DEVELOPING THE DOWN SYNDROME REGRESSION RATING SCALE

Cognitive Interview Findings and Caregiver Perspectives

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Introduction

Down Syndrome Regression Disorder (DSRD) causes devastating declines in cognition, adaptive functioning, and mood in adolescents and young adults with Down syndrome (DS). Existing assessments rely on costly, specialist-driven evaluations that are inaccessible to most families. A low-burden, caregiver-reported measure is urgently needed to support screening, monitoring, and large-scale research. This poster presents qualitative findings from two rounds of cognitive interviews.

Objective

- Document the item development process across two rounds of cognitive interviewing.
- Characterize clinician–caregiver differences in symptom relevance assessment.
- Identify phenomenological descriptions that contextualize the DSRD experience.

Methodology

21 participants (8 healthcare providers, 13 parents) recruited from DS organizations and clinical networks. Two rounds of 90-minute cognitive interviews via Zoom using a modified Delphi approach.

Round 1 (44 items) focused on item wording and relevance.
Round 2 (47 items) elicited phenomenological descriptions of how symptoms manifest.

Caregivers rated each item for clarity and relevance on a 4-point scale; **Content Validity Index** (CVI) was calculated as the proportion rating ≥3, with ≥0.80 as the acceptance threshold.

835 open-ended comments were coded using a two-axis system:
Structural codes (feedback about the measure: wording, relevance, scale).
Phenomenological codes (what comments reveal about the DSRD experience: symptom presentation, onset, course, severity, differential diagnosis, emotional impact).

Key Sources & Acknowledgements

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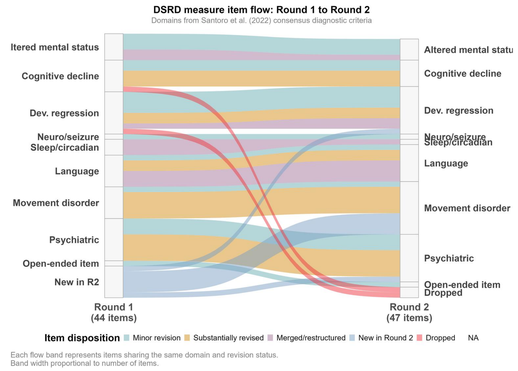
Santoro, J. D., et al. (2022). Assessment and Diagnosis of Down Syndrome Regression Disorder: International Expert Consensus. Frontiers in Neurology, 13, 940175.
Santoro, S. L., et al. (2020). Unexplained regression in Down syndrome: 35 cases from an international Down syndrome database. Genetics in Medicine, 22, 767–776.



Items Changed from Round 1 to Round 2

Figure 1 displays the flow of items from Round 1 (44 items) to Round 2 (47 items), organized by Santoro et al. (2022) consensus symptom clusters. Flow bands are colored by disposition and sized proportionally to item count.

- Most items were retained with minor revisions (n = 16), primarily adding a **"new or increased" stem to standardize around change from baseline**.
- Fifteen items were substantially revised to improve observability and add concrete behavioral examples drawn from respondent feedback.
- The Language cluster underwent the most structural change: five communication items were restructured into seven less speech-centric items encompassing sign language and AAC use.
- The Movement disorder cluster nearly doubled (5 to 10 items), with four new items capturing catatonic features respondents identified as central to DSRD.
- Three sleep items were merged into one, two eating items were consolidated, and two items were dropped due to overlap or questioned relevance.

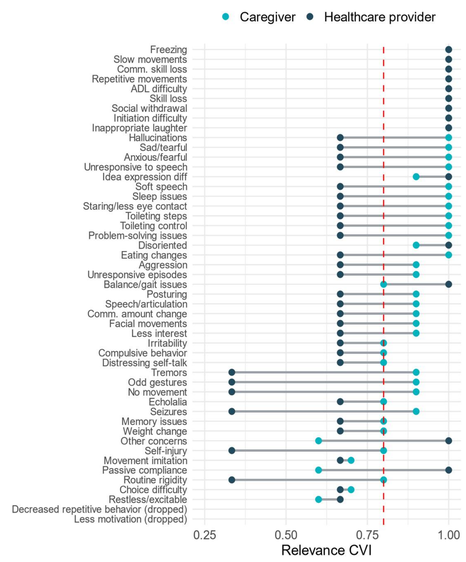


Figure 2. Relevance to DSRD by Respondent Type. CVI = Content Validity Index. Proportion of respondents who rated item "relevant" or "very relevant" to DSRD.

Parents and Clinicians Offered Unique Perspectives

Most Discrepant Questions	Clinician Perspective	Parent Perspective
17. Had new or increased difficulty dealing with changes in routines?	Commonly seen in people with DS plus ASD [R2-177]; In general pop of DS this symptom is common [R2-176]	If plans change, yelling, screaming, no reasoning, total shutdown. Motionless, won't move or cooperate. [R2-180]
46. Had new or increased self-injurious behaviors for example, head-banging, hitting themselves with hand or object, biting or scratching self, or hair pulling?	Have not seen this as much [R2-460]; Trauma? Depression? Catatonia? [R2-461]	He would hit himself in the face, making himself bleed and bruise. [R2-466]; When there was a change in routine, she would ball up her fists and hit herself on the legs and head. [R2-465]
19. Had new or increased seizures or suspected seizures?	Why is this considered something related to DSRD? [R2-201]; Haven't seen a lot but is reported [R2-202]	A lot of seizures and suspected seizures. One of the first symptoms that they see for regression disorder. Did for our son but weren't able to prove it was a seizure. [R2-205]; He had to be hospitalized 2 or 3 times because of an event that seemed like a seizure. Had multiple EEGs but showed no seizure activity. [R2-203]
29. Had new or increased periods of time without moving?	Catatonia? Not related to DSRD. [R2-305]	With regression he has lost about 80% of his ability to initiate things. Without initiation he doesn't seem to want to do much. [R2-309]; At bedtime, would just sit and stare off. Or would get up and just stand, like she's forgotten what to do—what's next. [R2-307]
34. Had new or increased difficulty walking, keeping their balance, going up or down stairs, or walking through doorways?	Capturing the hesitation individuals may feel. Maybe add 'hesitation.' [R2-348]; Catatonia presentation? This would suggest treatment with lorazepam [R2-349]	Fell and broke her ankle walking down the street. Like depth perception is gone. Will bounce off door frames. [R2-352]; Height of catatonia, going through doorways was very difficult. Physical transitions required a lot of support. [R2-354]
30. Had new or increased passivity, doing things and going places without any objection or hesitation, even things they might have previously resisted?	More likely because they are checked out. Not because they don't care. [R2-313]; Passivity may be a word some people might not understand. [R2-314]	Could drag her anywhere. Did not last long. [R2-316]; Minimal agency [R2-318]; He was always compliant before regression. He was more resistant after regression. [R2-315]
7. Had new or increased difficulty expressing preferences or choices (for example, deciding what to wear, what to eat, where to go, etc)?	Maybe a peripheral change. Not that they don't care but they are not able to process what is going on. [R2-064]	She used to have an opinion about where she wanted to eat, but now she says she doesn't care. [R2-075]; Catatonia muted his agency [R2-072]; Would get blank stare or she would say 'I don't know.' [R2-069]
41. Had new or increased periods where they were unresponsive to their surroundings?	Seems repetitive from the group of catatonia questions [R2-413]; Catatonia? [R2-412]	When they're not responding or wanting to move for long periods of time, affects so much of their day. Have heard people talk about losing their loved one, would describe it like this. People become shell of themselves, loses personality, loses their spark. [R2-416]
6. Had less interest or excitement in things they would typically enjoy?	Catatonia? Not related to DSRD. [R2-305]	Always been really social, involved in all types of activities. Would sing songs in the car, do makeup tutorials. Had zero interest in these things. No interest in shopping, Costco food court, church. Just would be in her room with her door shut. [R2-058]; Probably one of the more impactful and stressful items for family. When losing joy of doing what they love. Affects the entire family, very emotional, very hard to see. [R2-059]
36. Had new or increased tremors or trembling of their hands, legs, or eye movements?	I would maybe call for a medical workup. [R2-368]; Catatonia? [R2-369]	Daughter has been having leg spasms while sleep that are exactly 9-10 sec apart. Maybe add in the question if loved one is sleep or awake. [R2-372]; He had abnormal eye movements where his eyes went to the side and up [R2-370].

Conclusion

Caregivers consistently rated symptom relevance higher than clinicians, particularly for catatonia-related items, self-injury, and seizures. Qualitative data revealed these discrepancies reflect different explanatory frameworks rather than simple disagreement. Clinicians often attributed symptoms to baseline DS or other conditions, while caregivers described qualitative shifts they recognized as regression. It will be important for the DSRRS to make clear to clinicians that **endorsement represents signifcant change from baseline.**
The DSRRS is designed to capture both clinical and caregiver-observed features to support comprehensive DSRD assessment. The forthcoming large-scale data collection (Aim 2; n = 400) will establish the factor structure and provide an empirical test of the domain hypotheses generated during this qualitative work.

Limitations & Future Directions

Round 2 comments were disproportionately from caregivers (358 vs. 114 clinician comments). Initial coding pass completed by single coder. Multiple coders and interrater reliability planned for the full publication. The cognitive interview sample was not designed to be representative of all DSRD experiences. A full-length manuscript is in preparation. Next steps include large-scale data collection, factor analysis, and sensitivity/specificity analyses.