Triggered and maintained engagement with learning among gifted children in primary education

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Motivating gifted children to become and stay engaged with classroom tasks can be a huge struggle for primary education teachers. This concurrent parallel mixed method design study investigates the relative differences in the importance of the basic psychological needs between gifted children and children with an average IQ with respect to triggered and maintained engagement to learn. A total of 1,017 students (512 girls and 505 boys) from 35 schools participated in this study. The qualitative analysis showed that children identify a wide array of themes related to both the context of their learning experiences and to themselves. In addition, statistical analyses showed that while all children benefit from the fulfillment of their basic psychological needs, gifted children experience a greater need for autonomy support to become engaged in school tasks. To maintain engagement, even in the face of resistance, all children, regardless of their IQ, indicate that structure is important. Possible implications for teachers are addressed in the discussion.

KEYWORDS

gifted children, engagement, self-determination theory, autonomy support, structure

Introduction

Emily (8 years old) is a gifted student who masters subject matter very quickly. She skipped a year, and even then, she mastered all subjects excellently within a short time. Emily initially enjoyed going to school and looked forward to learning a lot. However, later, her enjoyment diminished, and there was a daily struggle with resistance to go to school.

Emily says that the lessons 'bring her little'. 'There has never been a moment in class when I really learned something new, something that made me think, like, I'm finally learning now! It is mainly waiting, and then you lose the desire to work.'

Emily describes that she is increasingly doing other things in class and that it is difficult for her to feel the need to concentrate on the assignments, although the teacher usually has a different idea, which sometimes ends in a spot of bother.

Emily says: 'Do you know how that feels? As if you are a racehorse that wants to run but has to stand in a stable that is too small all the time. Then your desire to learn fades. I am on the verge of not doing anything at all in class anymore'. (Individual interview gifted student, May 28, 2020)

Gifted children stand out in the classroom because they can generally take significant leaps in thinking and learning. They are quick-witted, often have a good memory, creative thinking skills, perfectionism, an original sense of humor, the ability to adopt a critical view of themselves, are more verbally adept than their peers, and have excellent problem-solving and analytical abilities (Van Gerven and Drent, 2000, 2007; Webb et al., 2007). Their broad interest, longer attention span, and a high degree of curiosity also stand out (Davis et al., 2011).

During classroom observations and conversations with teachers and students as part of the first author's work as a school psychologist, it has become apparent that gifted students stand out because they can learn through outstanding commitment, dedication, creativity, and task orientation (Snikkers, 2018).

Various definitions of giftedness (Resing and Drenth, 2007; Callahan and Hertberg-Davis, 2017) have been used in both the scientific literature and educational practice, depending on the preferred development model. However, apart from the exact definitions, there does seem to be a consensus on some characteristic aspects of giftedness. Students are said to be gifted if they not only have high intelligence but also a high degree of creativity and a strong task orientation (Renzulli, 1978; Lavrijsen and Verschueren, 2018; Ziegler and Heller, 2020). In essence, gifted students possess learning abilities, traits, and qualities that may positively influence their learning and learning processes.

Although their strong commitment to a task is characteristic of gifted students (Renzulli, 1978; Lavrijsen and Verschueren, 2018; Ziegler and Heller, 2020), in the school setting, it has not been found to be self-evident that these students genuinely engage in a task and stay focused to realize their potential (Minnaert, 2005), as Emily also shows.

Influenced by the study of Mönks (1992) focusing on the role of family, school, and peers as environmental factors, the child's social environment is now generally seen as an important factor concerning whether the gifted student's intellectual competences and skills come to fruition (Yang et al., 2023). However, the school does not seem to be the setting where gifted students can always be supported so that they become and remain engaged with learning at school. Teachers and parents recognize gifted students who—despite their learning potential—no longer want to go to school, do not feel involved in the lessons (anymore), underachieve, and have developed counterproductive work behavior or a fear of failure (Beckmann and Minnaert, 2018). This reflects Minnaert's (2005) argument that giftedness is not equivalent to highly motivated behavior (see also Gottfried et al., 2005; Pruisken and Rost, 2005).

Teachers have said that they experience hesitance to act when it comes to providing gifted students adequate educational support in a way that motivates them for their lessons so that they become and stay engaged with their schoolwork (Snikkers, 2018). In this respect, the standard approach to the educational support of students seems to fall short in helping many gifted students to become engaged, which is a point of concern and attention. Research has shown that more engaged students perform better and drop out less quickly than less engaged students (Klem and Connell, 2004; Deng, 2021), while they have more positive experiences of relatedness, competence, and autonomy at school (Connell et al., 1995).

Although many teachers experience hesitance to act in the educational support of gifted students concerning the engagement required to learn—as evidenced by questions from educational practitioners—even though motivation, engagement, and the self-determination theory have been extensively researched (Appleton et al., 2008; Ryan and Deci, 2017), empirical research providing insights into the factors that specifically play a role in this respect for gifted students as compared to students with average intelligence remains very limited.

To support teachers in providing such inclusive education, it is important to gain a better understanding of what gifted children believe to be necessary to become and remain engaged with their learning at school, the factors of influence here, and the implications for the interventions in the classroom.

It is precisely regarding giftedness and motivation that Minnaert et al. (2009) argued that the motivation of smart students can be promoted by meeting basic psychological needs, namely the need for relatedness, competence, and autonomy, as described in the self-determination theory (SDT) (Deci and Ryan, 2002). This can be a point of departure for gaining insights into factors that play a role in motivating gifted children so that they can then become and remain engaged.

Although the SDT is considered to be universally human because all people benefit from their fulfillment, whereby they form our foundation—so to speak—regardless of our gender (e.g., Deci et al., 2006), cultural background (e.g., Sheldon et al., 2001), or socio-economic status (e.g., Chen et al., 2015), we can ask whether gifted students need something else in terms of meeting their basic psychological needs than averagely intelligent children to whom the educational offer is essentially geared. Despite gifted students' potential to focus on tasks, the educational setting is not always the obvious environment to promote and maintain autonomous motivation and subsequent engagement in learning in these students. Do gifted students have other needs when it comes to support in the classroom?

Accordingly, the social question that arises concerns the factors for gifted students to be able to learn with engagement and continue to do so. Educational practitioners have asked explicit questions in this regard. It can be seen in the educational practice that while gifted students can quickly start working on assignments, they also throw in the towel as soon as they encounter resistance.

In this article, we will first outline the theoretical framework, explaining the meanings of autonomous motivation and engagement before exploring the conditions for becoming and staying engaged. The SDT (Deci and Ryan, 2002) will show which factors play a role in becoming motivated, while the CARE model (Minnaert, 2005) will provide insights into the factors that influence engagement and which precede them.

First, we will provide an idea of what children in primary school say that they need to be engaged with their learning at school. Next, we will explore whether and how the perspective of gifted students on the questions of what they need to become and remain engaged—even when they experience resistance—differs from that of students with average intelligence. Van Manen (2015) argued that from an

educational perspective, the crucial question is always how children experience this situation, which is why the voice and perspective of the child take the central stage in this research.

Having identified the factors that children claim to be building blocks for becoming and remaining engaged, we will discuss the implications for the educational offer.

Returning to Emily: what does she need to be able to learn and work again in the classroom? Can adjustments be made so that she experiences more freedom, wants to learn, and gets cracking?

To gain insights into the underlying factors that promote engagement, we will first look at the SDT (Deci and Ryan, 2002) as a theoretical framework for the concept of motivation as a condition for engagement. Next, we will focus on the CARE educational care model (Minnaert, 2005), which combines motivation and engagement and provides insights into what it takes to become engaged.

The SDT is about growth and personality performance (Deci and Ryan, 2000; Ryan and Deci, 2000; Vansteenkiste and Ryan, 2013; Ryan et al., 2015), and it emphasizes the factors that support or undermine people's motivation, vitality, and development. The SDT states that people are naturally focused on personal growth and want to interact with their environment actively. For this natural tendency to be expressed, they need input, encouragement, and support. It is assumed within the SDT that a person has three essential basic psychological needs from birth: the sense of autonomy, relatedness, and competence.

The need for autonomy (Deci and Ryan, 2000; Ryan and Deci, 2006) does not mean that the child can do as it pleases; instead, it is about the extent to which a child can be itself and experiences a sense of psychological freedom and choice in everyday thinking, feeling, or acting. It refers to the extent to which a person can determine their own behavior (Skinner and Belmont, 1993). In education, these needs can be met by—for instance—providing options with a certain freedom of choice and letting students know that they are accepted as they are (Vansteenkiste and Soenens, 2015).

The need for relatedness (Baumeister and Leary, 1995; Deci and Ryan, 2000, 2014) concerns the extent to which the child experiences a warm bond with important people in their life and the inner need to belong and make contact with others (Minnaert, 2005). In education, this may be the child experiencing the teacher's involvement, for instance. It is about the need for a sense of security to ensure a supportive, committed learning climate.

Competence (cf. White, 1959; Deci, 1975) concerns the extent to which children feel capable of completing tasks successfully. This requires an educational-instructional framework, central to which is not only the mastery of strategies but also the imparting of metacognitive knowledge and skills (Minnaert, 2005).

Research shows that these needs are universal (e.g., Sheldon et al., 2001; Deci et al., 2006; Chen et al., 2015). According to the SDT, the fulfillment of these three universal basic psychological needs is essential to personal development (Deci and Ryan, 2002): the more these basic psychological needs are met, the more people experience autonomous rather than controlled motivation (Deci and Ryan, 2000).

Autonomous motivation is a form of motivation characterized by a sense of psychological freedom and choice and mainly fuelled by internal drives (Vansteenkiste and Soenens, 2015). Supporting the growth toward more autonomous motivation is fulfilling the basic psychological needs to which the environment can respond by either supporting or undermining them. Autonomous motivation refers not only to intrinsic motivation—based on which you do something out of pleasure, passion, or interest—but also to identify behavioral regulation, in which the activity is valuable or important to the person concerned (Deci and Ryan, 2002). Vansteenkiste and Soenens (2015) argued that it is not so important whether an activity is intrinsically or extrinsically motivated as whether the activity is initiated from autonomous or controlled motivation. The more students have a decisive say in choices related to their learning behavior, the more positive effects emerge, the educational yields grow, and the necessary prerequisites expand, such as increased effort, better learning behavior, and greater wellbeing (Schuit et al., 2011).

How education is organized—in both educational and instructional terms—influences the extent to which students experience the fulfillment of their basic psychological needs, which in turn affects the student's degree of involvement in the task and learning process, reflecting the building blocks for engagement (Minnaert and Odenthal, 2018).

Engagement as a concept interfaces with the much-researched concept of motivation but is definitely not the same. For example, someone may be motivated but not engaged in performing a task. In other words, they need motivation, but motivation alone does not suffice for them to be engaged (Connell and Wellborn, 1991; Furrer and Skinner, 2003).

Renninger and Hidi (2016) describe that engagement and motivation are about the way in which people interact with their environment. Motivation is internal and refers to the will to do something out of a developing interest, whereas engagement is the expression of the will and shows the involvement of a person in their actions, for example, in the classroom. This study will focus on engagement because it becomes visible in the classroom and can provide clues for practical support in educational practice. Whereas motivation is located under the water's surface, engagement is metaphorically like the tip of the iceberg (Bergenhegouwen et al., 1998).

According to Kuh (2009), engagement is generally defined as 'the term used to represent constructs related to the quality of effort and involvement in executive learning activities' (p. 6). Put simply, engagement is seen as active involvement in a task or activity (Reeve et al., 2004) and—as 'energy in action'—it reflects the connection between the person and activity (Russell et al., 2005, p. 1).

In other words, engagement is not so much about the individual as it is about relationships (Sinclair et al., 2005), and it requires an environment that suits the person (Reschly and Christenson, 2006a,b). In the context of school, engagement becomes visible where the student and the teacher, classmates, and subject matter interact. Engagement is expressed in the quality of a child's connection to an activity, reflecting the degree of the child's willingness to make an effort and—for example—carry on with the lesson because they want to do so from within and then actually do so.

The literature on student engagement has gained increasing popularity in education research due to its associations with desired academic and non-academic outcomes, such as learning achievement and physical and psychological wellbeing (Yang et al., 2022, p. 1).

There is convincing empirical evidence of a relationship between engagement, school performance, and school behavior, showing that the environment plays an important role (Appleton et al., 2008; Xie and Derakhshan, 2021; Yang et al., 2023), supporting the idea of engagement as a construct that is important and strongly

related to effective learning (Dincer et al., 2019). By contributing to the fulfillment of basic psychological needs, the environment influences promoting child engagement in this context (Minnaert, 2005; Appleton et al., 2008). More specifically, by providing structure, autonomy support, and involvement, the (social) context exerts influence on the fulfillment of basic psychological needs, which in turn affects engagement. The CARE model (Minnaert, 2005) provides insights into how the SDT can be translated into practice and shows which factors in the educational learning context affect the fulfillment of the student's basic psychological needs.

In the context of educational support and inclusive education, Minnaert (2005) introduced the CARE model, which includes care for competence, autonomy, relatedness, and engagement (see Figure 1). According to Minnaert (2005), this educational care model allows 'the resources and frameworks to be used deliberately, purposefully, and adaptively, thereby doing justice to each student's needs' (Minnaert and Odenthal, 2018, p. 6).

The CARE model shows that there are pointers in both the context and the learner that influence engagement. Where the context is concerned, these are structure, autonomy support, and involvement. From the student's perspective, these are the basic psychological needs (Minnaert, 2005).

Structure—in the sense of providing information about the teacher's expectations and the intended results—supports children's basic psychological needs (Grolnick and Pomerantz, 2009; Jang et al., 2010). The information provided should not only be sufficient but also be clear (Skinner and Belmont, 1993), whereby it is about creating clear expectations in combination with setting boundaries (Vansteenkiste et al., 2012; Sher-Censor et al., 2015).

Autonomy support provides opportunities to act according to personal values and interests to create a sense of personal expression of will and psychological freedom (Reeve, 2009). Autonomy-supportive parenting allows room for negotiation, offers choices, and explicitly encourages the child to take the initiative (Soenens et al., 2007).

Involvement refers to—among other things—providing relational support (Vansteenkiste and Soenens, 2015). It concerns the extent to which the teacher shows positive interest in students by getting to know them better and taking the time to talk to them (Skinner et al., 1990; Skinner and Belmont, 1993).

It is argued that how the school learning environment is organized in terms of education and instruction influences the extent to which the student experiences those basic psychological needs, which in turn affects the degree of engagement in the task and the learning process (Minnaert and Odenthal, 2018).

In this study, we will look at what it takes—from the student's perspective—to be able to engage with learning at school. We will broadly outline what children say they need to be engaged and then look at differential differences between gifted students and students of average intelligence in terms of what they say they need to become and stay engaged.

Research question 1:

What do students need to be engaged with learning at school?

Research question 2:

Are there any differential differences in the fulfillment of basic psychological needs between gifted students and students of average intelligence in terms of what they say they need to become engaged with learning in school, considered from the perspective of both 'the self' and the context? If so, what do these differential differences entail?
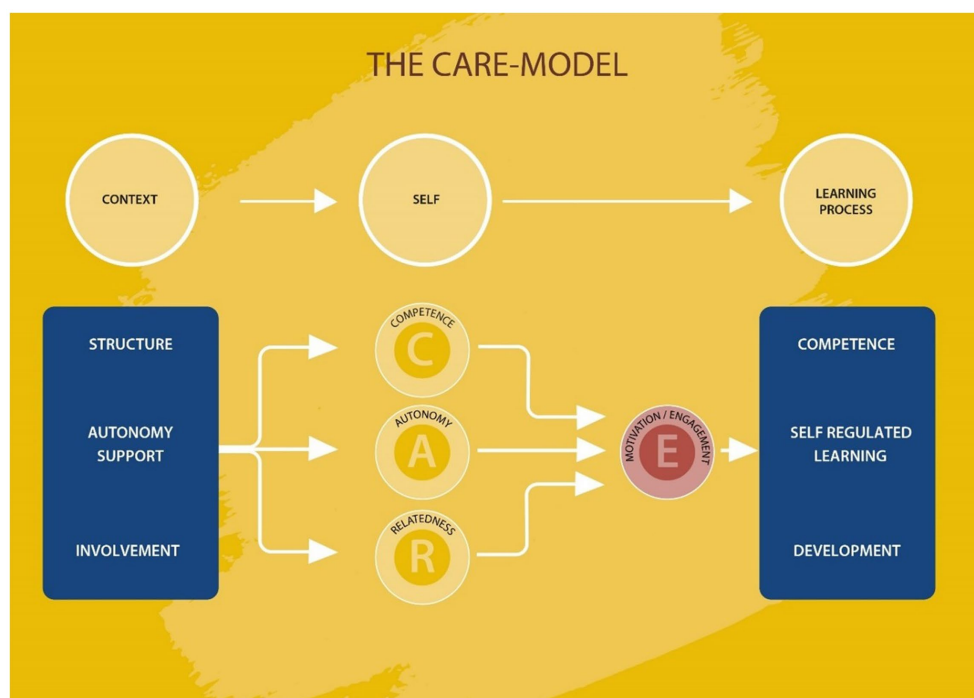

FIGURE 1
The CARE model, theoretical framework. Slightly adapted version with permission from Minnaert (2005, p 53).

Research question 3:

Are there any differential differences in the fulfillment of basic psychological needs between gifted students and students of average intelligence in terms of what they say they need to stay engaged with learning at school even if they experience resistance, considered from the perspective of both 'the self' and the context? If so, what do these differential differences entail?

Methodology

To gain the best possible insight into what it takes for students to become and stay engaged with learning and whether gifted students differ from their counterparts of average intelligence in this respect, mixed methods were used, both qualitatively (for the first research question) and quantitatively (for research questions 2 and 3).

Quantifiable data were collected through intelligence tests and some open-ended questions that explored the students' ideas of what they needed to become and stay engaged with learning at school, which were analyzed to answer the specified research questions.

Sample

In this study, which ran from 2015 to 2021, 53 classes in year 6 (final year in primary education) from 35 schools participated, with an average of 20 students in a group. These schools were 16 regular primary schools and 19 primary schools with a specific educational tradition. The sample reflected both geographic and demographic variations. The 6th formers were taught in the urban agglomeration or medium-sized towns and villages in the middle of the Netherlands. The native language of the students and the researcher was Dutch.

Given the convenience sampling method used to select the schools, the network of the first author, a school psychologist, was used as an initial source.

A total of 1,017 students participated in the study, of whom 512 were girls and 505 boys. The pupils were 11/12 years of age.

The number of gifted students per class varied; in a few classes, there were none, and in others, above average. The ratio of gifted students to the total number of participants was 13.7. Among the participating schools, several schools with a gifted profile included.

To get an overall idea of what students say they need to be engaged with learning at school, the respondents' answers were examined first.

To answer the research question concerning whether there are differences in what gifted students say they need to become and remain engaged compared to students of average intelligence, a selection was made from this sample based on intelligence scores. The selection comprised the answers of the gifted students (Total Intelligence Quotient, TIQ ≥ 120) and those of the students with intermediate-level cognitive abilities (TIQ ≥ 90 and TIQ ≤ 109).

When assessing excellence in the 'intellectual' area of gifted students, the most commonly used threshold is an intelligence quotient (IQ) score of 130 (Vaivre-Douret, 2011). However, according to Pezzuti et al. (2022, p. 2), it appears that the idea of maintaining a lower threshold than 130 IQ points or differentiating even wider performance bands is gaining traction. For example, the definition of 'high-potential' individuals with IQ scores between 120 and 129 could be used (Zanetti, 2017; Sartori, 2019). In addition, according to

Beckmann and Minnaert (2018), in identifying twice-exceptional students (students blessed with a gift and a challenge such as autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), or specific learning disorder), this threshold is often lowered to 120 to account for measurement error (e.g., Silverman, 1989; Burger-Veltmeijer et al., 2011). In this study, we used a cutoff score of 120 on the IQ test to allow for students who are intellectually gifted in, e.g., either the verbal or performance area of intelligence, but also because we did not exclude twice-exceptional students in this study.

The group of gifted students comprised 140 children, 49 of whom were girls and 91 were boys. Their selection was based on TIQ ≥ 120, taking into account the confidence interval.

The group of students of average intelligence comprised 678 children, including 361 girls and 317 boys (see Figure 2). The decision on these contrasting groups in terms of cognitive abilities was made for the purpose of gaining insights into what gifted students may need other than the standard educational offer, which is geared to students of average intelligence.

Measurement instruments

To measure the respondents' level of intelligence, the outcomes of the NIO Dutch Intelligence Test for Educational Level (Van Dijk and Tellegen, 2004; Van Dijk, 2018) were used. The NIO measures verbal intelligence through three verbal subtests and symbolic intelligence through two arithmetic and one spatial subtest. Together, the scores on the six subtests constitute NIO total or NIO intelligence. This test was administered to the classes at the request of the schools.

For each student, the NIO provided data regarding their (dis) harmonic intelligence profile, sex, school type, and whether their class was taught by a male or female teacher. These variables were included exploratively.

After the NIO had been administered by the school psychologist, all respondents were presented with a short series of open questions looking into what primary school students needed to be able to engage in learning at school (questions 1, 2, and 3) and what they needed to remain engaged even when they had to do something that they found difficult or disliked, i.e., if they experienced resistance (question 4):

Question 1: When do you feel like learning or working at school?

Question 2: What do you need to enjoy your schoolwork?

Question 3: Can you give an example of a situation when you enjoyed your schoolwork?

Question 4: What helps you to do your schoolwork if you have to do something that you find difficult or not so much fun?

These questions were essentially based on Ryan and Deci's (2000) SDT and thus derived content validity from the basic psychological needs sub-theory of the SDT. Moreover, the questions were presented to a team of substantive SDT experts.

For the sake of inter-rater reliability, all (partial) answers to question 1—which was answered by 1,017 respondents—were recoded after coding by a school psychologist with knowledge of both giftedness and the SDT. At least 10% of the answers to questions 2, 3, and 4 were randomly recoded. There was immediate agreement on the coding of 93% of the answers, rising to 99% after discussing the items. One answer was disregarded after consultation because it would require additional information to interpret this answer unambiguously.

FIGURE 2
Number of respondents by group and gender.
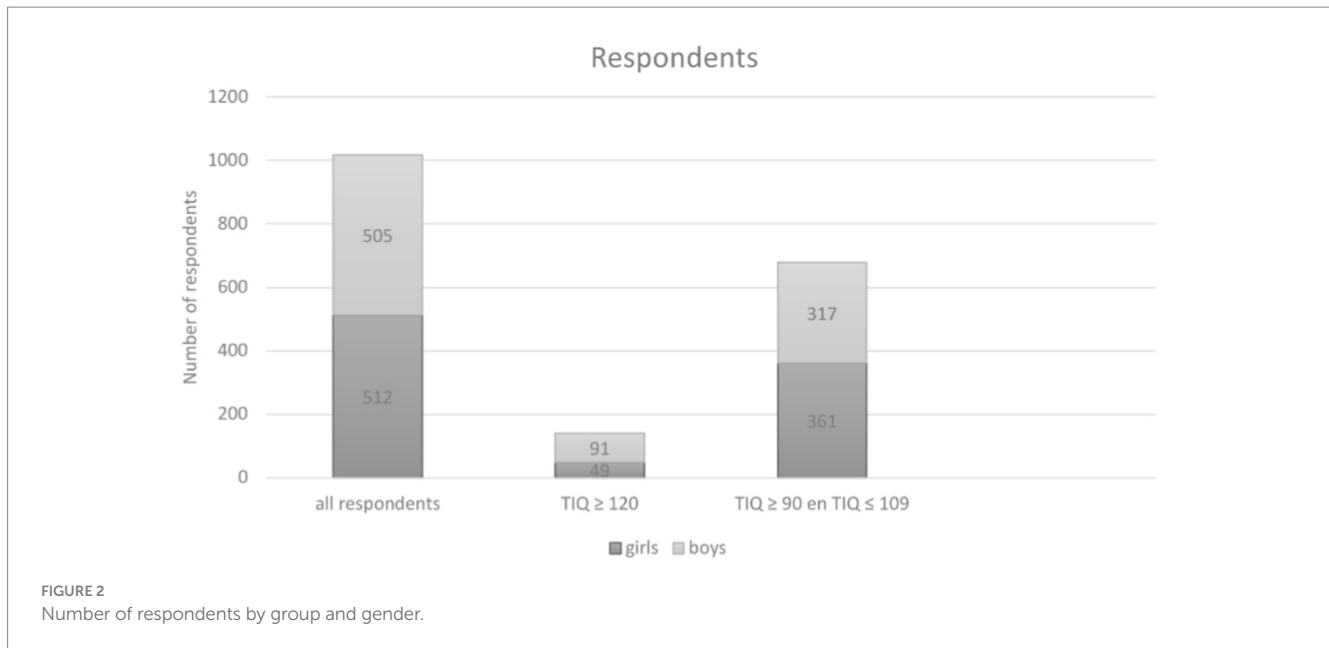
The answers that differed were discussed until an agreement was reached.

Procedure

Before the students completed the questionnaire, the school psychologist/researcher verbally explained that their data would be processed anonymously and that their participation in the study was voluntary. The respondents were informed about the objectives of the study (informed consent). The confidentiality of the data was guaranteed. The data were processed anonymously, and all participants gave active consent to this study. The ethics committee had approved this course of action at the onset of the study.

The questionnaire was completed by all respondents after completing the NIO. This was equal for all classes and schools, namely at the onset of the school year.

In the classroom setting, the students were given a detailed explanation of what the terms 'feel like learning' and 'enjoy working' meant in this context, namely engagement and not motivation. For the sake of readability, given the target group, the word engagement was deliberately omitted from the questions, and the questions were formulated succinctly. It was explained in detail that the questions went beyond 'feeling like' to 'translating this feeling into activity and proceed to action in the classroom.' To clarify the concept of engagement, the researcher gave examples appropriate to the situation of the class concerned by referring to a concrete example whereby engagement became visible to those specific students, for example: 'When I first entered your classroom, you were all hard at work. It looked like a beehive! You were all concentrating on writing. I'm curious what you need to be able to work in this way.' The children were given the opportunity to ask questions until it was clear to everyone what these questions meant. The researcher verified in each class whether the question was indeed clear to every student and provided further clarification where necessary.

To minimize socially desirable responses, before the students completed the questionnaire, it was emphasized that all answers were valuable, that it was important for the study to ascertain how they themselves experienced it, and that their voices would be listened to. The students were asked to give concrete examples—if possible—when they answered the questions to help interpret their answers as well as possible later on. The questionnaire took about 5–10 min to complete.

The questions had been tested for construct validity through a pilot study in several groups of students in the relevant age category, approximating 90 students. This pilot study led to some adjustments in terms of improving the instructions by adding concrete examples.

Because educational practitioners have emphasized that retaining engagement is a specific issue of concern in teaching gifted students and that teachers experience hesitation to act in this respect (Snikkers, 2018), the related question 4 was added later. This question was answered by 649 children. Again, contrast groups were selected from this group of respondents to gain insights into the possible differences between gifted students and students of average intelligence in terms of what they say they need to stay engaged. The group of gifted students comprised 40, and the group of students of average intelligence was 217 respondents.

The group that completed this question was representative of the group that completed the first three open questions, whereby the distribution regarding the percentage of gifted students versus students with an average intelligence level and their sex was exactly the same.

The ethics committee of the Graduate School of Behavioural and Social Sciences University of Groningen (The Netherlands) approved and oversaw the research design (April 2021).

Data analysis

This study examined in various ways whatever students considered important to become and stay engaged with learning at school. For

each research question, we will describe how the data were analyzed below.

Research question 1: What do students need to be engaged with learning at school?

First, we will broadly outline what the respondents said they needed to be engaged with learning at school by analyzing the answers to the open questions presented to the students.

Since the students' voices and perceptions were key, open coding was the first step taken. This involved an open-minded examination of themes, categories, and concepts that became visible through repeated reading and gradually arranging the answers as the children had formulated them. This bottom-up, exploratory approach allowed us to capture the social meaning, rather than how often certain concepts were mentioned (Mortelmans, 2011) that emerged from our respondents' answers; this initial process was followed by analyses in which our respondents' understanding of their needs with respect to engagement in schoolwork was related to pre-existing theoretical concepts of needs related to engagement.

The themes that the children brought to the fore related not only to the students themselves ('the self') but also to the context. The themes related to the students were about how they felt and the conditions for learning within themselves.

The themes associated with the context relate to their teacher, classmates, the educational offer, their home situation, and circumstances.

The themes of primary basic needs, motivational factors in connection with the assignment, and work strategies were also distinguished here.

To capture the nuances in the students' perspectives, the themes were divided into categories, which were then broken down into subcategories (see Appendix A). Keywords (words frequently used by the respondents) were assigned to each subcategory to facilitate coding. The (sub)categories were all given a unique code:

For example: Theme: teacher

Category 1: What the teacher does

Subcategory: Refers to helping and providing explanation

Keywords

Clear explanation/helping

Code: 7

Example: 'If the teacher helps me when I do not understand.'

Subcategory 2: Refers to understanding, seeing or appreciating the student

Keywords

Giving compliments seeing what is needed giving confidence seeing what is going well

Code: 71

Example: 'That the teacher gives compliments.'

Ultimately, a total of 44 different codes were assigned to the students' (partial) answers based on the analysis of the answers (see Appendix A).

If an answer comprised several subcategories, all of the partial answers were assigned the code of their subcategory.

For example: *'If the teacher is nice and if I understand.'* - > code 6, code 221

It was decided to code the subcategories to also perform statistical analyses on the obtained data so that they could also be used to answer the other research questions.

A team of experts looked at the themes mentioned by the children, whereby an overall picture emerged that reflected the children's voices.

Research question 2: Are there any differential differences in the fulfillment of basic psychological needs between gifted students and students of average intelligence in terms of what they say they need to become engaged with learning at school, considered from the perspective of both 'the self' and the context? If so, what do these differential differences entail?

After looking bottom-up from open coding into what is important from the perspective of the student to become and remain engaged, the ensuing overall picture revealed that the children mentioned different themes that corresponded to the constructs from the SDT and the CARE model: these concerned subcategories directly related to the variables of relatedness, competence, autonomy, involvement, an autonomy-supportive environment, and structure.

For each coded subcategory, it was identified whether it related to one of the six variables associated with the SDT and the CARE model: relatedness, competence, autonomy, structure, involvement, or autonomy support (see Appendix B). Consultations have taken place with a team of experts in SDT on how to include the categories within each variable. The literature within this domain of research was leading at this point (Vansteenkiste and Soenens, 2015; Minnaert and Odenthal, 2018). Through this top-down coding using the SDT and the CARE model as bases, a dichotomous database was formed.

For example: Subcategory: The way the teacher explains things (code 7)

- > related variable: STRUCTURE

This database was used for statistical analyses exploring the occurrence and frequency of references to basic psychological needs and their fulfillment in the answers of the gifted students and their counterparts of average intelligence.

The aim was to gain insights into whether and what differences exist between them in terms of what they say they need to become engaged. Several successive steps had to be taken before these statistical analyses could be performed.

To perform analyses with the dichotomous database, the occurrence of the variables in the answers to questions 1, 2, and 3 referring to what the respondents needed to become engaged was added up by the respondent.

To investigate possible interactions—i.e., to find patterns in subgroups—discriminant analyses were performed next (using SPSS version 27). The two contrast groups were taken as the dependent variable in each analysis while looking into possible patterns with respect to the six variables.

To check for a nested structure in the data (class-level nesting), the intraclass correlation coefficient (ICC) was calculated (Field, 2009) as an estimate of effect size indicating the extent to which individual ratings are attribual to group membership on the average scores for each of the 53 school classes on the six composite variables (a 6×53 dataset; Field, 2005; Poe, 2016; De Vet, n.d.). The ICC estimates and their 95% confidence interval were calculated (using SPSS version 27) based on average measurements, absolute agreement, and a two-way random effect model [Field, 2005; Koo and Li, 2016; ICC = 0.020; 95%-CI: from −0.189 to +0.253; F-test with true value 0: $F_{(52, 260)} = 1.039$; $p = 0.410$ (ns)]. Because the ICC value was very small, it could be concluded that the level of class had little effect on the children's scores on the six composite variables and that the outcome

more strongly varied within the classes, making the differences between them relatively small. Therefore, there was no evidence of any nested data to be taken into account.

Research question 3: Are there any differential differences in the fulfillment of basic psychological needs between gifted students and students of average intelligence in terms of what they say they need to stay engaged with learning at school even if they experience resistance, considered from the perspective of 'both the self' and the context? If so, what do these differential differences entail?

To analyze the answers to the question as posed to the students relating to staying engaged, the database was first examined for the numbers of gifted students and students with an average TIQ whose answers to this question related to (one of) the relevant variables, which concerned 40 and 217 students, respectively. Again, possible differences in the frequency of the answers to the six variables between the contrast groups were considered.

A χ^2-square test was used to check for differences in the contrast groups' answers to the six variables and identify such differences.

Results

This study's results first provided a rough picture of what children say they need to be engaged with learning at school, which will be discussed below. We will then focus on the possible differences between gifted children and children of average intelligence in terms of what it takes to become engaged and what those differences entail. Finally, we will reveal what the contrast groups said they needed to stay engaged with learning at school even if they experienced resistance.

Research question 1: What do students say they need to be engaged with learning at school?

The students mentioned a wide array of themes that they considered important to be engaged with learning at school. The open coding showed a clear distinction between factors that influence engagement from within the child (the self) and the context. The factors are divided into main and subcategories (see Appendix A).

'The Self'

One of the categories from within 'the self' is how the child feels, e.g., positive, relaxed, or cheerful, as a condition for becoming engaged.

For example: *'When I am happy, I can work well.'*

'When I got out on the right side of bed.'

Another category from within 'the self' refers to the learning conditions within the child, such as self-confidence, perseverance, patience, concentration, and being prepared.

For example: *'If I believe in myself.'*

'If I can concentrate well, I can also work well.'

Context

The children mentioned various contextual factors. The first category covered the primary basic needs of adequate food and drink, enough sleep, feeling healthy, and hygiene.

For example: *'If I've had enough breakfast.'*

'I can get cracking better when I have freshly washed.'

The next contextual factor was the child's work strategy: asking for help, growth mindset, and reward or offering something to look forward to.

For example: *'Then I think: Come on, you can do it, you just have to think hard.'*

'I want to learn from it, so I want to see my work again to do better.'

Another category concerned motivating factors in connection with the assignment, i.e., interest, self-direction, enjoyment in the task, appropriate level, clear structure, matching the child's pace, challenge, variety, and content that is meaningful to the child.

For example: *'If I find it interesting and it is a fascinating subject.'*

'If I can have my say and do things independently, in my own way.'

The categories of teacher, classmates, educational offer, home situation, and other circumstances were divided into subcategories to give as much nuance to the child's voice as possible.

The teacher category comprised two subcategories: how the teacher is—such as being kind, positive, or cheerful—and how the teacher acts, like being properly helpful and acknowledging and encouraging the student.

For example: *'If the teacher is nice and cheerful, not grumpy.'*

'If I get lovely help when I need it and when the teacher heartens me.'

The same two subcategories applied to the category of classmates, namely how the classmates are—such as being friendly, reliable, or nice—and how the classmates act, like being properly helpful.

For example: *'If I have nice classmates and it is cosy and cheerful in the group.'*

'If children can explain things to each other themselves.'

The educational offer category included several subcategories. The children referred to order, namely being quiet and peaceful in the classroom. They named materials such as headphones or a wobbly cushion and explicitly mentioned sports such as physical education, play during breaks, and games. Certain subjects were raised, such as maths or drama, and finally, the subcategory of special activities, such as camp, birthdays, or outing.

Other subcategories brought up by the students under educational offer were the working method—such as inquiry-based learning, creative work, doing something with your hands, or learning in practice—and the subcategory of the work format, such as a presentation, wall newspaper, or weekly task. In the subcategory of the additional educational offer, the so-called plus group for gifted children and working in small groups were mentioned.

For example: *'If the teacher makes sure it's quiet, it goes much better.'*

'If it is in the form of a game, we can learn.'

Students also gave answers that related to the category of the home situation. This included the subcategory of a stimulating home situation—such as receiving help from relatives—and the subcategories specifically related to the parents in terms of how they stimulate children through involvement and actually help them with homework.

For example: *'If my sister helps me with my homework.'*

'If my mother is happy when I do well.'

The final category covers circumstances. This includes the subcategories of time—with a reference to a certain moment or time—place—references to a certain environment or place—and finally weather conditions, namely mentions of certain temperatures and the weather.

For example: *'After the break!'*

'In a cool room by the window.'

Research question 2: Are there any differential differences in the fulfillment of basic psychological needs between gifted students and students of average intelligence in terms of what they say they need to become engaged with learning at school, considered from the perspective of both 'the self' and the context? If so, what do these differential differences entail?

When focusing on the differences between gifted students and students of average intelligence in their ideas of what is necessary to become engaged and focus on differential differences in the (fulfillment of) basic psychological needs—relatedness, competence, autonomy, engagement, structure, and autonomy support—it becomes apparent that both contrast groups more or less equally alluded that relatedness, competence, and autonomy are important for them to become engaged.

Regarding the conditions in terms of what is needed from the (school) context to meet these basic psychological needs, students from both groups made statements about the need for structural support, involvement, and autonomy support. Although all respondents mentioned these contextual building blocks for engagement, differential differences between the contrast groups were indeed visible in the extent to which these variables were brought up.

The statistical analyses clearly showed that the group of gifted students significantly more often said they needed an autonomy-supportive environment to engage in learning at school than the group with average intelligence. Gifted students referred to the variable of autonomy support significantly more often than the other variables.

Before statistical testing for differential differences, descriptive statistics were performed. A possible relation between the total IQ and the six variables (relatedness, competence, autonomy, involvement, structure, and autonomy support) was examined first. Next, the focus was placed on any differences between the answers of gifted students as opposed to students of average intelligence to gain an answer to the research question. Subsequently, discriminant analysis was used to examine whether there were any differences between the two contrast groups (gifted versus average intelligence) and the variables under study.

From the correlation matrix with six variables and TIQ ($N = 1,017$), it appeared that by far the strongest correlation (0.213) was between TIQ and the need for autonomy support.

To investigate possible interaction effects, discriminant analyses were performed between the two contrast groups (average TIQ $N = 511$, gifted students $N = 140$) to see whether there were differences between the two groups and the six variables.

According to the discriminant analysis, one function registered significant differences between the two contrast groups, as the need for autonomy support was much higher than the other variables examined (Eigenvalue = 0.041, canonical correlation coefficient = 0.20, $\lambda = 0.961$, df = 6, $p = 0.000$).

The variables of sex, disharmonic profile, master-miss, and the type of education were included exploratively, whereby the possible interaction effects between these and the six variables relating to the basic psychological needs were examined.

It was found that none of these dependent variables made a difference: the distances between group centroids did not strongly differ, nor did the percentages of correct classifications.

Regardless of the subgroup, autonomy support was ranked first in all distinctions between the two IQ groups. In fact, this distinction between the two IQ groups was dominant over any other distinction we could make.

The structure matrix with correlations between the two IQ groups' distinction in order of size provided a picture of the mutual strength of the six variables, showing that the need for autonomy support mostly correlates to that distinction (0.930), while competence correlates the least (0.031).

The distinction that discriminant analysis makes between two IQ groups can be seen in the group centroids (average IQ students group:

−0.106, gifted students: 0.385). To visualize how the different IQ groups relate to the six variables, the group centroids have been placed on the same line as the coefficients (see Figure 3).

There are indeed differential differences in the fulfillment of the basic psychological needs between gifted students and students of average intelligence in terms of what they say they need to become engaged with learning at school when viewed from the perspective of both 'the self' and the context. Analyses showed that the need for autonomy support was particularly relevant to the group of gifted students, while we saw a predominant emphasis on relatedness and involvement among their counterparts (see Figure 3).

Research question 3: Are there any differential differences in what gifted students and students of average intelligence say they need to stay engaged even if they experience resistance? If so, what do these differential differences entail?

When asked what they needed to stay engaged with learning at school even if they experienced resistance, all of the children—regardless of their IQ—referred to a structure-supportive environment, whereby this variable was brought up significantly more often than any of the other variables.
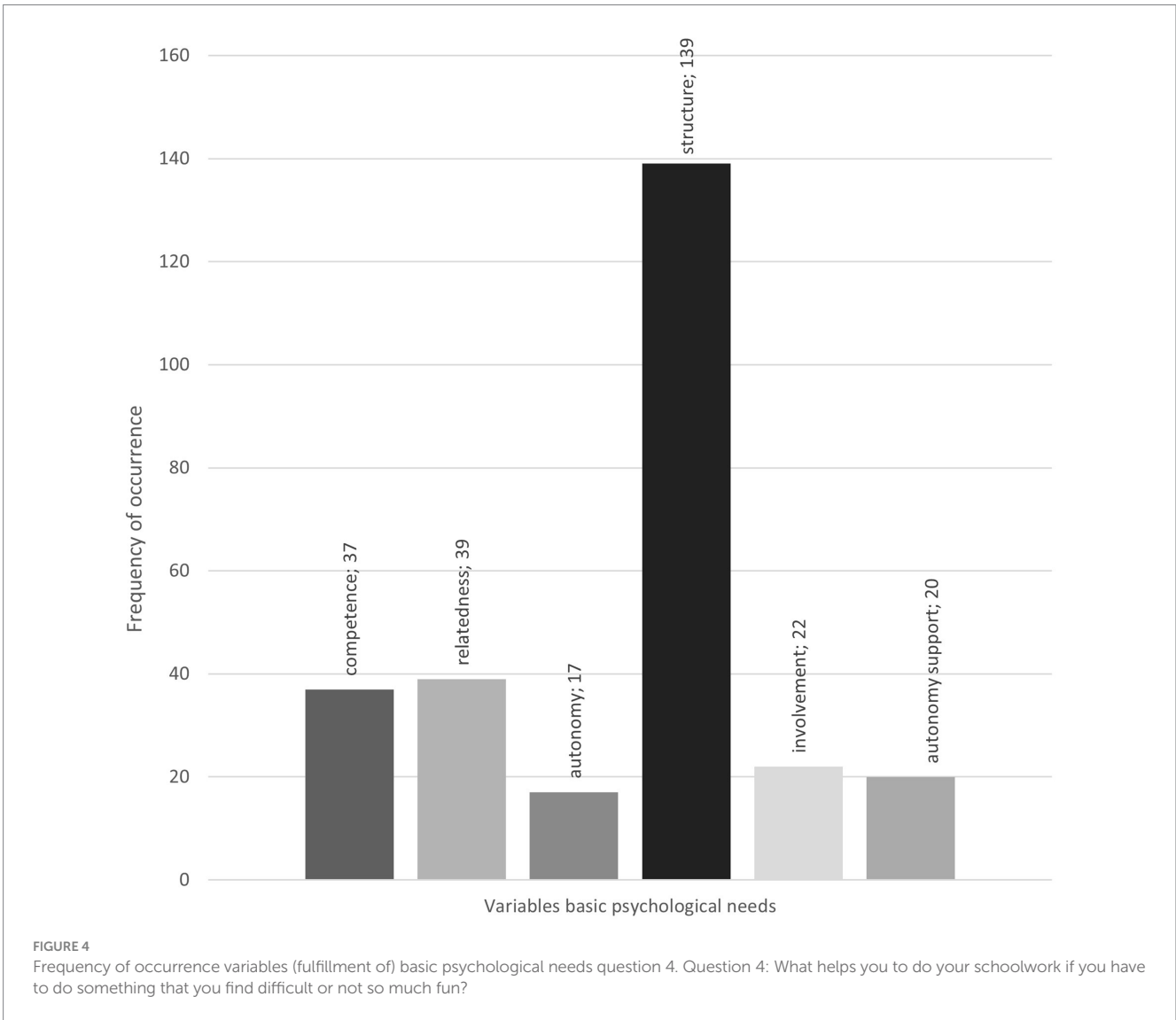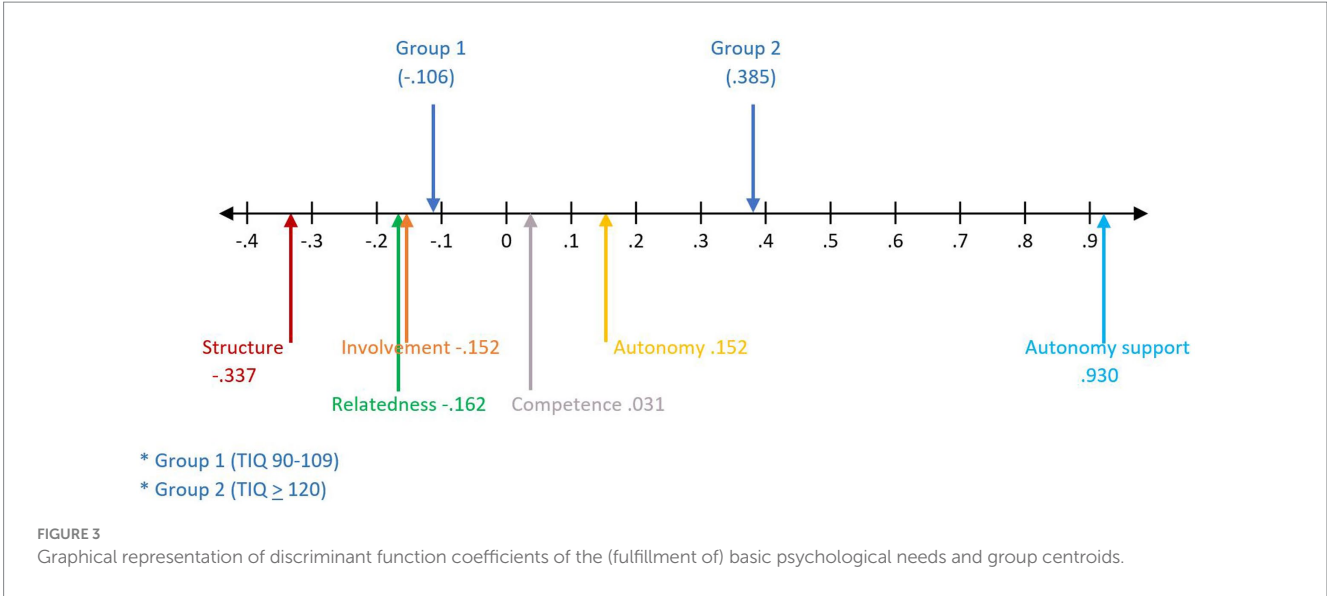
Before running into the χ^2-square test to analyze the data on differential differences, the frequency of occurrence of the six variables was examined. For the 217 students who answered this question, the structural support variable clearly stands out from the rest (see Figure 4), being mentioned significantly more often than the other variables: competence ($\chi^2 = 25.01$, df = 4; $p < 0.001$), relatedness ($\chi^2 = 24.17$, df = 4; $p < 0.001$), involvement ($\chi^2 = 11.52$, df = 2; $p = 0.003$), and autonomy support ($\chi^2 = 28.00$, df = 2; $p < 0.001$). As for autonomy, there were too many cells with a zero frequency score to reach sufficient power and, by consequence, significance ($\chi^2 = 3.36$, df = 2; $p = 0.506$); hence this result should be interpreted with caution. Please note the visually verifiable difference in frequencies (see Figure 4).

There was no differential difference between gifted students and students of average intelligence in what they said they need to remain engaged with learning at school while experiencing resistance. In this respect, both groups referred to structure significantly more often than the other variables.

Discussion

For all students, investing in relatedness, competence, and autonomy remains the basis for promoting engagement in learning. The school context influences the fulfillment of basic psychological needs in terms of meeting the conditions so that children can become engaged. This is in line with the SDT and CARE model. This study shows that for gifted students, it is specifically important to facilitate an autonomy-supportive environment for them to become engaged with learning at school.

The concept of an autonomy-supportive context refers to an environment that encourages students to make appropriate choices in their learning process. It is about the amount of freedom that a student is allowed to determine their own behavior, although the provision of freedom alone does not suffice, as it must come with structure (Minnaert and Odenthal, 2018, p. 27). At school, this means giving students the actual freedom to decide and make choices for themselves regarding both the content of the assignment and its execution.

FIGURE 3
Graphical representation of discriminant function coefficients of the (fulfillment of) basic psychological needs and group centroids.

FIGURE 4
Frequency of occurrence variables (fulfillment of) basic psychological needs question 4. Question 4: What helps you to do your schoolwork if you have to do something that you find difficult or not so much fun?

This can be realized by creating a curriculum that matches the student's level and presents challenges. Gifted students indicated in this study that they benefited from an educational context that encourages them to take an appropriate step forward rather than a curriculum that inhibits their learning development, such as excessive repetition. Tasks that provide depth and stimulate students to think for themselves, 'complicated questions over which you have to rack your brains' and new subject matter would be important in this respect. The students also believed that including a play element in the assignments—in which there is room for personal input to determine direction—would be a helpful component of an autonomy-supportive context that can promote engagement.

To support autonomy, educators try to gear an appropriate context as much as possible to the children's experiential world, adopt a flexible attitude, and try to encourage a sense of initiative in children so that they act, think, and feel voluntarily (Ryan et al., 1995; Soenens and Vansteenkiste, 2010). The basic attitude of autonomy-supportive parenting is curiosity, openness, and a basic trust in the spontaneous, growth-oriented development of children with room for fun, input, interpretation, the voice and rhythm of children, and inviting language (Vansteenkiste and Soenens, 2015). Central to this basic attitude is respect for the individuality of the child.

Rogers (1967) described the importance of children being taken completely seriously and accepted unconditionally, along with their own wishes, ideas, concerns, and complaints. Vansteenkiste and Soenens (2015) argued that input and dialogue are the levers to strengthen the autonomy of children.

To be clear, an autonomy-supportive context is not about being indulgent or simply giving children all the freedom they want, but rather getting to know the interests of children from a curious, open basic attitude and trying to understand how children see things as a point of departure for supporting them in discovering and realizing their emerging interests and values so that the child experiences a sense of inner psychological freedom (Vansteenkiste and Soenens, 2015, p. 506).

Whenever students experience resistance, regardless of whether they are gifted or have average intelligence, they need structure to stay engaged. The point of departure for structured parenting is to have insights and trust in children's talents and skills. By properly assessing the children's abilities, educators can formulate expectations and give assignments that match the child's developmental level and abilities and support their competence needs (Vansteenkiste and Soenens, 2015).

Providing structure in an autonomy-supportive context is about setting clear boundaries that are communicated with empathy and with a reason that is meaningful to the child personally. Children should have a say in the boundaries (Soenens and Vansteenkiste, 2010; Vansteenkiste and Soenens, 2015, p. 531).

To promote engagement in learning in gifted children, explicitly working toward a school context that offers autonomy support is a promising approach. To keep the fire burning when resistance is encountered is the key to providing structure.

As for Emily, the expectation is that as soon as she is offered the freedom to develop in a way that is meaningful to her, she will become engaged with learning at school again. Furthermore, at times when resistance arises, offering a structure aimed at supporting Emily's competence needs will be the fuel to maintain her engagement.

These results show what gifted students need to become and remain engaged with learning and how these needs differ from and coincide with those of students of average intelligence. They specifically show what direction the implications for support in the classroom may take. These apply to gifted students in general. The questions in the educational practice usually concern individual students, such as Emily.

The support for the individual student will still require customization to the unique child. Vansteenkiste and Soenens (2015) state that the starting point for autonomy-supportive parenting is the child itself. Providing an appropriate autonomy-supportive context has thus become an educational issue concerning the unique child in a specific situation (Van Manen, 2015).

Strengths and limitations of the study

The study comprises both strengths and limitations. First, it used a convenience sample from the researcher's work, which offered the advantage of the schools' and respondents' strong involvement in the study, and the researcher was familiar to (most) students. This method was adopted with a view to ensuring that the children's voices takes center stage in this study.

A disadvantage, however, could be possible bias, but we believe the involvement and the large scale more than compensated for this.

Second, as indicated, the group of respondents who answered the open question 4 was relatively small, at least to the extent that they referred to the six variables, thus raising concerns about the statistical analyses. Although we could not perform discriminant analyses due to the limited amount of data, the results of the analyses paint a convincing picture that is useful for supporting students in educational practice.

A third limitation of this study was that respondents were involved only once, which made it impossible to further explore the given answers. This made coding difficult at times, given that the often-short answers did not always provide a clue as to how to interpret them.

Nevertheless, we wanted to do as much justice as possible to the children's different voices. Due to the proximity of the school psychologist—who was familiar to most of the children—and the relational involvement, a lot of data were generated, which is why we believe that we can still give a nuanced answer.

A strength of the study was that the use of a concurrent parallel mixed methods design (Creswell and Plano-Clark, 2018; Minnaert, 2023) allowed for the capture of different but intertwined perspectives, both qualitatively and quantitatively. Through the qualitative approach, research question 1 provides a detailed insight into the general conditions for engagement in learning at school as referred to by the children, which shows that they also highlight the interpersonal side of learning. Based on quantitative research, the findings related to research questions 2 and 3 reveal that differential differences in emphasis emerge on the interpersonal side of learning for gifted students and students of average intelligence. The quantitative results provide depth to the qualitative findings related to research question 1. Overall, the added value of a mixed methods design is clearly demonstrated.

Follow-up research

As for follow-up research, it would be advisable to explore in further depth to gain insights into the needs of the unique, gifted child

to become and stay engaged with learning at school and how to respond to the educational questions that the gifted child puts before the educator, zooming in on the whole story that the child tells. In this research design, we listened to what the children said, but there was little opportunity to inquire intensively into the intentions behind the children's answers.

A second recommendation for follow-up research is to build a more comprehensive picture, including the educational context, and listen to the educator's perspective on the question of what gifted children need to be able to become and stay engaged with learning at school.

Conclusion

A lot of research is done on engagement and also on giftedness, but research about the differences between what gifted children needed to become and stay engaged and what students with and average IQ needed—from the students' perspective—was still lacking.

Hence, the primary purpose of this study was to gain insights into what matters to students for them to be engaged with learning at school **(research question 1)**. We subsequently explored whether there were any differential differences between gifted students and students of average intelligence in terms of what they need to become engaged with learning and what those differences entail **(research question 2)**. Finally, we examined whether there were any differences between gifted students and students of average intelligence in terms of what they said they needed to stay engaged even if they experienced resistance **(research question 3)**.

The overall picture that students painted of these needs revealed factors from both their personal perspectives and the context. The findings of this study highlight what (gifted) children need to become and to stay engaged in school, even in the face of resistance. In case educational practice is able to more adequately align to the psychological needs of children, disengagement, frustration, and eventually drop out might be reduced, and psychological wellbeing at school elevated.

All people universally need the fulfillment of basic psychological needs (Deci and Ryan, 2011), and the results of this study confirm again that both gifted students and students of average intelligence need relatedness, competence, and autonomy as building blocks for engagement in learning at school. However, this study also revealed that there are most certainly differences in how the needs-supporting educational context can promote engagement in gifted students and students of average intelligence, respectively. Compared to students with average intelligence, gifted students were significantly more likely to express a need for an autonomy-supportive context to engage in learning. While this is important for all students, it seems to be a specific issue for gifted students.

Last but not least, we found no differential differences in the answers of the two groups in terms of remaining engaged even when experiencing resistance. It was striking that both groups mentioned structure more often than any of the other variables. In other words, when they experience resistance, all students—regardless of their IQ level—feel the need for structure the most.

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