Proceedings of the 7th International Conference on Education Innovation and Philosophical Insights
DOI: 10.54254/2753-7048/2026.37076

The Mediation Pathways of Psychological Needs in Students with ASD on Learning Motivation: A Self-Determination Theory Approach

Sisi Gui

Social Business Sustainability of Management, Tung Wah College, Hong Kong, China
24007464@twc.edu.hk

Abstract. Students with Autism Spectrum Disorder (ASD) generally exhibit lower levels of learning motivation in mainstream classrooms than their peers; however, the relationship between the basic psychological needs of ASD students and their learning motivation remains under-researched. Based on Self-Determination Theory, this paper theoretically analyzes how autonomy, competence, and relatedness influence learning motivation in ASD students. The theoretical analysis indicates that teachers' need-supporting behaviors are unevenly distributed in inclusive classrooms, where autonomy support is scarce yet effective. The three mediation pathways are as follows: ASD's executive function difficulties lead to autonomy frustration, subsequently reducing learning motivation; ASD's limited cognitive flexibility and executive function difficulties cause competence frustration, thereby diminishing learning motivation; and social communication difficulties in students with ASD lead to belonging frustration, thereby reducing learning motivation. A sense of belonging serves as the foundation for autonomy and competence to function, with potential compensatory effects among the three needs. This paper proposes a theoretical mediation model of transmission from ASD characteristics to need impediments and subsequent changes in learning motivation, thereby providing practical guidance for teachers in inclusive education.

Keywords: Autism spectrum disorder, basic psychological needs, academic motivation, self-determination theory

1. Introduction

The widespread adoption of inclusive education has led to an increasing number of students on the autism spectrum (ASD) being placed in mainstream classrooms. However, research indicates that ASD students generally exhibit lower levels of learning motivation in mainstream classrooms than their peers, and insufficient classroom engagement has become a significant challenge for inclusive education [1]. The core and associated characteristics of ASD, including social communication deficits, executive function difficulties, and limited cognitive flexibility, may make it more difficult for these students to have positive learning experiences in regular classrooms [2]. While previous studies have separately examined the fulfillment of ASD students' needs or their levels of learning

© 2026 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7048/2026.37076

motivation, few directly link the two, and theoretical analysis of the transmission pathways among the three remains scarce. Consequently, this study focuses on the relationship between the basic psychological needs and learning motivation of ASD students, aiming to address this research gap.

Based on the framework of Self-Determination Theory and employing a theoretical analysis approach, this paper systematically reviews and integrates empirical research on the basic psychological needs and learning motivation of ASD students over the past decade. It aims to analyze the relationship between three fundamental psychological needs (autonomy, competence, and relatedness) and learning motivation among ASD students, and to construct a theoretical transmission path linking ASD characteristics to the obstruction of these needs and, subsequently, to changes in learning motivation. By applying Self-Determination Theory to the ASD population, this research provides a theoretical framework for educators in inclusive education to enhance the learning motivation of ASD students.

2. Literature review

2.1. Three types of demand

Self-Determination Theory (SDT) posits that individuals' intrinsic motivation and mental health depend on the fulfillment of three fundamental psychological needs: autonomy, competence, and relatedness [3].

A sense of autonomy refers to the psychological experience where an individual perceives their actions as stemming from their own will rather than external control [3]. In classroom settings, the fulfillment of autonomy typically manifests when teachers provide opportunities for choice, listen to students' ideas, acknowledge their perspectives, and explain the personal significance of learning tasks [4]. Competence refers to the need to feel effective in overcoming challenges. Its satisfaction relies on clear task structures and constructive feedback. A sense of belonging refers to an individual's psychological need to feel cared for and accepted [3]. In the classroom environment, belongingness primarily stems from positive teacher-student and peer relationships. These three fundamental psychological needs collectively influence an individual's learning motivation and well-being [3]. The frustration of any one of those needs may also diminish the positive effects brought by the fulfilment of the other two.

2.2. Types of teacher support behaviors

Based on self-determination theory, teachers' need-supportive behaviors can be categorized as autonomous support, structure, and engagement [4, 5] Autonomous support refers to the cultivation of students' internal motivation resources by teachers through acknowledging their viewpoints, offering meaningful choices, and reducing controlling language [6]. Structure refers to the teacher providing clear, consistent, and predictable guidance and feedback in the classroom, including setting clear expectations, explaining tasks step by step, and providing informative feedback [5]. Engagement refers to the enthusiasm and care demonstrated by teachers in interactions, establishing warm and supportive relationships with students through verbal and non-verbal cues [5].

DOI: 10.54254/2753-7048/2026.37076

3. Theoretical analysis of basic psychological needs and learning motivation

3.1. Core characteristics and challenges of ASD

Research indicates that ASD is a type of neurodevelopmental disorder characterized by social communication disorders as its core feature, often accompanied by repetitive and stereotyped behavioral patterns [2]. Children with ASD often exhibit an imbalance in their ability development during the developmental process, particularly in areas such as social interaction [7]. These core characteristics make ASD students more vulnerable to the risk of basic psychological needs being frustrated in an inclusive classroom.

The core characteristics of ASD affect students' learning motivation by influencing their basic psychological needs (autonomy, competence, and belonging). When students' needs are met, their learning motivation is enhanced; when demand is frustrated, learning motivation decreases. In this process, teachers' supportive behaviors (autonomy support, structure, engagement) play a key regulatory role (see Figure 1).

Specifically, social communication barriers in ASD directly affect the satisfaction of their sense of belonging: students find it difficult to actively establish connections with peers and accurately interpret teachers' nonverbal cues [2]. Executive function difficulties (such as insufficiency in planning, organizing, and task initiation abilities) weakens the experience of autonomy, causing students to feel confused and anxious when facing open-ended choices [8]. The limited cognitive flexibility and low tolerance to uncertainty affect the acquisition of competence, making students prone to frustration in tasks without clear guidance [2]. The three core characteristics and three basic psychological needs do not correspond one-to-one but are interwoven and jointly affect the overall experience of ASD students in the classroom.

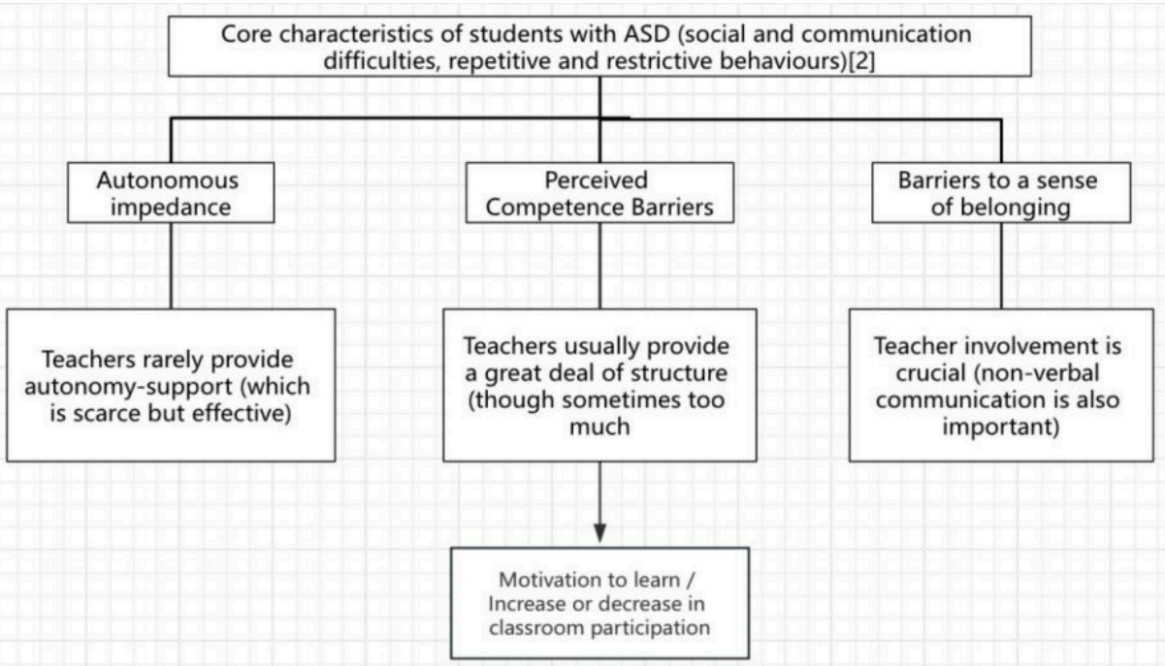


Figure 1. Theoretical pathway linking core characteristics of ASD to learning motivation

DOI: 10.54254/2753-7048/2026.37076

3.2. Analysis of the three pathways

3.2.1. Pathways of the sense of autonomy

One of the core characteristics of ASD is executive dysfunction, including deficits in planning, organization, task initiation, and cognitive flexibility [2]. Executive function is closely related to self-determination—that is, the ability to make choices, decisions, and set goals [8]. In classroom settings, the fulfillment of autonomy typically manifests as students having opportunities to make choices, express ideas, and perceive their behavior as stemming from their own will [3].

Research indicates that children with ASD face particular difficulties in open-ended, unstructured tasks [9-11]. These tasks lack explicit instructions and a clear framework, requiring individuals to independently plan, strategize, and interpret implicit expectations. For ASD students who experience difficulties with executive function, when teachers present open-ended choices (e.g., "What task would you like to do?") or tasks requiring self-planning, they may feel confused or even anxious due to their struggle with independent planning, rather than experiencing a sense of autonomy [9, 10].

A sense of autonomy is the core psychological foundation of intrinsic motivation. According to self-determination theory, when autonomy is thwarted, individuals' intrinsic interest and engagement in learning tasks significantly decline [3]. Therefore, the executive function difficulties of ASD students indirectly lead to a decline in learning motivation by weakening their autonomous experience.

3.2.2. Pathways of sense of competence

The cognitive characteristics of ASD include cognitive rigidity, difficulty in organizing tasks, and low tolerance for uncertainty [2]. Research indicates that individuals with ASD exhibit significant challenges in cognitive flexibility, particularly in situations requiring task switching and adaptation to change [12]. These characteristics make ASD students more prone to feeling incompetent and frustrated in classroom environments lacking clear guidance.

In classroom settings, the satisfaction of a sense of competence depends on clear task structures, explicit guidance, and constructive feedback [3]. However, due to cognitive rigidity and difficulties in task organization, students with ASD struggle to establish a sense of control over tasks when faced with ambiguous or inconsistent task requirements. Research has shown that when the classroom environment is described as "chaotic and unsafe," the learning experience of students with ASD is negatively impacted; conversely, when teachers provide clear instructional practices and explicit expectations, students can better perceive competence and support [13].

Additionally, there is a discrepancy between the academic self-concept (i.e., students' perception of their own learning abilities) and actual performance among students with ASD. Research indicates that, unlike typically developing peers, the reading self-concept of ASD students fails to effectively predict their actual reading performance [14]. This suggests that ASD students may struggle to accurately assess their own abilities, leading to inaccurate negative self-evaluations. When their sense of competence is frustrated, such misaligned self-evaluations may lead students to avoid challenging tasks, reduce engagement in learning activities, and consequently diminish their motivation to learn [3]. Meanwhile, academic self-efficacy among adolescents with ASD is significantly correlated with subjective well-being, highlighting a close link between self-evaluation and overall learning experience. Ameis et al. noted that executive function in middle childhood significantly mediates the relationship between early ASD symptoms and adolescent academic

DOI: 10.54254/2753-7048/2026.37076

performance [15, 16]. This further demonstrates that executive dysfunction serves as a critical mechanism underlying the sense of frustration regarding competence in ASD students.

3.2.3. Pathway of the sense of belonging

One of the core characteristics of ASD is impaired social communication, which causes students with ASD to face significant difficulties in forming and maintaining peer relationships [2]. According to the social motivation theory of autism, ASD is associated with diminished social motivation, including a reduced drive for social acceptance and avoidance of rejection [17]. At the behavioral level, individuals with ASD exhibit reduced social orientation (less attention to social stimuli) and diminished social seeking (less effort to obtain social engagement) [18], which further limits their opportunities to connect with others.

In the classroom settings, a sense of belonging refers to an individual's psychological need to feel connected, cared for, and accepted by others, primarily stemming from positive teacher-student and peer relationships [3]. Due to social communication difficulties, ASD students struggle to accurately interpret others' social signals and non-verbal cues, making it challenging for them to initiate and maintain social interactions, which often leads to feelings of isolation in the classroom. Research indicates that children and adolescents with ASD report significantly higher levels of loneliness compared to their typically developing peers [19]. Furthermore, the quality of friendship (companionship) mediates loneliness in ASD adolescents, with stronger positive aspects of friendship correlating with lower levels of loneliness [20]. These findings suggest that ASD students face a higher risk of having their need for a sense of belonging in the classroom frustrated.

According to self-determination theory, when a sense of belonging is frustrated, individuals' intrinsic motivation and classroom engagement significantly decline [3]. For ASD students, a frustrated sense of belonging may lead to feelings of insecurity in the classroom environment, reducing their emotional investment in learning activities and consequently, weakening their motivation to learn. Prolonged frustration regarding their sense of belonging may also foster negative attitudes towards school, further exacerbating the decline in motivation.

3.3. The comprehensive role of teacher support in meeting the needs of students with ASD

In the inclusive classrooms, teachers' supportive behaviors play a crucial role in alleviating the basic psychological needs of ASD students and enhancing their learning motivation. Esqueda Villegas et al. found in their classroom observations of ASD secondary school students in the Netherlands and Mexico that teacher structured discourse account for 62.5% of all classroom discourse, representing the most common form of support. However, autonomy support accounts for only 5.2%, which is extremely scarce; teacher engagement behaviors account for approximately 16.9%. This indicates that autonomy support remains systematically lacking.

Existing evidence suggests that it has a positive impact on the learning motivation of ASD students. When teachers provide autonomy support, the task engagement and listening behaviors of ASD students significantly increase [1]. A student interview study conducted by Esqueda Villegas et al. also confirmed this finding: a small number of students who received autonomy support reported that having the opportunity to choose enhanced their task engagement and learning progress [21]. In terms of structural support, when teachers provide clear task instructions and incremental feedback, ASD students typically exhibit higher task engagement and listening behaviors [1]. Shepherd &Carroll confirmed that structured classroom environments and clear teaching practices help ASD students establish a sense of control over tasks [13]. In terms of engagement and support, teachers'

DOI: 10.54254/2753-7048/2026.37076

care and acceptance are crucial to students with ASD's sense of belonging. From the student's subjective experience, the key to satisfying a sense of belonging hinges on whether the teacher truly understands the students - the core of a sense of belonging is when students report that "the teacher truly understands me and knows what I need" [22]. Furthermore, Esqueda Villegas et al. found that although teachers' engagement behaviors accounted for only 16.9%, students' perceived level of engagement was significantly higher than observed records, suggesting that ASD students may interpret care from non-verbal cues (such as tone of voice and facial expressions). One student evaluated their math teacher, saying, 'He doesn't judge my problem at all... When he listens to you tell stories, he really understands you' [21].

4. Discussion

4.1. Interactions among the three psychological needs

When teachers provide autonomy support, the task engagement and listening behaviors of ASD students significantly increase [1], and the sense of achievement derived from this active engagement may in turn enhance students' sense of competence. Conversely, completely passively executing instructions, even if the task is simple, is difficult to generate a truly competent experience. This indicates a mutually reinforcing relationship between a sense of autonomy and competence.

Sense of belonging is a prerequisite for autonomy and a sense of competence to take effect. Only when ASD students feel understood by their teachers and accepted by classmates will they be willing to take the risks of making choices and face the challenges of tasks [22]. A good teacher-student relationship is a crucial foundation for ASD students' classroom participation, and the negative correlation between teacher-student conflict and learning engagement is more significant among ASD students [23]. Furthermore, there may be a mechanism for mutual compensation among the three types of demands. When one need is difficult to meet, the fulfilment of other needs may partially offset the loss of motivation. For example, autonomy support is generally lacking in inclusive classrooms, but a strong sense of belonging or a high level of structured support may, to some extent, mitigate the negative effects of insufficient autonomy support [1]. However, this compensation mechanism still requires empirical research and testing.

4.2. Practice implications

To meet the basic psychological needs of ASD students, teachers can optimize support strategies in inclusive classrooms from three aspects. Firstly, teachers should consciously increase support for autonomy. Teachers can embed their choices within a clear task framework, such as providing 2-3 specific options and limited, clear, low burden choices, to reduce the burden of executive function and enhance students' autonomous experience. Secondly, teachers should express care and acceptance through both verbal and non-verbal behaviors. Teachers should reduce their judgmental responses to students' questions in daily interactions and, when students are speaking, maintain focused eye contact and pause to listen, further promoting a sense among ASD students that the teacher truly understands them. Thirdly, the presentation of the structure should be flexibly adjusted according to individual differences among students. For example, for students with limited cognitive flexibility, advance notice prompts can be given before task transitions. This allows ASD students to make appropriate adjustments within the established framework.

DOI: 10.54254/2753-7048/2026.37076

5. Conclusion

Based on Self-Determination Theory, this study systematically analyzes the relationship between the three basic psychological needs (autonomy, competence, and belonging) of ASD students and their learning motivation. A theoretical transmission pathway model is constructed from the core characteristics of ASD to the obstruction of needs and then to the change of learning motivation. Research has found that social communication barriers, executive function difficulties and limited cognitive flexibility in ASD make their three needs more susceptible to frustration in mainstream classrooms. The distribution of teachers' need-supportive behaviors in inclusive classrooms is uneven, and although autonomy support is limited, it is effective. The three needs do not operate independently, and a sense of belonging is the foundation for autonomy and competence to function. There is a possibility of mutual compensation among the three. There is significant heterogeneity within the ASD population. Furthermore, teachers' autonomy support, structure, and engagement have a significant moderating effect on students' learning motivation, thus imposing further requirements on teacher behaviors.

However, as this study is a theoretical analysis paper, the proposed transmission path model needs to be tested in future empirical research. The direct research on the relationship between the basic psychological needs and learning motivation of ASD students in existing literature remains limited. Furthermore, some literature suggests that there is considerable heterogeneity within the ASD population, and future research needs to further explore the different response patterns of various subgroups to the three types of needs support through questionnaires, interviews, and long-term follow-up surveys.

References

[1] Esqueda Villegas, F., van der Steen, S., van Dijk, M., Esqueda Villegas, D. A., & Minnaert, A. (2025). Teacher-student interactions of autistic adolescents: Relationships between teacher autonomy support, structure, involvement and student engagement. *Journal of Autism and Developmental Disorders*. Advance online publication. https://doi.org/10.1007/s10803-025-06723-0

[2] Lord, C., Brugha, T. S., Charman, T., Cusack, J., Dumas, G., Frazier, T., Jones, E. J. H., Jones, R. M., Pickles, A., State, M. W., Taylor, J. L., & Veenstra-VanderWeele, J. (2020). Autism spectrum disorder. *Nature Reviews Disease Primers, 6*(1), 5. https://doi.org/10.1038/s41572-019-0138-4

[3] Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68–78. https://doi.org/10.1037/0003-066X.55.1.68

[4] Han, K. (2021). Fostering students' autonomy and engagement in EFL classroom through proximal classroom factors: Autonomy-supportive behaviors and student-teacher relationships. *Frontiers in Psychology, 12*, 767079. https://doi.org/10.3389/fpsyg.2021.767079

[5] Haakma, I., Janssen, M., & Minnaert, A. (2017). Intervening to improve teachers' need-supportive behaviour using self-determination theory: Its effects on teachers and on the motivation of students with deafblindness. *International Journal of Disability, Development and Education, 64*(3), 310–327. https://doi.org/10.1080/1034912X.2016.1213376

[6] Núñez, J. L., & León, J. (2015). Autonomy support in the classroom: A review from self-determination theory. *European Psychologist, 20*(4), 275–283. https://doi.org/10.1027/1016-9040/a000234

[7] Lopez Resa, P., & Moraleda Sepúlveda, E. (2024). Developmental profile in children aged 3-6 years: Down syndrome vs. autism spectrum disorder. *Behavioral Sciences, 14*(5), 380. https://doi.org/10.3390/bs14050380

[8] Tomaszewski, B., Klinger, L. G., & Pugliese, C. E. (2022). Self-determination in autistic transition-aged youth without intellectual disability. *Journal of Autism and Developmental Disorders, 52*(9), 4067–4078. https://doi.org/10.1007/s10803-021-05280-6

[9] White, S. J., Burgess, P. W., & Hill, E. L. (2009). Impairments on open-ended executive function tasks in autism spectrum disorder. *Autism Research, 2*(5), 271–282. https://doi.org/10.1002/aur.78

DOI: 10.54254/2753-7048/2026.37076

[10] White, S. J. (2013). The triple I: Impairment in insight, imagination, and introspection in autism spectrum disorder. *Journal of Autism and Developmental Disorders, 43*(8), 1761–1776. https://doi.org/10.1007/s10803-012-1550-8

[11] van den Berg, L. J., de Jonge, M. V., & Naber, F. B. A. (2017). Executive function and social functioning in children and adolescents with autism spectrum disorder: The role of metacognition. *Frontiers in Behavioral Neuroscience, 11*, 258. https://doi.org/10.3389/fnbeh.2017.00258

[12] Uddin, L. Q., & Dajani, D. R. (2023). Cognitive flexibility in autism spectrum disorder: A meta-analysis. *Neuroscience & Biobehavioral Reviews, 153*, 105511. https://doi.org/10.1016/j.neubiorev.2023.105511

[13] Shepherd, D., & Carroll, P. (2021). Mothers' perspectives on teacher practices for children with autism spectrum disorder in the classroom. *International Journal of Inclusive Education, 27*(5), 612–628. https://doi.org/10.1080/13603116.2021.1978002

[14] Zeleke, W. A., Hughes, T. L., & Drozda, N. (2018). Academic self-concept and academic achievement in children and adolescents with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 48*(12), 4085–4095. https://doi.org/10.1007/s10803-017-3403-y

[15] Kilic Tulu, B., Ozbek, A. B., & Girli, A. (2026). A comparative study of self-efficacy, loneliness, and well-being in adolescents diagnosed with autism spectrum disorder and specific learning disorder. *Journal of Autism and Developmental Disorders*. Advance online publication. https://doi.org/10.1007/s10803-026-07247-x

[16] Ameis, S. H., Haltigan, J. D., Lyon, R. E., Sawyer, A., Mirenda, P., Kerns, C. M., Smith, I. M., Vaillancourt, T., Volden, J., Waddell, C., Zwaigenbaum, L., Bennett, T., Duku, E., Elsabbagh, M., Georgiades, S., Ungar, W. J., Zaidman-Zait, A., Lai, M. C., Szatmari, P., & Pathways in ASD Study Team. (2022). Middle-childhood executive functioning mediates associations between early-childhood autism symptoms and adolescent mental health, academic and functional outcomes in autistic children. *Journal of Child Psychology and Psychiatry, 63*(5), 553–562. https://doi.org/10.1111/jcpp.13493

[17] Chevallier, C., Kohls, G., Troiani, V., Brodkin, E. S., & Schultz, R. T. (2012). The social motivation theory of autism. *Trends in Cognitive Sciences, 16*(4), 231–239. https://doi.org/10.1016/j.tics.2012.02.007

[18] Clements, C. C., Zoltowski, A. R., Yankowitz, L. D., Yerys, B. E., & Schultz, R. T. (2020). A meta-analysis of behavioral studies of social orienting and social seeking in autism spectrum disorder. *Neuroscience & Biobehavioral Reviews, 119*, 130–140. https://doi.org/10.1016/j.neubiorev.2020.10.003

[19] Bauminger, N., & Kasari, C. (2016). Loneliness and social functioning in children and adolescents with autism spectrum disorder. *Child Psychiatry & Human Development, 47*(5), 779–791. https://doi.org/10.1007/s10578-016-0707-7

[20] O'Connor, R. A. G., & Wainer, A. L. (2023). The mediating role of friendship between autistic features and loneliness in adolescents with autism spectrum disorder. *Journal of Autism and Developmental Disorders*. https://doi.org/10.1007/s10803-023-05958-z

[21] Esqueda Villegas, F., Berlang, E., van der Steen, S., & Minnaert, A. (2026). How do autistic students experience need-supportive teaching in mainstream secondary schools? A joint display analysis. *Journal of Research in Special Educational Needs, 26*(2), e70087. https://doi.org/10.1111/1471-3802.70087

[22] Smith, J., Rabba, A. S., Coverdale, G., Datta, P., Hall, G., Heyworth, M., Hudry, K., Lawson, W., Lilley, R., & Pellicano, E. (2025). "I just feel like the teacher understood me, and she knew what I needed": School experiences of autistic students from diverse backgrounds. *Autism and Developmental Language Impairments, 10*, 23969415251377973. https://doi.org/10.1177/23969415251377973

[23] Roorda, D. L., Zee, M., Bosman, R. J., & Koomen, H. M. Y. (2021). Student–teacher relationships and school engagement: Comparing boys from special education for autism spectrum disorders and regular education. *Journal of Applied Developmental Psychology, 74*, 1012.