



Divergent Developmental Trajectories in ASD: The Necessity of Targeted, Individualistic Pedagogical Interventions for Twin Learners

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Abstract: Modern education is increasingly focused on inclusivity. This shift is evidenced by both evolving nomenclature – moving from deficit-based language (like “autistic child”) to person-first perspectives (like “child with autism”) – and the structural integration of inclusive wings in schools which are designed to support learners with diverse abilities and needs. Autism Spectrum Disorder (ASD) can be characterised by a broad range of challenges in social interaction, communication, and repetitive behaviors, and sits at the center of this pedagogical evolution. However, a persistent “one-size-fits-all” assumption exists in special education, where interventions successful for one student with ASD are automatically assumed to be universally applicable. While foundational strategies, such as minimizing sensory overload, provide a necessary and basic starting point to educators, they often fail to address the profound individual differences prevalent within the spectrum. This study challenges the efficacy of generalized support by examining the divergent learning profiles of a set of twins with ASD. In the study, we discuss how despite sharing identical familial environments and educational exposure, the twins’ distinct cognitive and behavioral trajectories highlight a critical need for targeted, individualistic pedagogical interventions.

Keywords: inclusivity, Autism Spectrum Disorder, ASD, individual differences, divergent learning profiles, twins, targeted pedagogical interventions.

1. INTRODUCTION

In recent years, the outlook of modern education has undergone a transformative shift towards inclusivity. This evolution is visible not only in school architecture – with the rise of specialized inclusive wings designed for diverse learners – but also in the language we now use. A transition from deficit-based labels to person-first perspectives (like saying “a child with autism” instead of “an autistic child”) has been noticed recently. This simple yet effective modification in our behaviour implies a shift in the societal perspective regarding inclusion.

At the heart of this shift lies Autism Spectrum Disorder (ASD). ASD is a complex neurodevelopmental condition, characterised by a broad range of challenges in communication, social interaction, as well as repetitive behaviors. Despite the progress made in accommodating these students, a significant challenge remains: the persistent “one-size-fits-all” assumption. In most – if not all – special education settings, there exists an underlying belief that an intervention or pedagogical strategy successful for one ASD student will bear identical results or be successful for another.

While foundational strategies, like reducing sensory stimuli or providing visual schedules, offer a necessary baseline for educators, they often fail to take into account the one thing that makes us all unique – our individual differences. A strategy that provides clarity for one learner may be entirely ineffective, or even counterproductive, for another.

This study seeks to challenge the efficacy of generalised support frameworks by providing a closer look at the divergent learning profiles of a set of twins with ASD. By examining two individuals who share identical familial environments and educational exposure, this research highlights how their divergent cognitive framework and behaviours require interventions beyond the basic – individualised pedagogical interventions. Ultimately, this paper advocates for a shift away from the “one-size-fits-all” approach, in favor of targeted, individualistic pedagogical interventions that respect and nurture the uniqueness and individual needs of each learner.

2. Objective

The primary objective of this study is to investigate the divergence in learning profiles and developmental trajectories of twins diagnosed with Autism Spectrum Disorder (ASD) within a shared educational environment.

3. Theoretical Framework

This study is grounded in the Theory of Differentiated Instruction (DI) by Carol Ann Tomlinson. This theory supports the proposition that teachers must actively modify the curriculum, teaching methods, methodologies, teaching-learning resources according to each learner’s diverse needs and abilities (Tomlinson, 2014).

4. Literature Review

In the research entitled “School Psychologists: Making Inclusion a Reality for All”, Farrell (2004) argues that true inclusion is about much more than just putting students with special educational needs into a regular classroom. He argues that for inclusion to actually work, schools need to focus on making sure that these students are present, accepted by others, participating in activities, as well as actually achieving progress. Finally, he states that a good school is one that is naturally inclusive - where strong leadership and flexible teaching styles ensure that every student succeeds without bringing down the academic bar for others.

In “Inclusion and Integration on Special Education”, Rodriguez & Garro-Gil (2015) discuss that for inclusive education to be effective, it must move beyond simple integration. Instead, there must be a complete cultural shift within the school. The research concludes that inclusion is not a finished project but a continuous process of school improvement.

The research entitled “Quantitative analysis of heterogeneity in academic achievement of children with autism” (Chen et al., 2018) talks about how children with Autism learn in different ways, showing that the Autism spectrum includes a wide variety of academic strengths as well as weaknesses. During this research, it was discovered that being good at math didn’t always mean being good at reading. It also revealed that these skills often don’t match a child’s IQ. By identifying these unique patterns, this study proves that because every student with Autism processes information differently, they need personalized teaching strategies rather than a one-size-fits-all approach.

In “Strategies in supporting inclusive education for autistic students—A systematic review of qualitative research results”, Petersson-Bloom and Holmqvist (2022) talk about the role of classroom adaptations and teacher-led modifications in creating successful inclusive environments for students with Autism. The research successfully highlights that effective instruction for students with Autism depends on moving away from a uniform curriculum and instead utilizing differentiated strategies, such as environmental adjustments and individualized learning supports. By highlighting the necessity of tailoring teaching methods to meet the specific social and cognitive needs of each student, the paper emphasizes that differentiated instruction is not just a secondary support, but a fundamental requirement for ensuring that autistic learners can meaningfully participate and succeed in general education settings.

The research entitled “Teaching learners with autism in the South African inclusive classroom: Pedagogic strategies and possibilities” (Nthibeli et al., 2022) emphasizes the importance of differentiated instruction in inclusive classrooms. It stresses specifically on how pedagogic strategies like scaffolding, visual aids, and individual task modification support students with Autism Spectrum Disorder (ASD). The research discusses that because learners with Autism possess unique cognitive profiles and varying levels of social-communication needs, a standardized one-size-fits-all teaching approach often leads to exclusion. By implementing differentiated methods, teachers can effectively address the diverse learning paces and sensory requirements of these students, ultimately creating an environment that fosters both academic progress and social participation for children on the ASD spectrum.

5. Research Gap

Current special education practices often believe in a “one-size-fits-all” bias, assuming that interventions or approaches successful for one student with ASD will be universally applicable and effective for the rest. While existing literature acknowledges the spectrum’s diversity, there is a lack of comparative research involving twins with ASD, requiring individualised support. This study addresses the gap by highlighting how identical exposure to specialised support still results in divergent pedagogical needs, challenging the efficacy of generic inclusivity strategies.

6. Methodology

This study employs a Qualitative and Quantitative research design. It utilizes both open-ended interviews with the educators, as well as the use of a standardised test, namely Sensory Profile 2 - School Companion, to collect the required data.

Sample

A set of twins with a confirmed ASD diagnosis, enrolled in the same educational setting.

Tools

1. **Educator Interviews (Structured, Open-ended):** Qualitative tool focusing on baseline observations, environmental triggers, and pedagogical responsiveness.
2. **Standardised Sensory Profile 2 School Companion by Winnie Dunn:** Quantitative tool focusing on students’ sensory processing patterns.

Inclusion Criteria

A set of twins with a confirmed ASD diagnosis, enrolled in the same educational setting, with consistent access to the same specialized support team (educationists, Occupational Therapist, Behavioural Therapist, Speech Therapist) were included as sample for this study.

Rationale

The rationale for this study centers on the fact that while modern schools have adopted inclusive wings and updated their terminology, the actual pedagogical application often remains generic. This study serves as a necessary call to action for educators and policymakers to move beyond basic accommodations and toward deeply individualized pedagogical interventions. It argues that true inclusivity is not just about physical presence in a classroom, but about the surgical precision of teaching methods tailored to the specific cognitive profile of each learner.

Data Representation

Chart 1: Twin A’s Sensory Profile

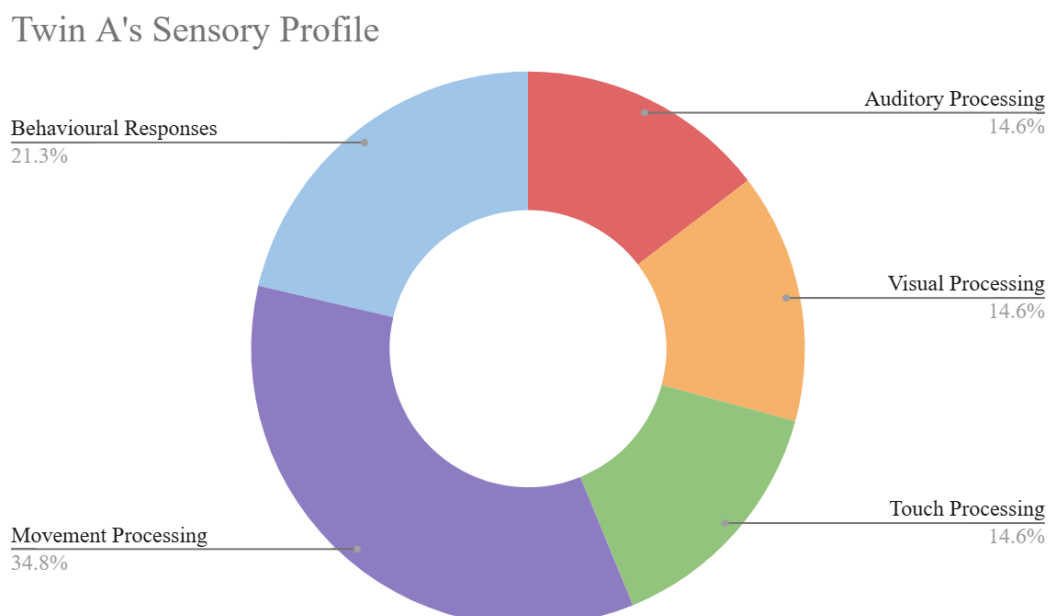
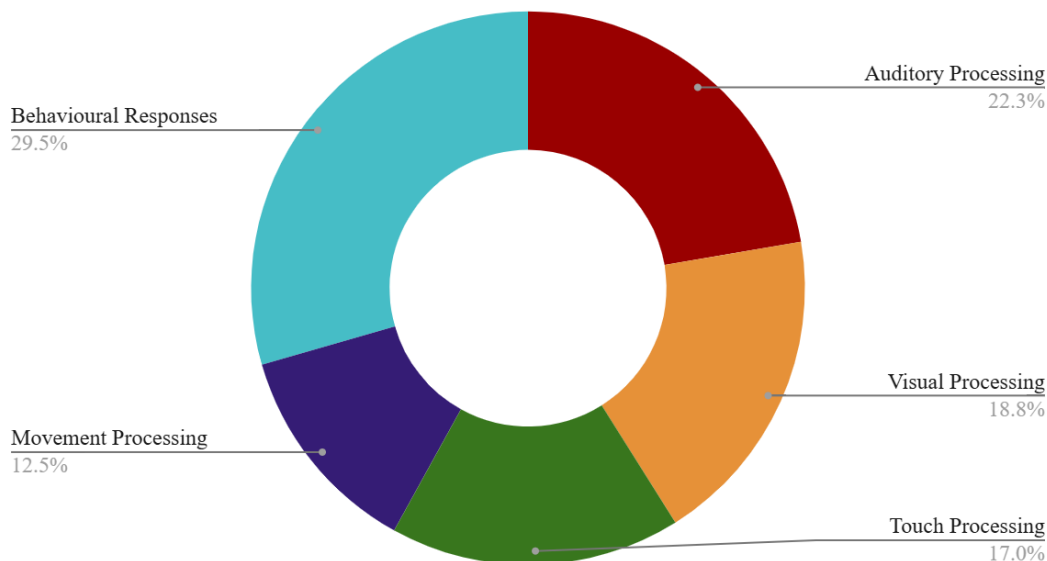


Chart 2: Twin B's Sensory Profile

Twin B's Sensory Profile



Data Interpretation

Chart 1 (Twin A's Sensory Profile)

This chart highlights the distribution of sensory processing categories for Twin A, identifying Movement Processing as the primary area of impact.

- **Movement Processing (purple):** This is the largest section of the chart at 34.8%, indicating that movement-related stimuli are the most significant sensory factor for this child.
- **Behavioral Responses (light blue):** Representing 21.3%, this shows a significant impact on how the child reacts behavior-wise to the surrounding environment.
- **Auditory, Visual, and Touch Processing (red, orange, green):** These three sections are identical at 14.6% each, suggesting a balanced but moderate impact across these basic sensory inputs.

Chart 2 (Twin B's Sensory Profile)

This chart categorizes the sensory impact areas for Twin B, showing a more distributed profile with a primary focus on Behavioral Responses.

- **Behavioral Responses (teal):** The largest portion at 29.5%, indicating that behavioral manifestations are the leading indicator of this child's sensory experience.
- **Auditory Processing (dark red):** At 22.3%, this represents a significant area of impact, suggesting a high sensitivity to sound compared to Twin A.
- **Visual Processing (dark orange):** A moderate-sized section at 18.8%, showing a notable effect on how visual information is managed.
- **Touch Processing (dark green):** At 17.0%, this indicates a consistent impact from tactile stimuli.
- **Movement Processing (dark purple):** Unlike Twin A, this is the smallest section for Twin B at only 12.5%.

The data reveals an inverse relationship between the two twins regarding their primary sensory challenges. While Twin A is primarily impacted by Movement Processing (34.8%), this same category is the least impactful for Twin B (12.5%). Conversely, Twin B shows a much higher sensitivity to Auditory Processing (22.3%) than Twin A (14.6%).

This divergence in the profiles of the twins supports the objective of this study that even individuals with identical backgrounds and diagnoses can exhibit vastly different sensory trajectories, and therefore require targeted, individualistic pedagogical interventions. For example, these charts and their analyses indicate that Twin A requires

more kinesthetic engagement and movement-based breaks, whereas Twin B requires a more controlled auditory environment and behavioral regulation strategies.

7. Discussion & Analysis

The comparative analysis of the twins reveals a significant divergence in sensory processing patterns, despite their shared genetic background and identical educational environment. Twin A's profile is characterized by a 'sensory seeking' nature dominated by movement processing, where she scores the highest, indicating she is almost always on the go and requires high levels of physical input to maintain engagement. In contrast, Twin B demonstrates a 'sensory sensitive' profile with significant challenges in behavioral and auditory domains, scoring 33 and 25 respectively. This contrast highlights that while Twin A seeks out stimulation, Twin B is frequently over-stimulated by loud noises and remains highly inflexible with respect to changes in her routine.

These findings highlight the limitations of standard, generalised inclusive protocols that treat learners with diverse needs and abilities as a homogeneous group. The data shows that Twin A experiences her greatest impact in movement processing, whereas Twin B is primarily impacted by behavioral responses. Such a profound contrast within the same family provides empirical evidence that pedagogical strategies must be transitionally tailored to the individual. A "one-size-fits-all" approach, such as a uniformly quiet and still classroom, might support Twin B's auditory and behavioral needs but would simultaneously fail to provide the kinesthetic stimulation essential for Twin A's learning.

8. Suggestions & Implications for Educational Policies/ Practices

To move beyond general inclusion, educators need more than just awareness. The findings from this paper will help educators in moving beyond just general inclusion towards a more individualistic pedagogy, where educational resources are modified accordingly for different learners:

- Policies should mandate specialized training in Differentiated Instruction (DI) involving long-term mentorship programs where teachers learn to analyze learner profiles, rather than just attend a one-time workshop.
- Schools should invest in adaptive learning platforms that personalize content according to the learners' diverse needs.
- Flexible budgeting policies should be put in place to allow allocation of funds toward differentiated teaching-learning materials like sensory tools, instead of standardized textbooks.
- Standard curriculum must be broken down into smaller, adjustable chunks of modules that can be reordered or emphasized based on a learner's specific strengths or learning gaps.
- Alternative forms of assessment such as oral presentations, project-based assessments etc need to be emphasized instead of relying solely on written exams.

9. Limitations

It is important to acknowledge certain constraints within this research:

- The data is based on School Companion Sensory Profile 2 by Winnie Dunn, which, while standardised, is subject to the potential biases of a single educator in one school environment.
- Focusing on one set of twins limits the broad generalizability of the findings to the entire ASD population.

10. Conclusion

The study's findings indicate that Twin A and Twin B, while identical in many respects, possess contrasting sensory profiles: Twin A is mainly impacted by Movement Processing, whereas Twin B's significant challenge lies in Behavioral Responses and Auditory Sensitivity.

Therefore, this study proves that identical environments do not produce identical sensory needs. True pedagogical equity is not achieved by providing the same support to all neurodivergent students, but by calibrating the educational environment to the distinct biological reality of each child. By recognizing these unique sensory footprints, educators can foster a sense of independence and responsibility that allows each learner to thrive according to their own neurological profile.



REFERENCES

1. Chen, L., Abrams, D. A., Rosenberg-Lee, M., Iuculano, T., Wakeman, H. N., Prathap, S., Chen, T., & Menon, V. (2018). Quantitative analysis of heterogeneity in academic achievement of children with autism. *Clinical Psychological Science*, 7(2), 362–380. <https://doi.org/10.1177/2167702618809353>
2. Farrell, P. (2004). School psychologists. *School Psychology International*, 25(1), 5–19. <https://doi.org/10.1177/0143034304041500>
3. Nthibeli, M., Griffiths, D., & Bekker, T. (2022, June 30). *Teaching learners with autism in the South African inclusive classroom: Pedagogic strategies and possibilities*. Nthibeli | African Journal of Disability. <https://ajod.org/index.php/ajod/article/view/979/1864>
4. Petersson-Bloom, L., & Holmqvist, M. (2022). Strategies in supporting inclusive education for autistic students—A systematic review of qualitative research results. *Autism & Developmental Language Impairments*, 7, 23969415221123429. <https://doi.org/10.1177/23969415221123429>
5. Rodriguez, C. C., & Garro-Gil, N. (2015). Inclusion and integration on special education. *Procedia - Social and Behavioral Sciences*, 191, 1323–1327. <https://doi.org/10.1016/j.sbspro.2015.04.488>
6. Tomlinson, C. A. (2014). *The Differentiated Classroom: Responding to the Needs of All Learners* (2nd ed.). ASCD (Association for Supervision and Curriculum Development). https://books.google.co.in/books?hl=en&lr=&id=CLigAwAAQBAJ&oi=fnd&pg=PP1&dq=the+differentiated+classroom+by+carol+ann+tomlinson&ots=Ahqnnljapp&sig=6FS8x7LTThlmY-8n-myDxD4bic&redir_esc=y#v=onepage&q=the%20differentiated%20classroom%20by%20carol%20ann%20tomlinson&f=false

Appendix

SCHOOL COMPANION



SCHOOL COMPANION
SENSORY PROFILE 2

Winnie Dunn, PhD, OTR, FAOTA

Teacher Questionnaire
3:0 to 14:11 years

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Calculation of Child's Age

	Year	Month	Day
Test Date			
Birth Date			
Age			

Student's First Name: _____ Student's Middle Name: _____

Student's Last Name: _____ ID Number: _____

Student's Preferred Name (if different from above): _____

Gender: ☐ Male ☐ Female Birth Date: ____/____/____ Test Date: ____/____/____

Examiner/Service Provider's Name: _____

Examiner/Service Provider's Profession: _____

Completed by/Teacher's Name: _____

Name of School/Daycare Center: _____ Student's Grade Level: _____

Please estimate the frequency of contact you have with this student:
☐ 1 day/week ☐ 2 days/week ☐ 3 to 4 days/week ☐ Daily ☐ Other

How many years have you had contact with this student?
☐ 6 mos or less ☐ 7 mos to 1 yr ☐ 1 to 2 yrs ☐ 2 to 3 yrs ☐ 3 to 4 yrs ☐ 4 to 5 yrs ☐ 5 yrs or more

INSTRUCTIONS

The pages that follow contain statements that describe how students may act. Please read each phrase and select the option that best describes how often this student shows these behaviors. *Please mark one option for every statement.*

Use these guidelines to mark your responses:

When presented with the opportunity, this student...

Almost Always	responds in this manner Almost Always (90% or more of the time).
Frequently	responds in this manner Frequently (75% of the time).
Half the Time	responds in this manner Half the Time (50% of the time).
Occasionally	responds in this manner Occasionally (25% of the time).
Almost Never	responds in this manner Almost Never (10% or less of the time).
Does Not Apply	If you are unable to answer because you have not observed the behavior or believe that it does not apply to this student, please check Does Not Apply .

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1 2 3 4 5 6 7 8 9 10 11 12 A B C D E



Product Number 0158700066

Almost Always = 90% or more		Frequently = 75%		Half the Time = 50%		Occasionally = 25%		Almost Never = 10% or less	
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AUDITORY Processing			Almost Always	Frequently	Half the Time	Occasionally	Almost Never	Does Not Apply
School Factor	Quadrant	Item	5	4	3	2	1	0
		My student...						
1	RG	1 misses verbal directions in class more than same-aged students.						
1	RG	2 tunes me out or seems to ignore me.						
3	RG	3 struggles to complete tasks in a noisy setting.						
2	SN	4 tells others to be quiet.						
3	AV	5 becomes distressed during assemblies, lunch, or other large gatherings.						
3	SN	6 reacts strongly to unexpected or loud noises (for example, fire alarm, books dropping to floor, doors slamming, announcements, bells).						
3	SN	7 has difficulty participating in group activities where there is a lot of talking.						
AUDITORY Raw Score								
AUDITORY Processing Comments: _____								

VISUAL Processing			Almost Always	Frequently	Half the Time	Occasionally	Almost Never	Does Not Apply
School Factor	Quadrant	Item	5	4	3	2	1	0
		My student...						
1	RG	8 misses written or demonstrated directions more than same-aged students.						
1	RG	9 struggles to keep materials and supplies organized for use during the day.						
1	RG	10 leaves items blank on a busy worksheet, despite knowing the answers.						
2	SK	11 watches people as they move around the room.						
2	SN	12 looks away from tasks to notice all actions in the room.						
4	RG	13 misses eye contact with me during everyday interactions.						
2	SK	14 is attracted to TV or computer screens with fast-paced, brightly colored graphics.						
VISUAL Raw Score								
VISUAL Processing Comments: _____								

Almost Always = 90% or more Frequently = 75% Half the Time = 50% Occasionally = 25% Almost Never = 10% or less

School Factor	Quadrant	Item	TOUCH Processing						Does Not Apply
			Almost Always	Frequently	Half the Time	Occasionally	Almost Never		
			5	4	3	2	1	0	
1	SK	15	My student... gets too close to others when talking face-to-face.						
1	RG	16	doesn't seem to notice when face and hands remain dirty.						
1	SK	17	touches people or objects to the point of annoying others.						
2	SK	18	displays need to touch objects, surfaces, or textures (for example, wants to get the feeling of everything).						
2	SN	19	wants to wipe hands quickly during messy tasks.						
2	SN	20	is easily upset by minor injuries (for example, bumps into something, scrapes or cuts self).						
3	SN	21	uses only fingertips to work on projects requiring manipulation.						
3	AV	22	flinches or recoils when body is touched or when others get too close.						

TOUCH Raw Score

TOUCH Processing Comments: _____

School Factor	Quadrant	Item	MOVEMENT Processing						Does Not Apply
			Almost Always	Frequently	Half the Time	Occasionally	Almost Never		
			5	4	3	2	1	0	
4	RG	23	My student... fails to steady objects when working (for example, does not hold paper down when writing).						
1	SK	24	plays or fiddles with objects (for example, pencils, notebooks, folders).						
1	SN	25	is fidgety or disruptive when standing in line or close to other people (for example, getting on the bus, entering school, sitting in an assembly).						
1	RG	26	slouches, slumps, or sprawls in chair.						
1	RG	27	bumps into things, failing to notice objects or people in the way.						
1	SK	28	is "on the go."						
2	SK	29	seems to find endless reasons to approach a teacher.						
4	AV	30	is slower to participate in physically active tasks or activities than same-aged students.						

MOVEMENT Raw Score

MOVEMENT Processing Comments: _____

* This item is not part of the MOVEMENT Raw Score.

MOVEMENT Processing Comments: _____

Almost Always = 90% or more	Frequently = 75%	Half the Time = 50%	Occasionally = 25%	Almost Never = 10% or less
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School Factor	Quadrant	Item	BEHAVIORAL Responses Associated With Sensory Processing	Almost Always	Frequently	Half the Time	Occasionally	Almost Never	Does Not Apply
				5	4	3	2	1	0
3	RG	33	My student... does things in a harder way than is needed (for example, wastes time, moves slowly).						
4	RG	34	appears tired (for example, has no energy, is sluggish).						
2	SN	35	could be described as overreactive or dramatic compared to same-aged students.						
4	AV	36	lacks a sense of humor.						
4	AV	37	could be described as inflexible compared to same-aged students.						
3	AV	38	is distressed by changes in plans, routines, or expectations.						
3	SN	39	can be stubborn or uncooperative.						
3	AV	40	perseverates to a point that interferes with participation (for example, can't "shift gears").						
3	AV	41	withdraws when there are changes in the environment or routine.						
3	AV	42	gets frustrated easily.						
4	AV	43	interacts or participates in groups less than same-aged students.						
BEHAVIORAL Raw Score									
2	SN	44	is bothered by rules being broken.*						

* This item is not part of the BEHAVIORAL Raw Score.

BEHAVIORAL Responses Comments: _____

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ICON KEY	
SK	Seeking
AV	Avoiding
SN	Sensitivity
RG	Registration

SCORE KEY	
5	Almost Always = 90% or more
4	Frequently = 75%
3	Half the Time = 50%
2	Occasionally = 25%
1	Almost Never = 10% or less