



Teachers' responses to anxiety in students with autism spectrum disorder: Proposal of a predictive model

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Introduction. Students with autism spectrum disorder (ASD) experience clinical or subclinical levels of anxiety which problematizes the possibilities of communication and social interaction. Current educational demands require the exploration of variables linked to the mediation of teachers' responses to the anxiety of students with ASD. *Objective.* To propose a predictive model based on mediating variables of teachers' responses to the anxiety of students with ASD in inclusive schools. *Methods.* This manuscript is focused on the review of the variables: knowledge about ASD, emotional regulation strategies, experience in special/inclusive education, and teachers' attitudes towards inclusion. *Results.* The evidence suggests that the variables reviewed are key in the responses of teachers to the anxiety of students with ASD. Based on this finding, a model is proposed that associates high knowledge about ASD, cognitive reassessment as a strategy for emotional regulation, positive attitude, and experience in special and/or inclusive education with responses from teachers that promote autonomy, while indicators such as low knowledge about students with ASD, expressive suppression as an emotional regulation strategy, negative attitude, and little experience in special and/or inclusive education are related to responses that problematize anxiety symptoms in students with ASD. *Conclusion.* The predictive model proposed here is speculative, but theoretically, it paves the way for possible empirical studies that demonstrate its validity.

Keywords: autism, anxiety, teacher's attitude, inclusion, predictive model

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Introduction

Introduction to the clinical overlap of autism spectrum disorder and anxiety symptoms

The characteristics of people with autism spectrum disorder (ASD) begin to stand out in the early ages of development. The semiology is very variable, but as a general rule, they refer to a wide range of alterations in social interaction and communication, repetitive and stereotyped behaviors, and restricted interests (American Psychiatric Association, 2013). The possibility of an additional diagnosis is common in people with this neurodevelopmental condition. Clinical symptoms of anxiety are recognized as one of the most common problems, further limiting the cognitive, emotional, and volitional development of people with ASD (Kerns & Kendall, 2014). The meta-analysis carried out by van Steensel et al., (2011) emphasizes that the prevalence of clinical anxiety in the population with ASD reaches values of 40% compared to 13.4% of people with typical development.

The empirical literature underlines that clinical and subclinical symptoms of anxiety can exacerbate the features of ASD (Ersoy et al., 2021). The overlap between ASD and anxiety is embryonic and not well understood, but some evidence suggests that there may be bidirectionality between ASD traits and anxiety. In this sense, problems related to reciprocal social interaction can make social anxiety problems more latent, having an impact on people's autonomy and quality of life (Adams, Clark, & Simpson, 2019). In this regard, South & Rodgers (2017) emphasize that sensory problems and poor ability to understand and label one's own emotions (alexithymia) can generate significant amounts of rigidity and uncertainty in people with ASD when responding to social and emotional situations. Intolerance of uncertainty is a key mechanism underlying some anxiety disorders, suggesting that anxiety problems and features of ASD should not only be understood separately, but that the interaction between them should also be understood globally and holistically.

Much of the research on the clinical overlap of ASD and anxiety has been conducted from the perspective and experience of parents and/or caregivers, and the educational space has remained less considered in these studies (Adams, Young, & Keen, 2019). In this sense, understanding the role of the school and especially the work of teachers is key to providing the necessary support and adequate responses to students with ASD and comorbid anxiety (van Steensel & Heeman, 2017).

The impact of anxiety comorbidity in students with ASD diagnosis at school: the role of the teacher

Anxiety is a common school-age problem and is linked to academic problems, relationship difficulties, and rejection at school. Anxious behaviors limit, in varying proportions, the quality of student participation in educational and cultural activities carried out at school (Herzig-Anderson et al., 2012). In relation to this, both parents and teachers are well placed to support children with anxiety problems from the early stages of development. (Allen & Lerman, 2018).

The prevalence of ASD has been increasing (Bennett et al., 2018), and this has happened in the midst of an inclusive educational scenario that aims for students, with and without disabilities, to learn together in regular schools. This scenario has led students with ASD to participate more and more in inclusive schools, which poses new pedagogical challenges for teachers, including the approach or work around clinical and subclinical symptoms of anxiety. Research related to the experiences of teachers in this context has been conducted. However, it is not well understood how they respond to the clinical and subclinical anxiety of students with ASD (Soto-Chodiman et al., 2012).

The literature underlines that overprotective, sanctioning, and avoidant reinforcement responses from parents and/or caregivers contribute to the hardening of anxiety symptoms in children, while, on the contrary, responses associated with rewards, stimuli, and problem-solving promote student's autonomy (Murray et al., 2009). In accordance, a study conducted by Allen & Lerman (2018) explored teachers' responses to symptoms of separation anxiety, social anxiety, and generalized anxiety in elementary school students. The results indicated that male teachers were more likely than female teachers to use responses that reinforced anxiety symptoms, but there were no differences in responses that promoted autonomy. Teachers with more teaching experience did not rely on overprotective responses, while teachers with less experience did so by promoting anxiety. Finally, teachers reported that they were less likely to use autonomy-promoting responses in cases of separation anxiety compared to symptoms of social or generalized anxiety.

Based on these findings, Adams, MacDonald, & Keen (2019) conducted a comparative exploratory study that revealed that teachers responded differently to the anxiety of students with ASD versus those who meet the expected development standards. They also responded by promoting anxiety in students with ASD (overprotection, sanction, and reinforcement of anxious behavior) when students show generalized anxiety and separation anxiety symptoms but not social anxiety. These data allow us a first approximation of the responses of teachers towards the anxiety of students with ASD. However, to strengthen our understanding of this problem, it is necessary to explore what variables could mediate the teachers' responses.

Objective, justification, and social relevance of the manuscript

This argumentative manuscript examines the role of three variables that may be particularly relevant to understand teachers' responses to the anxiety of students with ASD in inclusive classrooms: (1) the knowledge that teachers have about the explanatory bases of ASD, which has been shown to be crucial to providing the necessary support and understanding the demands of students with special educational needs; (2) the emotional regulation strategies used by teachers, which have been shown to be key when dealing with situations that produce stress, anguish, and apprehension in pedagogical activities; and (3) the experience in special and inclusive education of teachers, an important aspect of solving the problems in the classroom.

These variables have been developed from the psychological and educational sciences, and they are closely related to the social role of teachers. Thus, the aim of this document is to propose a predictive model of teachers' responses to the anxiety of students with ASD in inclusive classrooms, using the theoretical and practical value of the variables mentioned in the previous lines. The proposal of this model is relevant because it contributes to the educational sciences, helping to prepare teachers to respond to the psychological and emotional needs of children in diverse educational contexts.

The model suggests a guide to explore the impact of the coexistence of ASD and anxiety in the classroom, especially in the pedagogical work of teachers. This model should be tested in future research to deepen the understanding of the role of teachers in the emotional well-being and mental health of children with ASD. Exploring the way in which teachers respond to the anxiety of students with ASD would promote a systemic comprehension of teaching in inclusive educational settings, which could enhance the participation of students with ASD in the classroom.

Model development

Teachers' knowledge of the explanatory bases of ASD as a key aspect in the development of their inclusive work

Even though many teachers are convinced about the relevance of inclusive practices for students with ASD, in practice, they lack time to respond to the individual needs of students with this neurodevelopmental condition (Urbanovská et al., 2014). A study carried out by Sanz et al. (2017) has highlighted that teachers often do not receive the necessary preparation and lack basic knowledge about students with ASD. This pedagogical weakness prevents some teachers in the inclusive classroom from responding adequately and in time to the emotional and cognitive demands of the student with ASD.

According to these findings, general education must continue to strengthen the conventional pedagogical proposal with elements that provide a greater understanding of disability, which allows teachers to know how to do it in inclusive settings. The knowledge of teachers is an essential requirement to move towards higher levels of inclusion in school, especially when it comes to students with ASD (Rhodes, 2017). Mastery of the explanatory bases of the disorder, in variable proportions, can help teachers respond in a more efficient way, promoting the autonomy of students with ASD. On the other hand, the absence of essential knowledge about ASD can lead teachers to work from conceptions of typical cognitive development and end up excluding students with ASD (Andrews et al., 2015). Teachers must not only take into account the characteristics of students with ASD, but also a wide variability of clinical problems that overlap with this condition. This probably causes a decrease in teachers' expectations due to the exacerbation of problematic behaviors in students with ASD, which can lead to a substantive impoverishment of the relationship between teachers and their students.

In terms of comorbidity, the impact of separation anxiety, generalized anxiety, and social anxiety on ASD has been reported by teachers as one of the juxtaposed problems that most disturbs school participation in students with these characteristics (Saggers et al., 2016). Thus, it is possible to assume that the teachers' knowledge constitutes a crucial element to respond to the anxiety of students with ASD. This knowledge could become an invaluable support in the pedagogical work to know when the behaviors are typical of ASD, anxiety, or the interaction of both clinical conditions. Considering this variable in inclusive educational settings could improve the strategies for effective interventions in the classroom.

The emotional regulation of teachers as a major aspect in the inclusion of students with ASD

The research on emotional regulation in school settings has been gaining attention, probably because managing one's own emotions has an impact on social behaviors, which is crucial for both children's and teachers' performance at school. Teachers must respond to multiple cognitive and emotional demands within the classroom, especially when working with students with ASD (Brotheridge & Grandey, 2002). Using adjusted strategies to regulate emotions is a protective factor for teachers' mental health that helps to manage stress, prevent burnout, and improve feelings of personal value, which in turn, could improve learning outcomes for students (Corcoran & Tormey, 2013).

The emotional regulation process consists of the conscious or unconscious efforts carried out by a person to determine the intensity and duration of their emotions in relation to the social circumstances in which they appear, the experience that they contribute, and their expression (Gross & Thompson, 2007).

From this perspective, the main emotional regulation strategies are cognitive reappraisal (alters emotional reactions at the time of their appearance, managing to change the emotional experience) and expressive suppression (changes the emotional expression, trying to hide the lived experience without being able to alter it). Empirical evidence underlines that cognitive reappraisal is the most adaptative strategy for adjusted emotional regulation (Brockman et al., 2017). Brackett et al. (2010) affirm that emotional regulation strategies predict feelings of personal achievement in teachers, which has a positive impact on the quality of interpersonal relationships. According to the criteria of Taxer & Gross (2018), both instrumental and hedonic emotional regulation allow teachers to modulate their own emotions and those of their students, promoting a positive climate in the classroom. However, the literature on the emotional regulation of special education teachers in inclusive educational settings is still limited (Hickman & Jureia, 2017). Teachers in inclusive schools, on numerous occasions, must work with students with ASD, who present complex peculiarities in verbal and non-verbal communication and in social behavior, which are often exacerbated by the juxtaposition with clinically significant anxiety symptoms (South & Rodgers, 2017).

In consequence, the teaching task of those teachers is much more complicated and forces them not only to work with the ravages of autism spectrum comorbidity and clinical and subclinical symptoms of anxiety, but also with their own state of mind regarding this work and challenges. It is possible to assume that teachers with more potential to understand and regulate their emotions can critically review their educational actions and better resolve the anguish and stress they experience at school, especially when it comes to responding to the anxiety of students with ASD. Undoubtedly, teachers' responses to comorbid anxiety with the autism spectrum can have a direct impact on their educational work and on the academic performance and participation of students with ASD in the regular classroom.

The importance of the experience and attitude of teachers towards the inclusion of students with ASD

Experience in special and/or inclusive education is a relevant characteristic that allows teachers to know how to exploit teaching possibilities during their pedagogical work, with the purpose of contributing to the personal and social development of students with special educational needs. Teachers with experience in special and/or inclusive classrooms may have a clearer understanding of the sociocultural and individual aspects that interact and mediate the participation of the student with ASD in the classroom. That is, they are much more likely to develop global explanations about student behavior, using the guiding bases of the literature and the experiences of parents as a complement, instead of reductionist explanations (Campo, 2012).

The experience in special and/or inclusive education is related to the teachers' attitude towards inclusion since it provides them with a more hopeful vision of disability, associated critically and consistently with successful inclusion (Rodríguez et al., 2012). Teachers who do not have the necessary experience and have a negative attitude towards inclusion report apprehension and anguish if they have to lead a class with students with some kind of disability, partly because of the characteristics of the students and also because of the scarcity of time and few methodological resources for providing adequate support (Anglim et al., 2018).

The teachers who have had experience in the education of children with ASD, as a general rule, have a more positive attitude than teachers who have not had the opportunity to do so (Park & Chitiyo, 2010). This is important to support successful inclusion, since the position of teachers can promote the implementation of inclusive practices or become a barrier to student learning and participation. In this sense, the experience and attitude of teachers are critical elements that can break with the conception of development stagnant to the problematic characteristics of students with ASD, considering the possibilities of development that students with these behavioral characteristics possess. It is likely that the most experienced teachers can develop a keen psychopedagogical observation that allows them to understand the behavioral characteristics inherent to autism and know how to separate them from other symptoms that overlap the condition, such as clinical symptoms of anxiety. It is also likely that teachers with a positive attitude towards inclusion respond to the clinical and subclinical symptoms of anxiety of students with ASD with rewards and encouragement, while teachers with a negative attitude respond using punishment. It is necessary to underline that interdisciplinary research is needed in this area, since the responses of teachers in educational spaces open to diversity, where students with ASD participate, are still not well understood (Robertson et al., 2003).

Predictive model proposal

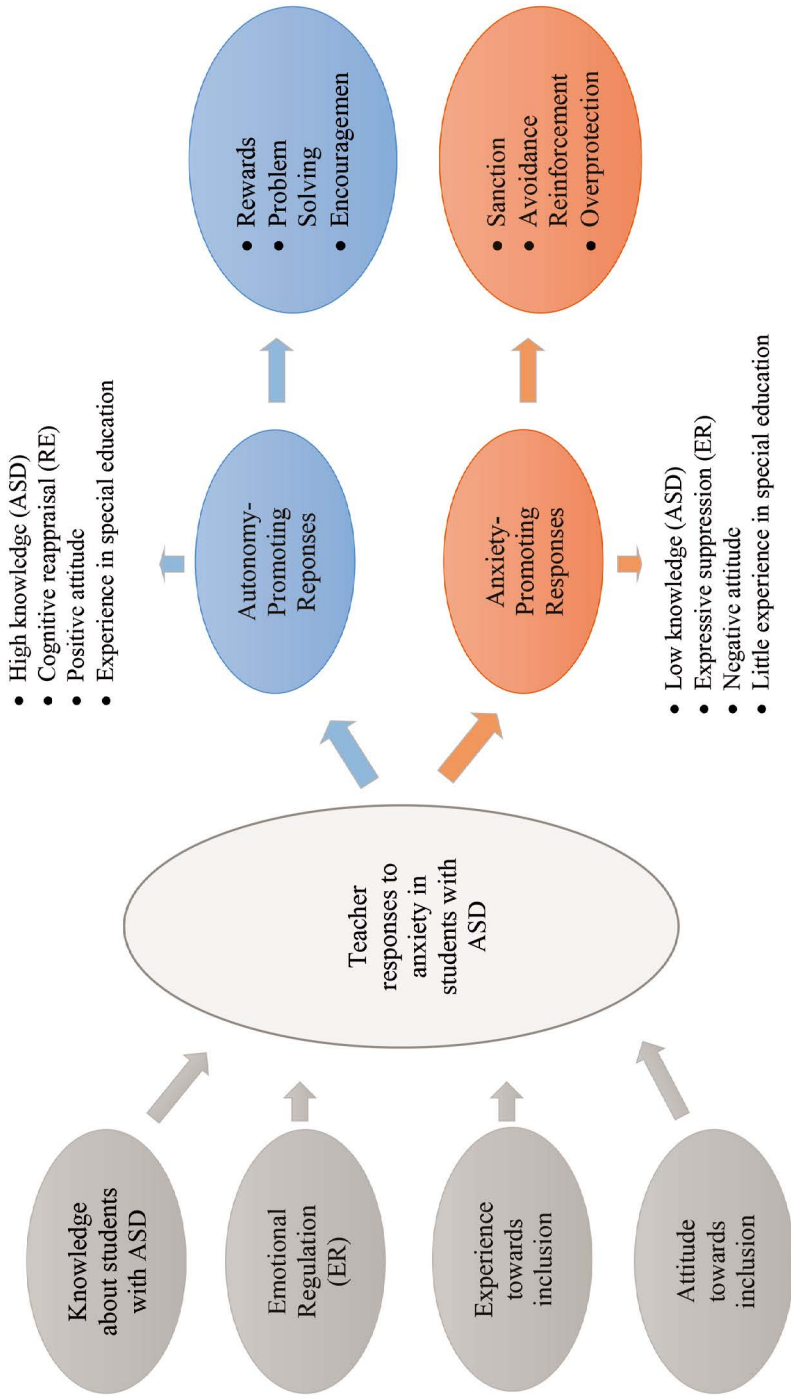
We have presented evidence of the importance of teachers' knowledge about the disorder, their emotional regulation strategies, and the experience and attitude of teachers regarding the inclusion of students with ASD in educational spaces. The evidence suggests that these variables may have a key role in teachers' responses to the anxiety of students with ASD. Nevertheless, it is necessary to underline that there may be other variables involved, such as teachers' personality characteristics and gender, that could have an impact on their practices. Recent studies have highlighted the relevance of each of these variables for the development of inclusive practices that seek to increase the participation of students with ASD. Considering this evidence, we propose the following predictive model as a basis for future studies that

seek to empirically verify the causal relationships between the variables addressed and the responses of teachers towards the anxiety of students with ASD in inclusive classrooms (see Figure 1). It has been proved that teachers' knowledge about the disability of their students is a fundamental aspect in supporting their demands in the classroom. Our model includes insights related to teachers' knowledge of ASD who have not yet received adequate guidance on the coexistence of autism and anxiety in the classroom, but which may also provide explanatory power. The evidence suggests that teachers' emotional regulation strategies are key to combating stress and anguish, and solving coexistence problems that arise in the classroom. Our model includes ideas related to the value of emotion regulation strategies when teachers respond to the onslaught of the clinical overlap of ASD and anxiety symptoms. The evidence also suggests that teachers' experience and attitude are requirements to support inclusion. The model that we propose uses the explanatory value of these variables, relating them to a problem that has been very little addressed in educational psychology and educational sciences.

According to the theory, the proposed model hypothesizes that indicators such as high knowledge about ASD, cognitive reappraisal (RE) as an emotional regulation strategy, positive attitude, and experience in special and/or inclusive education are related to the teachers' responses that promote autonomy (overprotection, sanctions, and avoidant reinforcement), and that indicators such as low knowledge about students with ASD, expressive suppression (ER) as an emotional regulation strategy, negative attitude, and little experience in special and/or inclusive education are related to responses that further problematize anxiety symptoms in autism (rewards, stimuli, and problem-solving). The predictive capacity of the model would have to be verified, but a valid question would be whether the indicators are distributed in this way to predict the responses of the teachers or they are combined in another way in practice.

Most of the results of the studies analyzed in this review are based on the operational benefits of self-report scales (Teacher Responses to Anxiety in Children Questionnaire – TRAC; The Autism Knowledge Questionnaire – AKQ; Emotion Regulation Questionnaire – ERQ). These instruments, like any self-report scale, include biases in the evaluation, despite their psychometric properties. In this sense, it is unavoidable to ask how valid the existing measures are to understand the role of the variables addressed in the responses of teachers towards the anxiety of students with ASD. There is an urgent need for experimental paradigms to address the responses of teachers in inclusive classrooms, since the observation and control of other variables can provide us with a causal explanation of the proposed model. Studies with these characteristics are necessary to clearly understand the role of teachers in inclusive classrooms where students with ASD participate.

Figure 1
Exploratory model of possible pathways related to teachers' responses to the anxiety of students with ASD in inclusive classrooms



Implications of the model for the development of educational inclusion of students with ASD

Theoretical models provide a relevant guiding framework for practice since they help to understand the complexity of human behavior. However, these models vary widely with respect to their degree of “realism” when it comes to representing the scenarios of social life, especially educational ones (Grober et al., 2004). Beyond these limitations, surprisingly, the coexistence of ASD and clinical symptoms of anxiety have not been addressed as a priority in schools, especially from the perspective of teachers. The proposed model could serve as a basis for developing studies that contribute to solving the lack of research in this area of education.

The literature related to contemporary education suggests that the inclusion of people with special educational needs could be enhanced by understanding the role of teachers (Siuty, 2019). In this sense, testing the proposed hypothetical model in future research contributes to understanding the nature of the bond between teachers and their students, specifically between teachers’ responses to the anxiety of students with ASD in inclusive classrooms. The results could become an organized and updated base to provide training, development, and support to the practical work of teachers, who have the social responsibility of educating children and adolescents with ASD and different symptoms of anxiety (Adams, MacDonald, & Keen, 2019).

The inclusion of students with ASD in regular classrooms has promoted research related to the preparation of teachers, since the work they carry out is relevant to changing the course of ASD behaviors towards a more adaptive functioning at each stage of development (Hawlder et al., 2018). In this sense, the model is developed in relation to the strategies that teachers use to respond to children’s anxiety, but it could also improve the comprehension of a wide range of symptoms that overlap with autism, such as depressive symptoms (Hollocks et al., 2019). This would contribute to the study and understanding of the teachers’ role, and ASD and its comorbid nature, which can provide recommendations for more effective intervention.

The psychological characteristics of teachers are critical aspects for the development of their pedagogical work in educational settings open to neurodiversity. That is why we included the emotional regulation strategies used by teachers in the proposed model, since it is known that the regulation of emotions is related to feelings of personal achievement in teachers (Brackett et al., 2010), which mediates the quality of interpersonal relationships. Taxer & Gross (2018) suggest that during their social work, teachers regulate their own emotions, as well as those of their students, in order to reduce the negative emotions that occur in the classroom. In this sense, the model not only attends to the findings that come from the studies of emotions and that demonstrate their relevance in social coexistence, but also contributes to eliminating the

vision of traditional education focused almost exclusively on the development of the intellect, with a marked forgetfulness of the emotional.

Conclusions

There is an urgent need to investigate the responses of teachers towards the anxiety of students with ASD in inclusive classrooms, emphasizing predictive variables that help us understand the teaching task. This theoretical article has focused on some of those variables (knowledge about ASD, emotional regulation strategies, experience in special/inclusive education, and attitude of teachers) that seem to be closely related to each other and that could predict teachers' responses towards the anxiety of students with ASD. The literature is clear on the relevance of these variables to support the pedagogical work of teachers in classrooms open to neurodiversity, but research is still needed to explain the relationship between them. In this regard, this predictive model is speculative, but it can be tested in future studies. Understanding the responses of teachers towards the anxiety of students with ASD and the variables involved could enhance the inclusion of people with ASD in educational settings.

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Odgovori nastavnika na anksioznost učenika s poremećajem iz spektra autizma: Predlog prediktivnog modela

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Uvod: Učenici s poremećajem iz spektra autizma (PSA) doživljavaju kliničke ili subkliničke nivoe anksioznosti koji problematizuju mogućnosti komunikacije i socijalne interakcije. Trenutni obrazovni zahtevi iziskuju istraživanje varijabli povezanih sa posredovanjem odgovora nastavnika na anksioznost učenika sa PSA. *Cilj:* Predložiti prediktivni model zasnovan na posredujućim varijablama odgovora nastavnika na anksioznost učenika sa PSA u inkluzivnim školama. *Metode:* Ovaj rukopis je fokusiran na pregled varijabli: znanja o PSA, strategije emocionalne regulacije, iskustva u specijalnom/inkluzivnom obrazovanju i stavovi nastavnika prema inkluziji. *Rezultati:* Dokazi sugerišu da su razmotrene varijable ključne u odgovorima nastavnika na anksioznost učenika sa PSA. Na osnovu ovog nalaza, predložen je model koji povezuje visoko znanje o PSA, kognitivno ponovno procenjivanje kao strategiju emocionalne regulacije, pozitivan stav i iskustvo u specijalnom i/ili inkluzivnom obrazovanju sa odgovorima nastavnika koji promovišu autonomiju, dok su indikatori kao što su slabo znanje o učenicima sa PSA, ekspresivno potiskivanje kao strategija emocionalne regulacije, negativan stav i malo iskustva u specijalnom i/ili inkluzivnom obrazovanju povezani sa odgovorima koji problematizuju simptome anksioznosti kod učenika sa PSA. *Zaključak:* Prediktivni model koji je ovde predložen je spekulativan, ali teoretski otvara put mogućim empirijskim studijama koje će demonstrirati njegovu validnost.

Ključne reči: autizam, anksioznost, stav nastavnika, inkluzija, prediktivni model

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