-centered,
measurement-based
care



Call for Papers on Utilizing Dimensional Approaches to Advance Science and Clinical Practice in Childhood-Onset Neurodevelopmental and Neuropsychiatric Disorders
Proposal Deadline: November 15, 2024



1

Assessment is burdensome

Complex, time-intensive assessment pathways contribute to long waits, high costs and missed opportunities.

2

Supports are not consistently matched

When individual differences are poorly characterised, support can become a costly trial-and-error process.

3

Research and practice remain disconnected

Advances in measurement and research do not reliably translate into routine clinical decision-making.

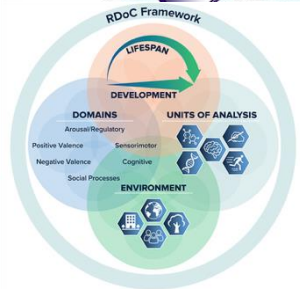
Clinicians lack critical information to guide their decision-making

Person-centered,
measurement-based
care



Call for Papers on Utilizing Dimensional Approaches to Advance Science and Clinical Practice in Childhood-Onset Neurodevelopmental and Neuropsychiatric Disorders

Proposal Deadline: November 15, 2024



HiTOP

Deliver an evidence-based approach to support matching through novel assessments that provides more accurate, efficient, and cost-effective assessment, characterise clinical heterogeneity, and guide supports

Constructing validity: Basic issues in objective scale development.

 EXPORT  Add To My List    Request Permissions  

Database: APA PsycBooks

Chapter

[Clark, Lee Anna](#) [Watson, David](#)

[Review](#) > [Psychol Assess.](#) 2019 Dec;31(12):1412-1427. doi: 10.1037/pas0000626.

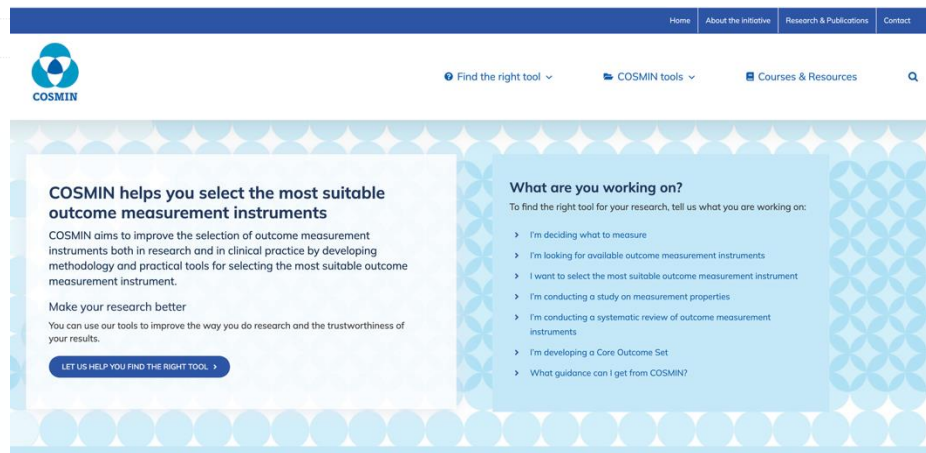
Epub 2019 Mar 21.

Constructing validity: New developments in creating objective measuring instruments

[Lee Anna Clark](#)¹, [David Watson](#)¹

Affiliations 

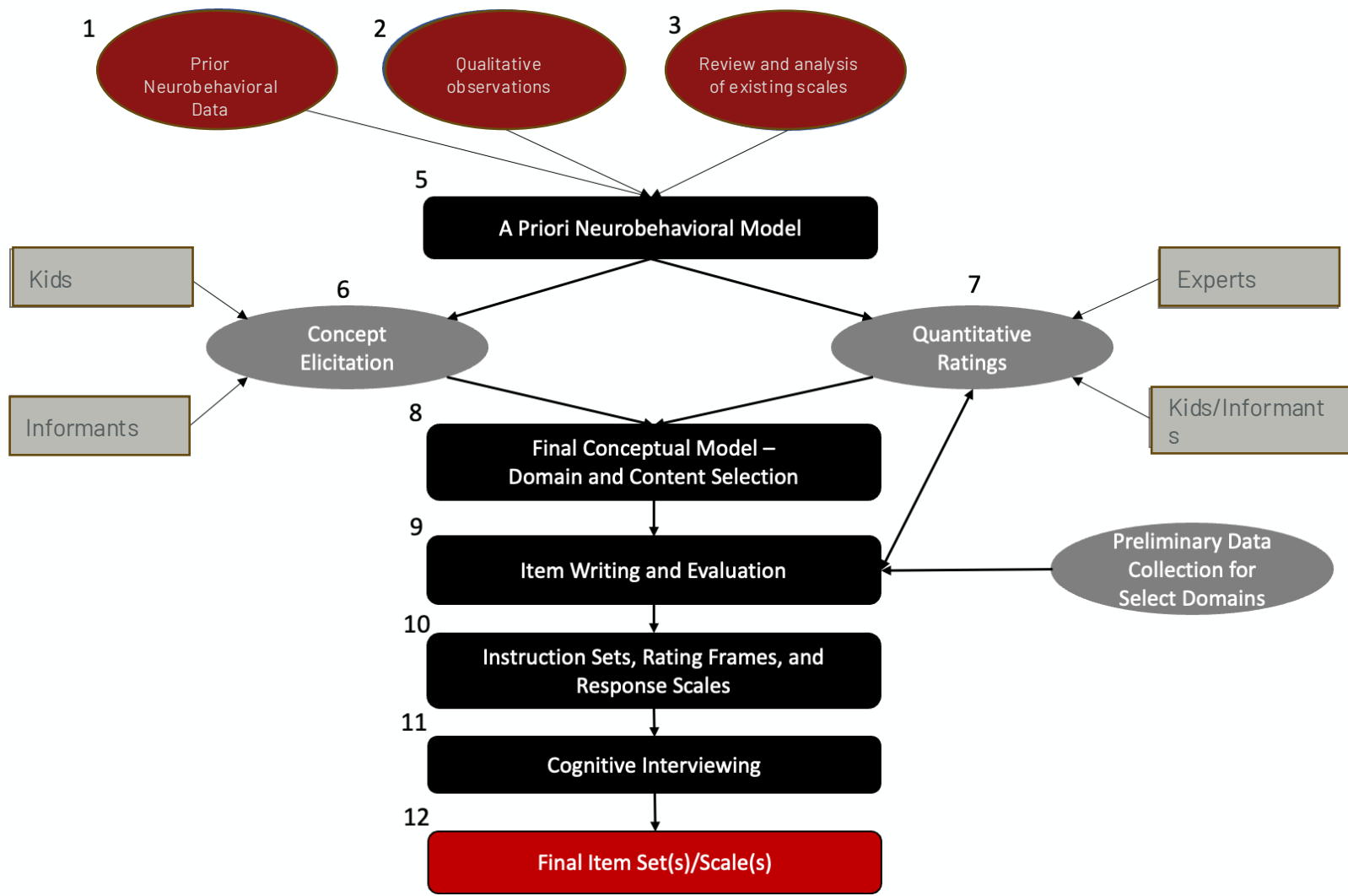
PMID: 30896212 PMCID: [PMC6754793](#) DOI: [10.1037/pas0000626](#)



The screenshot shows the COSMIN website. The header has a navigation bar with links: Home, About the initiative, Research & Publications, and Contact. Below the header is a COSMIN logo. The main content area has a blue background with a pattern of white stars and circles. It features two main sections: 'COSMIN helps you select the most suitable outcome measurement instruments' and 'What are you working on?'. The first section includes a description of COSMIN's mission and a button that says 'LET US HELP YOU FIND THE RIGHT TOOL >'. The second section lists several research questions with expandable arrows.



The screenshot shows the NIH Common Fund website. The header features the NIH logo and the text 'National Institutes of Health Office of Strategic Coordination - The Common Fund'. Below the header is a search bar labeled 'Search Common Fund' with a magnifying glass icon. To the right of the search bar are links for 'Home', 'Sitemap', and 'Subscribe'. Below the search bar is a navigation bar with links: 'Our Programs', 'Research Funding', 'News & Media', 'New Program Planning', 'Evaluation & Assessment', and 'About Us'. Below the navigation bar is a large purple banner with the text 'Patient-Reported Outcomes Measurement Information System (PROMIS)'.



“mania for spinning blocks and pans and other round objects”

“spun with great pleasure anything he could seize upon to spin”

“jumped up and down repeatedly”

“arranged beads, sticks, or blocks in groups of different series of colors”

“most of actions were repetitions carried out in exactly the same way in which they had been performed originally”

“innumerable verbal rituals recurring all day long”

“holds things in hands, takes things to bed with her, repeats phrases, gets stuck on an idea, game, etc., and rides it hard, then goes to something else”

“obsessive interest in motor transports”

“repetition of things he had heard”

“interested in pictures and very soon knew an inordinate number of pictures in a set of Compton’s Encyclopedia”

Kanner (1943)

Autism Spectrum Disorder DSM-5 TR Criteria:

(i) Social communication/interaction

(ii) Restricted and repetitive behavior:

- ✓ Stereotyped or repetitive speech, motor movements or use of objects.
"arranged beads, sticks, or blocks in groups of different series of colors"
- ✓ Excessive adherence to routines, ritualized patterns of verbal or nonverbal behavior, or excessive resistance to change.
"most of actions were repetitions carried out in exactly the same way in which they had been performed originally"
- ✓ Highly restricted interests that are abnormal in intensity or focus.
"innumerable verbal rituals involving all day long"
"holds the ball in her hand for 10 minutes, looking at it with her mouth open, then goes on idea, game, etc., and rides it hard, then goes to something else"
- ✓ Hyper or hypo reactivity to sensory input or unusual interest in sensory aspects of the environment.
"obsessive interest in motor transports"
"repetition of things he had heard"
- ✓ among the earliest infant predictors of later autism diagnosis (Morgan et al., 2008; Wolff et al., 2014)

Kanner (1943)

Echolalia, echopraxia	Flicking objects	Hand-flapping	Spinning, twirling	Rocking
Hair twirling	Whole body stereotypy	Skin-picking, self-touch	Head-banging	Eye-poking
Special skills	Preoccupations with symmetry	Fascination with abstract properties of objects		Imperfections in toys, clothes
Clinging to home	Insistence on same clothes, food, route	Touching, tapping, scratching		Sniffing / shoulder shrugging
Hoarding / collects objects	Focus on minute details	Obsessions	Sameness in routines	Ordering / lining up / arranging objects
Repetitive vocalisations	Studies angles	Elaborate rituals	Manipulates objects	Collects facts
Repetitive questions / themes			Limited self-chosen interests	

Autism Spectrum Disorder DSM-5 TR Criteria:

(ii) Restricted and repetitive behavior:

- ✓ Stereotyped or repetitive speech, motor movements or use of objects.
- ✓ Excessive adherence to routines, ritualized patterns of verbal or nonverbal behavior, or excessive resistance to change.
- ✓ Highly restricted interests that are abnormal in intensity or focus.
- ✓ Hyper or hypo reactivity to sensory input or unusual interest in sensory aspects of the environment.



Study questions DSM-5's combining of autism traits

Sensory traits and restricted and repetitive behaviors are best understood as distinct but related characteristics, the new work suggests.

- ✓ Highly restricted interests that are abnormal in intensity or focus.
- ✓ Hyper or hypo reactivity to sensory input or unusual interest in sensory aspects of the environment.

Autism Diagnostic Interview-Revised (ADI-R)

Repetitive Behavior Scale-Revised (RBS-R)

Repetitive Behavior Questionnaire-2 (RBQ-2)

Behavior and Sensory Interests Questionnaire (BSIQ)



Repetitive (Sensory) Motor Behaviors (RMB; 36/38 studies):

hand and finger mannerisms, repetitive use of objects, stereotyped body movements, sensory related behaviors

Insistence on Sameness (IS; 37/38 studies):

excessive adherence to routines, ritualized patterns of verbal or nonverbal behavior, or excessive resistance to change



Autism Diagnostic Interview-Revised (ADI-R)

Repetitive Behavior Scale-Revised (RBS-R)

Repetitive Behavior Questionnaire-2 (RBQ-2)

Behavior and Sensory Interests Questionnaire (BSIQ)



Repetitive (Sensory) Motor Behaviors (RMB; 36/38 studies):

hand and finger mannerisms, repetitive use of objects, stereotyped body movements, sensory related behaviors

Insistence on Sameness (IS; 37/38 studies):

excessive adherence to routines, ritualized patterns of verbal or nonverbal behavior, or excessive resistance to change

Circumscribed Interests (CI) 13/38 studies):

interests that are unusual in terms of content or intensity



Limited item coverage of existing measures such as ADI-R and RBS-R could impact the ability to identify more fine-grained RRB subdomains

- Cross-measurement factor analyses can enable:
 - ✓ identification of domains that might be under-represented and not adequately captured by the current instruments, and
- In a sample of 16,761 children with autism we conducted cross-measurement exploratory structural equation modelling analysis utilizing item-level data from six different instruments (Uljarević et al., 2021).

Limited item coverage of existing measures such as ADI-R and RBS-R could impact the ability to identify more fine-grained RRB subdomains

- Cross-measurement factor analyses can enable:
 - ✓ identification of domains that might be under-represented and not adequately captured by the current instruments, and
- In a sample of 16,761 children with autism we conducted cross-measurement exploratory structural equation modelling analysis utilizing item-level data from six different instruments (Uljarević et al., 2021).



Repetitive Motor Behaviors

Insistence on Sameness

Compulsions

Self-injurious Behaviors

Sensory Features

Restricted Interests

Unusual Interests

Uljarević et al. Molecular Autism (2021) 12:19

Molecular Autism

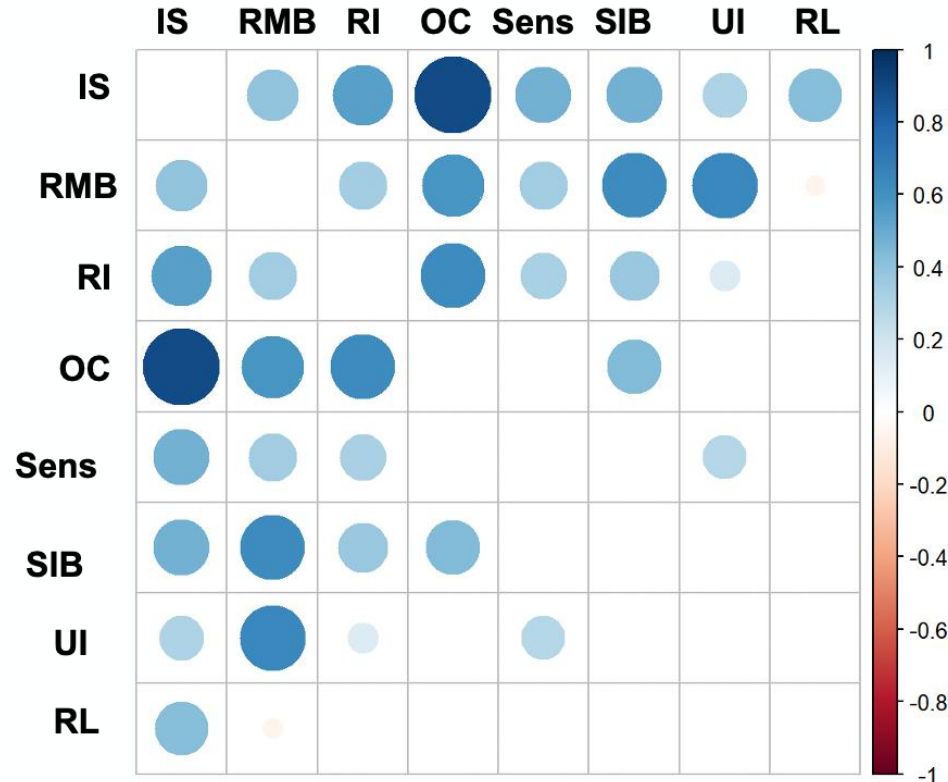
RESEARCH

Open Access

Using the big data approach to clarify the structure of restricted and repetitive behaviors across the most commonly used autism spectrum disorder measures

Mirko Uljarević^{1*}, Boail Jo², Thomas W. Frazier³, Lawrence Scahill⁴, Eric A. Youngstrom⁵ and Antonio Y. Hardan¹

Meta-analytic synthesis of RRB factors across measures and groups



Limited item coverage of existing measures such as ADI-R and RBS-R could impact the ability to identify more fine-grained RRB subdomains

- Cross-measurement factor analyses can enable:
 - ✓ identification of domains that might be under-represented and not adequately captured by the current instruments, and
- In a sample of 16,761 children with autism we conducted cross-measurement exploratory structural equation modelling analysis utilizing item-level data from six different instruments (Uljarević et al., 2021).



Repetitive Motor Behaviors

Insistence on Sameness

Compulsions

Self-injurious Behaviors

Sensory Features

Restricted Interests

Unusual Interests

Stereotyped Language

Uljarević et al. Molecular Autism (2021) 12:19

Molecular Autism

RESEARCH

Open Access

Using the big data approach to clarify the structure of restricted and repetitive behaviors across the most commonly used autism spectrum disorder measures

Uljarević, B., Bösl, J., Thomas, W., Frazier, T., Lawrence, S., Eric, A., Youngstrom, E. and

Current Measures: Are they optimal?

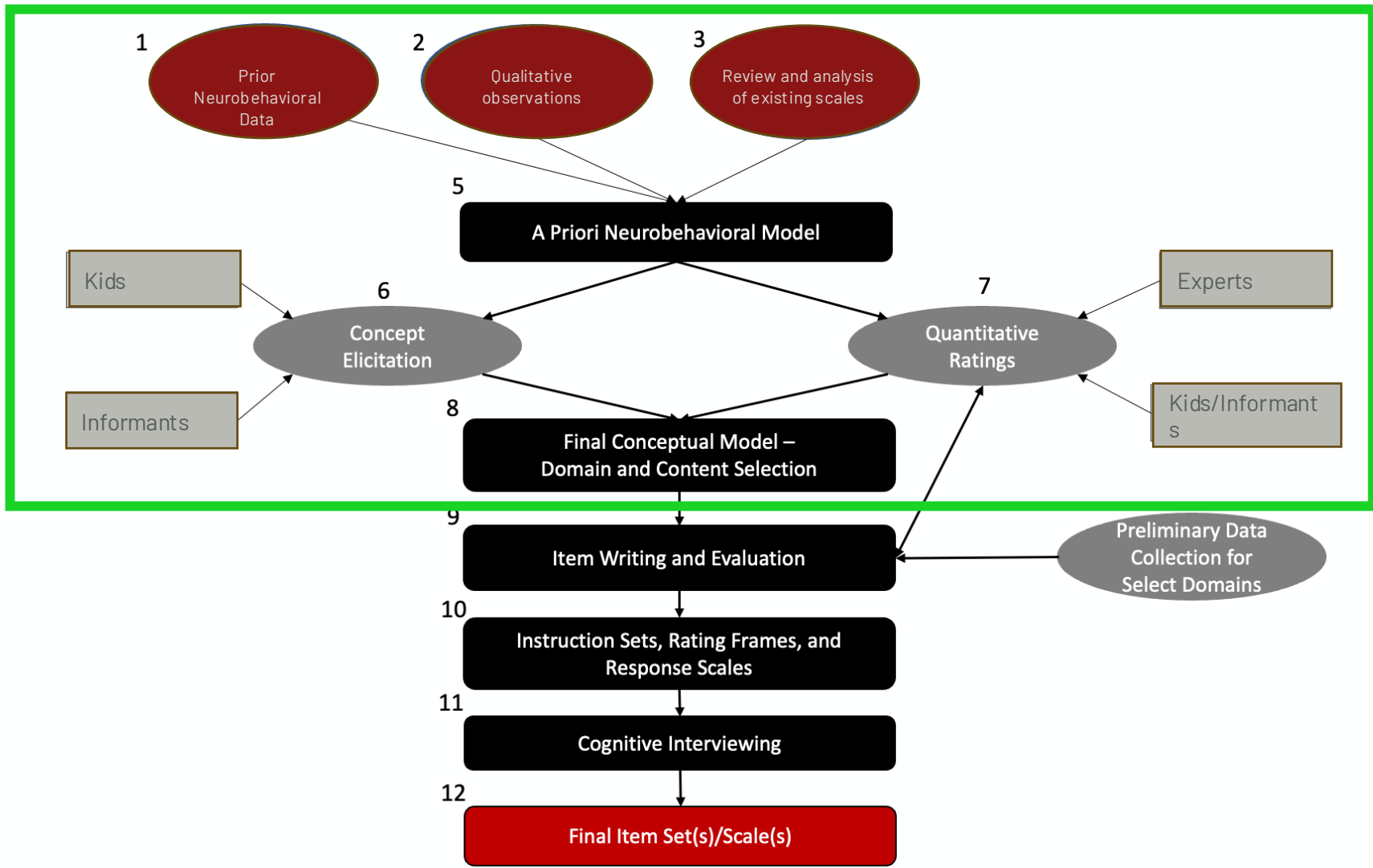
Current instruments

Limited by:

- ✓ poor ability to systematically and comprehensively capture all relevant RRB domains, both in terms of domain representation and domain coverage
- ✓ limited psychometric properties (e.g., lack of evidence for invariance across sex, age, IQ or diagnoses; no measures to date have been normed using modern [regression-based] norming procedures)

RRB domains	General Diagnostic/Screening Instruments			Dedicated RRB measures		
	ADI-R	SRS-2	SCQ	RBS-R	CY-BOCS ASD	RBQ-2
Repetitive Motor Behaviors						
Insistence on Sameness						
Restricted and Unusual Interests						
Sensory sensitivity/features						
Self-injurious Behaviors						
Stereotyped Language						
Compulsions or Obsessions						

Key:  = No Coverage  3-5 items  = 5-10 items  = >10 items



Dimensional Assessment of Restricted and Repetitive Behaviors

Conceptual Model of RRB:

- ✓ Repetitive Motor Behaviors,
- ✓ Insistence on Sameness,
- ✓ Restricted Interests,
- ✓ Unusual Interests,
- ✓ Self-injurious Behaviors,
- ✓ Atypical Sensory Features,
- ✓ Obsessions and Compulsions, and
- ✓ Repetitive Language.

Dimensional Assessment of Restricted and Repetitive Behaviors

Item development:

A comprehensive set of items was developed to capture each of eight identified RRB subdomains.

Concepts guiding item development included:

- ✓ good coverage of the full range of symptom severity and presentations,
- ✓ applicability across the cognitive functioning range, and
- ✓ applicability across the lifespan.

Each domain is represented by ≥ 15 items to allow:

- ✓ in-depth domain coverage,
- ✓ sufficient range to capture change,
- ✓ identification of potential new subdomains, and

Dimensional Assessment of Restricted and Repetitive Behaviors

Expert Review:

Items were reviewed by 40 clinicians and researchers with expertise in RRB and/or measurement development.

Experts reviewed:

- ✓ item clarity,
- ✓ whether any of the potential subdomains were missed, and
- ✓ whether additional items were needed.

Review also provided initial evidence for face validity.

- ✓ No additional subdomains or items were suggested by the experts.
- ✓ Suggested improvements or clarifications of item wording were incorporated.

Dimensional Assessment of Restricted and Repetitive Behaviors

Parental Review:

Refined items were reviewed by 19 parents of children with autism.

Parents reviewed:

- ✓ item clarity, and
- ✓ whether any of the potentially relevant RRB were missed.

Summary:

- ✓ Adjustments were made to 11 items to improve the clarity,
- ✓ two items were removed, and
- ✓ five item (insistence that other people use scripted language when interacting) nominated by four parents was added.

Dimensional Assessment of Restricted and Repetitive Behaviors

Large scale validation:

Parents of 1,892 children and adolescents with autism ($M = 10.82$; $SD = 4.14$; 420 females) recruited from the Simons Foundation Powering Autism Research for Knowledge (SPARK) completed:

DARB,

Repetitive Behavior Scale-Revised (RBS-R),

Repetitive Behavior Questionnaire-2 (RBQ-2),

Sensory Experiences Questionnaire (SEQ),

Parent-rated Anxiety Scale for Youth with Autism (PRAS-ASD), and

Social and Communication Questionnaire (SCQ).

Dimensional Assessment of Restricted and Repetitive Behaviors

Analytical Approach:

© 2000 Ted Goff www.tedgoff.com

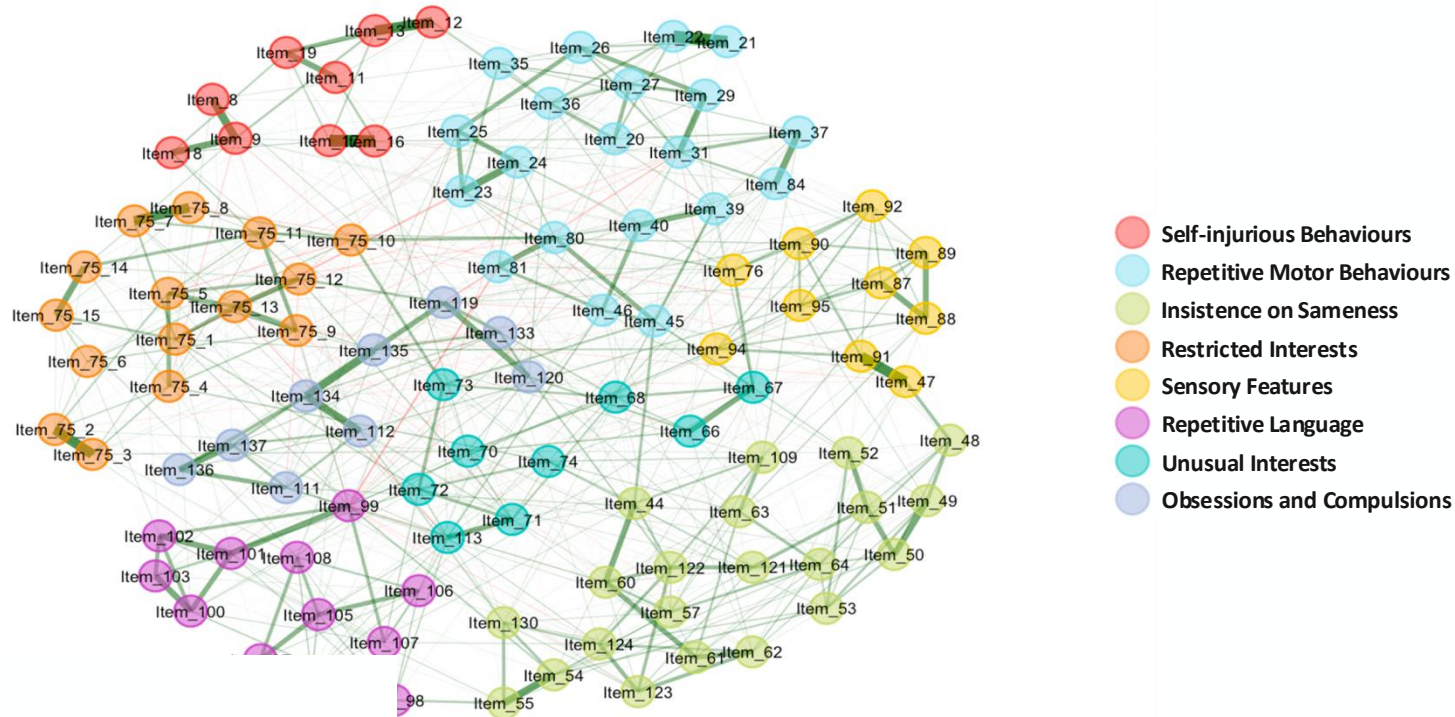


"You're not allowed to use the sprinkler system to keep your audience awake."



Dimensional Assessment of Restricted and Repetitive Behaviors

Factor Structure:



Why should we care?

Psychometrician



Why should we care?

Restricted and repetitive behavior

(DSM-5 TR and ICD-11:

- ✓ Stereotyped or repetitive speech, motor movements or use of objects.
- ✓ Excessive adherence to routines, ritualized patterns of verbal or nonverbal behavior, or excessive resistance to change.
- ✓ Highly restricted interests that are abnormal in intensity or focus.
- ✓ Hyper or hypo reactivity to sensory input or unusual interest in sensory aspects of the environment.

Why should we care?

Restricted and repetitive behavior

(DSM-5 TR and ICD-11:

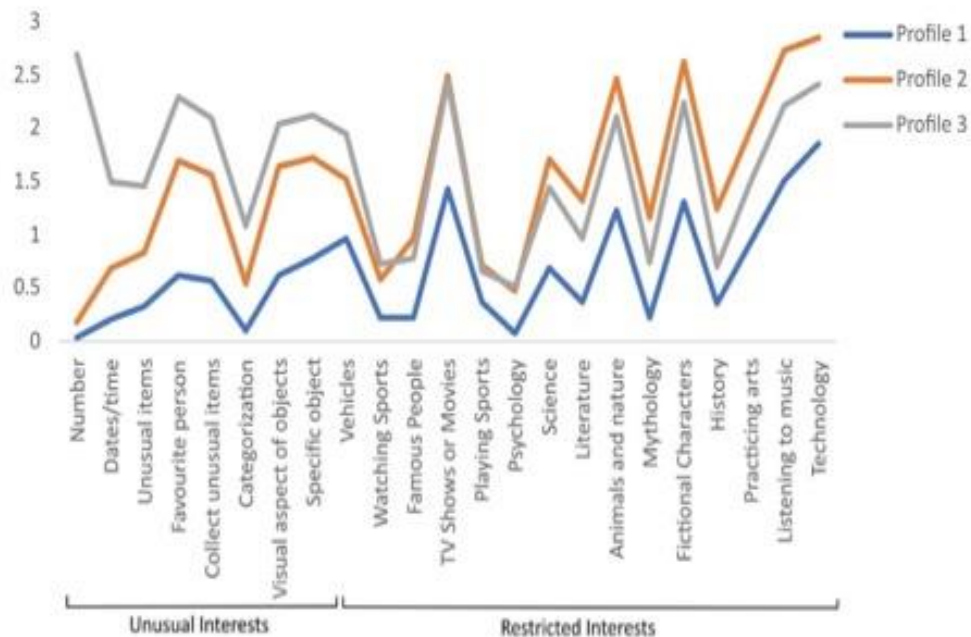
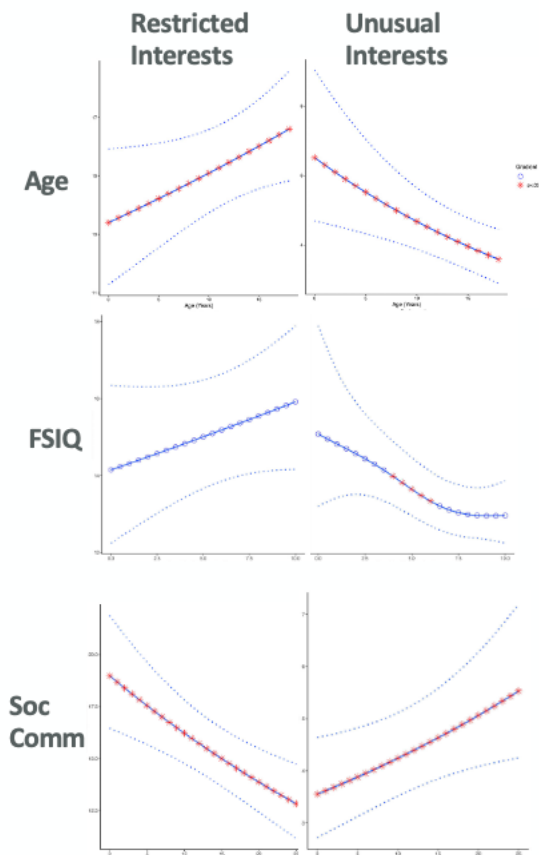
- ✓ Stereotyped or repetitive speech, motor movements or use of objects.
- ✓ Excessive adherence to routines, ritualized patterns of verbal or nonverbal behavior, or excessive resistance to change.
- ✓ Highly restricted interests that are abnormal in intensity or focus.
- ✓ Hyper or hypo reactivity to sensory input or unusual interest in sensory aspects of the environment.



Restricted Interests

Unusual Interests

Why should we care?



RESEARCH ARTICLE | Open Access | CC BY

Characterizing restricted and unusual interests in autistic youth

Emily Spackman^{1,2}, Luke D. Smillie, Thomas W. Frazier, Antonio Y. Hardan, Gail A. Alvares, Andrew Whitehouse, Mirko Uljarević



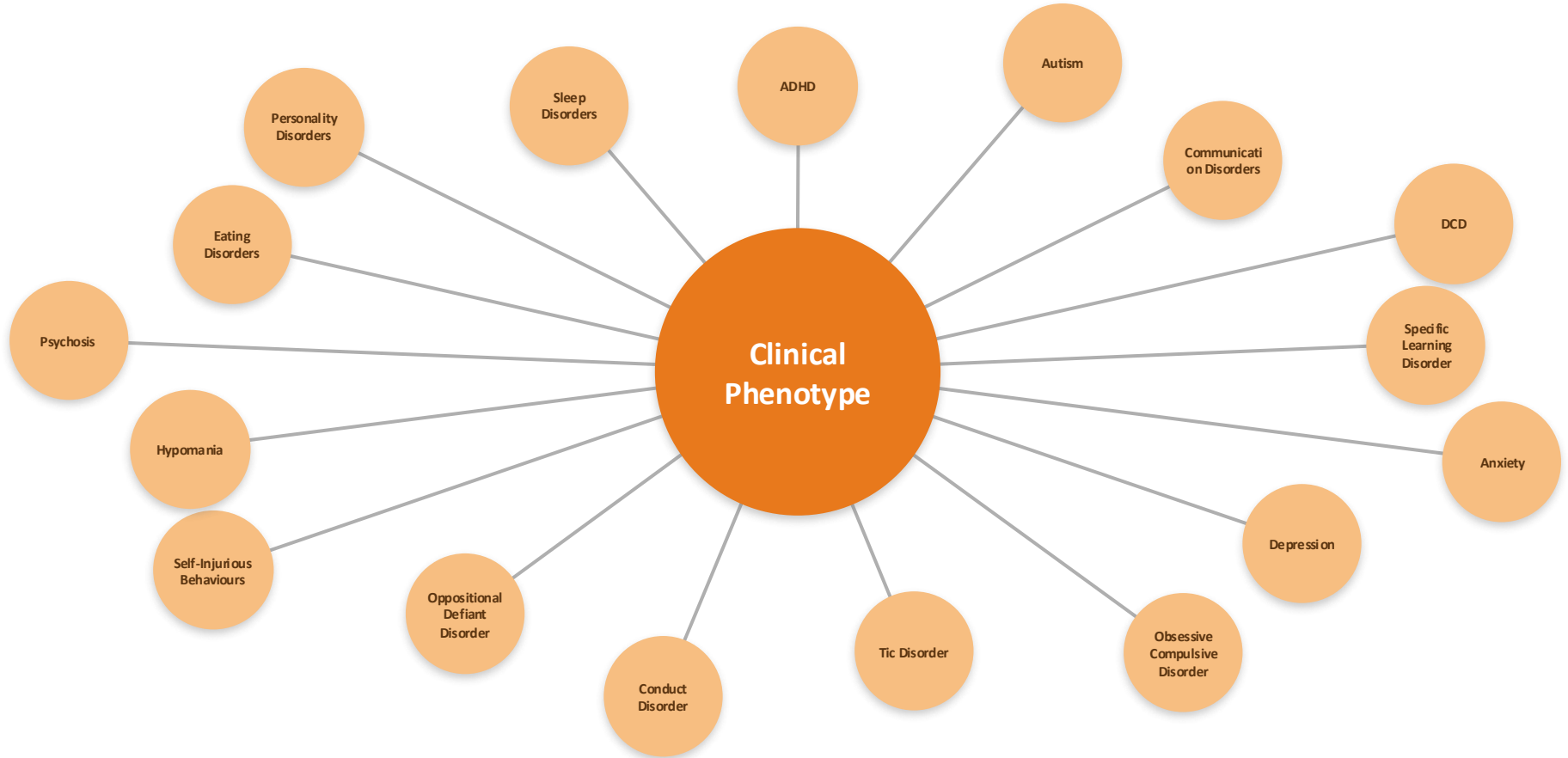
Front. Behav. Neurosci. 2023; 17: 1037967.
Published online 2023 Feb 9. doi: [10.3389/fnbeh.2023.1037967](https://doi.org/10.3389/fnbeh.2023.1037967)

PMCID: PMC9947294
PMID: 36844650

Profiles of circumscribed interests in autistic youth

Emily Spackman^{1,2}, Luke D. Smillie, Thomas W. Frazier, Antonio Y. Hardan, Gail A. Alvares, Andrew Whitehouse, and Mirko Uljarević^{1,3}

Clinical Phenotype



Risk & Resilience Factors



Classical Test Theory (CTT) — Current Practice



Same fixed items → every respondent

Regardless of age, cognitive level, or symptom severity

- Every item is assumed equally informative for every individual
- Parents answer many irrelevant, low-information questions
- A documented source of frustration and stress for families

Classical Test Theory (CTT) — Current Practice

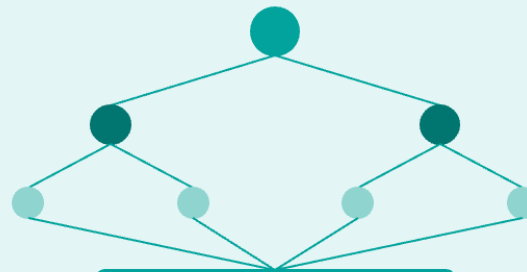


Same fixed items → every respondent

Regardless of age, cognitive level, or symptom severity

- Every item is assumed equally informative for every individual
- Parents answer many irrelevant, low-information questions
- A documented source of frustration and stress for families

Computerised Adaptive Testing (CAT) — The Fix



A tailored item sequence per person

Calibrated item bank adapts to the individual, in real time

- Only the most relevant items are selected and administered
- Item choice reflects each person's specific characteristics
- Simultaneously ↑ precision and ↓ respondent burden

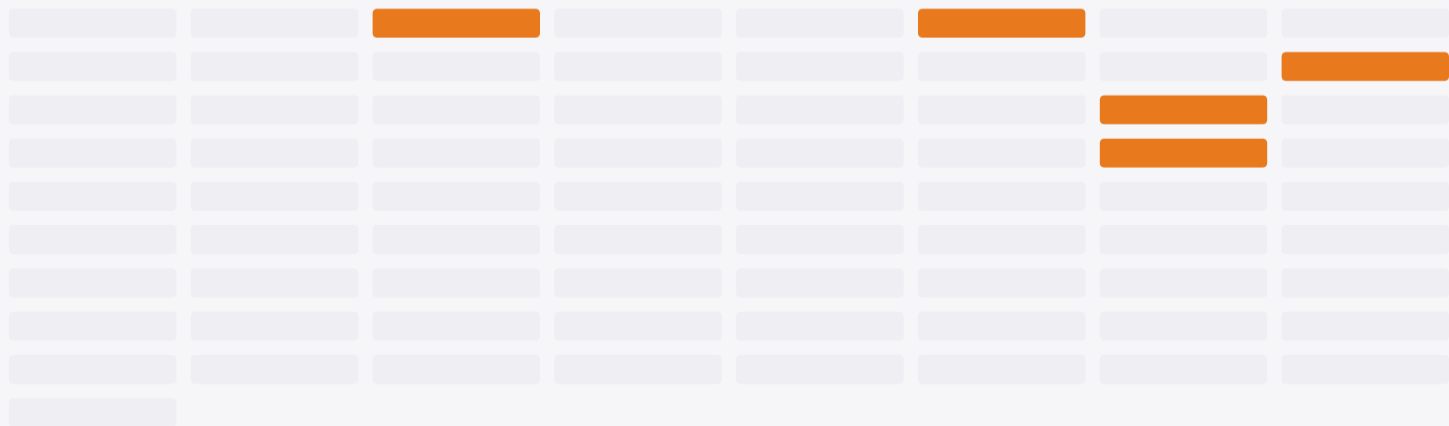
Traditional Fixed-Form Measure

Every respondent answers all 73 items, regardless of relevance

73 items → same length questionnaire for everyone

Computerized Adaptive Testing (CAT)

Each new item is chosen based on the person's previous answers



Only the most informative items are administered

Item 1 • Inattention subscale (CAT-selected)

Has difficulty staying on task

Never/
Almost Never

Rarely

Sometimes

Often

Very Often

Ability Estimate (Inattention θ)

$\theta = +0.00$



Stopping rule: $SE \leq 0.30$

$SE = 1.00$

Items administered: 0

No items answered yet

Item 1 • Inattention subscale (CAT-selected)

✓ Answered: Often

Has difficulty staying on task

Never/
Almost Never

Rarely

Sometimes

Often

Very Often

Ability Estimate (Inattention θ)

$\theta = +0.60$



Stopping rule: $SE \leq 0.30$

SE = 0.65

Items administered: 1

1. Has difficulty staying on task

Often

Item 2 • Inattention subscale (CAT-selected)

**Finds it difficult to follow instructions,
especially when there are multiple steps**

Never/
Almost Never

Rarely

Sometimes

Often

Very Often

Ability Estimate (Inattention θ)

$\theta = +0.60$



Stopping rule: $SE \leq 0.30$

$SE = 0.65$

Items administered: 1

1. Has difficulty staying on task

Often

Item 2 • Inattention subscale (CAT-selected)

✓ Answered: Very Often

**Finds it difficult to follow instructions,
especially when there are multiple steps**

Never/
Almost Never

Rarely

Sometimes

Often

Very Often



Ability Estimate (Inattention θ)

$\theta = +1.10$



Stopping rule: $SE \leq 0.30$

$SE = 0.48$

Items administered: 2

1. Has difficulty staying on task

Often

2. Finds it difficult to follow instructions...

Very Often

Item 3 • Inattention subscale (CAT-selected)

Avoids tasks that require sustained attention for long periods of time

Never/
Almost Never

Rarely

Sometimes

Often

Very Often

Ability Estimate (Inattention θ)

$\theta = +1.10$



Stopping rule: $SE \leq 0.30$

$SE = 0.48$

Items administered: 2

1. Has difficulty staying on task

Often

2. Finds it difficult to follow instructions...

Very Often

Item 3 • Inattention subscale (CAT-selected)

✓ Answered: Often

Avoids tasks that require sustained attention for long periods of time

Never/
Almost Never

Rarely

Sometimes

Often



Very Often

Ability Estimate (Inattention θ)

$\theta = +1.30$



Stopping rule: $SE \leq 0.30$

SE = 0.38

Items administered: 3

1. Has difficulty staying on task

Often

2. Finds it difficult to follow instructions...

Very Often

3. Avoids tasks that require sustained atten...

Often

Item 4 • Inattention subscale (CAT-selected)

Has a short attention span for their age

Never/
Almost Never

Rarely

Sometimes

Often

Very Often

Ability Estimate (Inattention θ)

$\theta = +1.30$



Stopping rule: $SE \leq 0.30$

SE = 0.38

Items administered: 3

1. Has difficulty staying on task

Often

2. Finds it difficult to follow instructions...

Very Often

3. Avoids tasks that require sustained atten...

Often

Item 4 • Inattention subscale (CAT-selected)

✓ Answered: Very Often

Has a short attention span for their age

Never/
Almost Never

Rarely

Sometimes

Often

Very Often



Ability Estimate (Inattention θ)

$\theta = +1.45$



Stopping rule: $SE \leq 0.30$

SE = 0.31

Items administered: 4

1. Has difficulty staying on task

Often

2. Finds it difficult to follow instructions...

Very Often

3. Avoids tasks that require sustained atten...

Often

4. Has a short attention span for their age

Very Often

Item 5 • Inattention subscale (CAT-selected)

Struggles to concentrate in busy and/or noisy environments

Never/
Almost Never

Rarely

Sometimes

Often

Very Often

Ability Estimate (Inattention θ)

$\theta = +1.45$



Stopping rule: $SE \leq 0.30$

SE = 0.31

Items administered: 4

1. Has difficulty staying on task

Often

2. Finds it difficult to follow instructions...

Very Often

3. Avoids tasks that require sustained atten...

Often

4. Has a short attention span for their age

Very Often

Item 5 • Inattention subscale (CAT-selected)

✓ Answered: Often

Struggles to concentrate in busy and/or noisy environments

Never/
Almost Never

Rarely

Sometimes

Often

Very Often

Ability Estimate (Inattention θ)

$\theta = +1.40$



Stopping rule: $SE \leq 0.30$

$SE = 0.27$

Items administered: 5

2. Finds it difficult to follow instructions...

Very Often

3. Avoids tasks that require sustained atten...

Often

4. Has a short attention span for their age

Very Often

5. Struggles to concentrate in busy and/or n...

Often

Stopping rule met

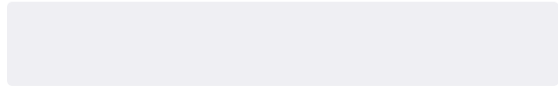
$SE = 0.27 \leq 0.30 \rightarrow$ precision target reached

The algorithm stops administering items automatically

Result

Items administered

Fixed form



37

CAT



5

86% fewer items

for the same measurement precision

Final ability estimate

Ability Estimate (Inattention θ)

$\theta = +1.40$



Stopping rule: $SE \leq 0.30$

SE = 0.27

Inattention T-score ≈ 64

Based on the gold standard measurement development and validation recommendations, detailed item banks (> 3,500 items) to assess capture autism symptoms and symptoms that characterise other child-onset neurodevelopmental and neuropsychiatric conditions.

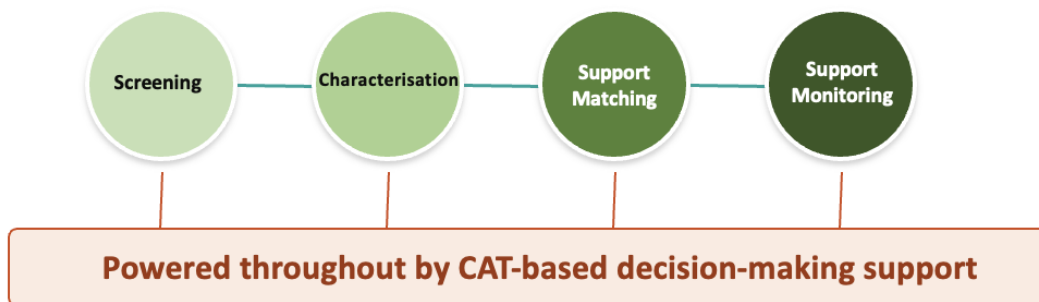
Comprehensive with state-of-the-art norms

Remote & Scalable

Reduced Wait Times

Lower Cost & Inefficiency

First concern-to-individually-tailored supports pathway



Comprehensive characterisation • Repeated, remote administration • Scalable, time- and cost-efficient assessment

A paradigm shift toward scalable, Person-centered, measurement-based, evidence-based assessment driven care

Bring the infrastructure needed to make evidence-based, personalised, measurement-based assessment the national default rather than the exception.

Thank you