Who Is Considered Gifted From a Teacher's Perspective?

Feature Article

Who Is Considered Gifted From a Teacher's Perspective? A Representative Large-Scale Study

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Abstract

Teachers play important roles in identifying and promoting gifted students. An open question is: Which student characteristics do teachers use to evaluate whether a student is gifted or not? We used data from a representative sample of Dutch primary school teachers (N = 1,304) who were asked whether or not they thought the students (N = 26,720) in their class were gifted. We investigated students' cognitive and noncognitive attributes as well as demographic factors that might be relevant for this judgment. In sum, the findings revealed that teachers considered students to be gifted when, in comparison with their peers, students were superior in cognitive domains, especially with respect to academic achievement, scored higher on openness to experience and lower on agreeableness, were male, were younger, and came from families with higher parental education. These findings are discussed in relation to research on teacher nominations, teachers' representations of giftedness and gifted students, and theoretical conceptions of giftedness.

Keywords

teacher judgment, cognitive and noncognitive factors, demographic variables

There are different ways to identify gifted students in research and practice. Both standardized measures and nominations (e.g., by peers, parents, or teachers) are used to identify gifted students to enroll them in special programs (Hodges et al., 2018). Teacher nominations often provide the first step toward identifying gifted students, who are then tested with standardized achievement or intelligence tests. If these tests support the teachers' nominations, the students often then gain access to specific support programs, such as acceleration, grouping, or enrichment, to further increase their achievement (e.g., Lubinski, 2016).

An important question concerns what factors teachers take into account when assessing whether the students in their class are gifted or not when no reference was made to a special program. Empirical research on this topic employing the use of representative data sets and standardized measures is scarce. In the literature, on the one hand, there is research on teachers' beliefs about giftedness, and on the other hand, there is research on teachers' nomination behavior (i.e., when they select students for special education programs). In both lines of research, cognitive abilities, learning-related variables, and personality traits matter (Baudson & Preckel, 2013, 2016; Golle et al., 2018; Hunsaker et al., 1997; Matheis et al., 2017). However, contradictory evidence exists for the role of social and emotional competencies. Recent studies have revealed that teacher beliefs of giftedness are associated with high neuroticism, low agreeableness, and low extraversion (Baudson & Preckel, 2013, 2016; Matheis et al., 2017). By contrast, research on teachers' nomination behavior has shown that teachers select students who are emotionally stable (Golle et al., 2018; Hunsaker et al., 1997). Furthermore, teacher nominations have been shown to be biased when it comes to students' gender and family background (McBee, 2010; Petersen, 2013; Ricciardi et al., 2020; Rothenbusch et al., 2016).

Neither line of research offers a direct understanding of the student-related factors teachers take into account when deciding whether a child is gifted or not. On the one hand, the findings on teachers' beliefs might reflect evidence of an extreme stereotype about the gifted ("mad genius"; Baudson, 2016) that indicates a rather general belief about giftedness (i.e., with no specific child or program in mind) without influencing actual teacher behavior. On the other hand, the

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findings from the nomination literature might be affected by program requirements because teachers might adapt their choices to these requirements and select the students who are most likely to be successful in a certain program. Thus, teachers' nominations for special programs may be "confounded" with the requirements of the program.

In this study, we investigated which student characteristics—in the real world—are important for teachers' decisions about whether they consider a given child to be gifted or not when no reference was made to a special program. We used a representative data set from the Netherlands, including demographic information, achievement test scores, an ability measure, noncognitive attributes of students, and teachers' assessments of whether or not the students were gifted.

Theoretical Conceptions of Giftedness

There are several definitions of giftedness. The traditional, rather one-dimensional approach equates giftedness with very high levels of general cognitive ability (e.g., IQ equal to or greater than 130; Wirthwein et al., 2011). This conceptual framework has a long tradition (Terman, 1925), with giftedness considered to be a relatively stable personal attribute or trait. In recent decades, there has been a paradigm shift in giftedness research from a trait perspective to process models (Dai & Chen, 2013). Giftedness has been described as a multidimensional construct encompassing several personal characteristics, such as high general cognitive ability, creativity, and motivation (e.g., three-ring conception; Renzulli, 1978). Many conceptualizations suggest that outstanding domain-specific potential or skills may develop over time and result in high performance and productivity (e.g., Gagné, 2013; Heller, 2005; Preckel et al., 2020). The development of a person's potential is assumed to be influenced by internal and external or environmental factors, including one's peers, family, and school (for an overview of conceptualizations, see Sternberg & Ambrose, 2021; Sternberg & Davidson, 2005; Subotnik et al., 2011). According to these theories, domain-specific excellence can be achieved when person and environmental factors interact in an effective way (e.g., Preckel et al., 2020; Subotnik et al., 2017). In all of these conceptualizations, giftedness is considered a resource belonging to a person; if gifted or talented individuals are appropriately encouraged, their initial potential can develop into domain-specific achievement and excellence later on (Lubinski & Benbow, 2021).

Identification of Gifted Students in Research and Practice

Against these conceptual backgrounds, there are different approaches for identifying gifted students in research and practice. Overall, the suggestion is to use several measures (McBee et al., 2014). The traditional standardized measures used in research are intelligence or achievement test scores, whereas the traditional nonstandardized measures used in practice are teacher nominations (Hodges et al., 2018). For standardized measures (e.g., Carman, 2013; Worrell, 2009), cutoff scores are commonly used to select up to 10% of the population at the higher end of the distribution.

Teachers often play a central role in the process of identifying gifted students. It is much more complex to understand the factors that teachers use when judging students as gifted because these nominations might be affected by teachers' individual conceptualizations of giftedness (Sternberg & Zhang, 1995). Therefore, we briefly review the literature on teachers' beliefs about giftedness and teacher nomination behavior.

Research on Teachers' Beliefs About Giftedness and Gifted Students

In giftedness research, the terms attitudes, beliefs, stereotypes, and conceptions are widely used to refer to mental representations of giftedness and gifted people (Baudson & Preckel, 2013, 2016; Carman, 2011; Carrington & Bailey, 2000; Heyder et al., 2018; Makel et al., 2015; Matheis et al., 2019; Preckel et al., 2015). In the following, we review the literature and use the most common term—*beliefs*—to refer to cognitive representations of giftedness and gifted people.

Historically, research on teachers' beliefs about giftedness developed out of research on beliefs about intelligence (e.g., Garcia-Cepero & McCoach, 2009; Sternberg et al., 1981; Sternberg & Zhang, 1995). Early studies revealed a positive picture of people who are highly intelligent. Intelligence was found to be associated with practical problem-solving ability, verbal ability, and social competence (Sternberg et al., 1981). For giftedness, similar findings have been reported (e.g., Berman et al., 2012; Bishofberger, 2012; Dahme & Eggers, 1988; Endepohls-Ulpe & Ruf, 2005; Hany, 1993, 1997; Hunsaker, 1994; Neumeister et al., 2007; Şahin & Düzen, 1994). The most important indicators of giftedness for teachers were found to be cognitive, motivational, and social skills. Furthermore, giftedness and high abilities were found to be associated with rather positive personal attributes. Persson (1998) even used the phrase "paragons of virtue" (p. 181). However, in a few studies, negative attributes of gifted people were also reported. For instance, Lee (1999) found that giftedness was associated with excellence in one or several domains as well as with motivation, but giftedness was also associated with immaturity (emotionally, socially, or both) and asynchrony (e.g., in nonacademic areas, a lack of physical ability). Moon and Brighton (2008) found that teachers could easily imagine that gifted children could have poor social skills, could be shy, could misbehave in school, but could also have a high social intelligence. The most recent findings revealed that, compared with average ability

children, gifted children were assessed as being more able, more open to new experiences, more introverted, less emotionally stable, less agreeable, less prosocial, and more maladjusted (Baudson & Preckel, 2013, 2016; Matheis et al., 2017, 2019).[1]

Although the existing empirical data described above have provided convincing evidence that gifted people (as determined by very high cognitive abilities) are above average in several domains, contradictory beliefs about giftedness seem to exist, known as the harmony and disharmony hypotheses (Baudson & Preckel, 2016). According to the harmony hypothesis, gifted students are considered superior in all domains, that is, they exhibit high general cognitive ability, are highly motivated, are creative, and have strong social abilities (i.e., giftedness as a resource; for example, Endepohls-Ulpe & Ruf, 2005; Persson, 1998). According to the disharmony hypothesis, although gifted students are believed to exhibit high general cognitive ability, as in the harmony hypothesis, they are also considered to be emotionally and socially fragile (i.e., giftedness as vulnerability; for example, Becker, 1978; for a review, see Neihart, 1999).

The most recent findings support the latter hypothesis by providing evidence of negative beliefs on average (Baudson & Preckel, 2013, 2016; Matheis et al., 2017). Possible explanations for this negative conception of giftedness are negative stereotypes in the media ("nerds"), the greater salience of people who are highly cognitively able but socially impaired, and the use of the gifted label as an explanation for problematic behavior (Bergold et al., 2021; Freeman, 2006). It seems that misconceptions about giftedness result in more negative attitudes toward gifted students (Heyder et al., 2018). Nevertheless, there are meaningful individual and even context-dependent differences in teachers' beliefs about giftedness (Lassig, 2009; Preckel et al., 2015). The roles that such conceptions play in determining actual nomination behavior are not clear, but they may matter when it comes to selecting students for special programs for the gifted.

Teachers' Nominations of Gifted Students for Special Programs

Research on teachers' nominations of gifted students has a long tradition (Gagné, 1994; McBee et al., 2014, 2016; Pegnato & Birch, 1959; Rothenbusch et al., 2018). Differences between teacher nominations and IQ measures have been viewed as evidence for the low quality of teacher nominations in the literature in the last 60 years. The majority of recent studies have pointed out that teachers are relatively successful at judging students' intelligence (see the meta-analysis by Machts et al., 2016), but teachers cannot identify gifted underachievers. Solely comparing teachers' nominations of gifted students and intelligence test results neglects the fact that other factors might also be relevant for the identification of gifted students (Hanses & Rost, 1998; Renzulli & Delcourt, 1986). Therefore, we did not focus on the accuracy of teacher nominations in the current study; rather, we focused on the variables that were used to identify gifted students.

In previous studies that investigated teachers' nomination behavior, students' characteristics were compared between those who were actually nominated for a special program and those who were not nominated (e.g., Golle et al., 2018; Rothenbusch et al., 2016), or fictional child profiles were provided and teachers were asked to decide whether they would nominate these students (e.g., Hany, 1993). Among other factors, the following variables were found to be relevant for teachers' decisions to nominate certain children for special programs: school achievement, cognitive abilities, creativity, intellectual curiosity, learning quickly, working behavior, achievement motivation, verbal skills, persistence, and social skills (e.g., Busse et al., 1986; Guskin et al., 1992; Hany, 1993; Hoge & Cudmore, 1986; Hunsaker, 1994; Peterson, 1999; Siegle & Powell, 2004). On the contrary, Neumeister et al. (2007) noted, "Some teachers listed behavioral problems as reasons to question a child's qualification for gifted services" (p. 489). In more recent studies, teachers' nominations of students for specific programs were investigated in relation to students' actual characteristics as assessed with standardized questionnaires and achievement tests (e.g., Foreman & Gubbins, 2015; Golle et al., 2018; Kornmann et al., 2015; Rothenbusch et al., 2016). For a math program, for example, math ability and general cognitive abilities were most relevant (Foreman & Gubbins, 2015). For a STEM enrichment program, intelligence test scores, family background (Rothenbusch et al., 2016), motivational factors, openness to experience, school achievement, and academic self-concept were relevant (Golle et al., 2018).

Besides psychological factors, students' demographic characteristics (e.g., gender, socioeconomic status [SES], ethnicity, and age) seem to be relevant for a teacher's decision to nominate a student for a special program for the gifted (e.g., Bianco et al., 2011; Endepohls-Ulpe & Ruf, 2005; Hernández-Torrano et al., 2013; McBee, 2006, 2010; Petersen, 2013; Ricciardi et al., 2020; Rothenbusch et al., 2016). These studies' findings have revealed that some groups of students had a higher chance of being selected by their teachers (but see also Baudson et al., 2016; Hernandez-Torrano & Tursunbayeva, 2016): boys (Petersen, 2013), students from families with high SES (McBee, 2006; even when general cognitive ability was controlled for, Rothenbusch et al., 2016), students belonging to a nonminority ethnicity (McBee, 2010), as well as relatively young students (Hernández-Torrano et al., 2013).

In addition to using intelligence and achievement, teachers are especially likely to use positive psychological criteria to select students for special programs for the gifted (e.g., Golle et al., 2018; Hany, 1997; Hunsaker, 1994). One could argue that, on average, teachers' nominations of students appear to be in line with theoretical conceptions about giftedness and the harmony hypothesis but with a bias related to

students' background. If students are selected for special programs, it is possible that the students who are chosen are those who might have a higher chance of excelling in the program from the teacher's perspective. This might explain why these students are not emotionally fragile or less agreeable and why teachers favor certain groups of students (e.g., students from families with high SES) over others. The questions are whether teachers' judgments of giftedness are in line with the harmony or disharmony hypothesis and whether they are biased in terms of demographic characteristics when teachers do not select students for a special program.

The Present Study—Who Is Considered Gifted?

Research on teacher beliefs and teacher nomination behavior has provided partially contradictory findings on which student attributes are relevant for teachers' decisions about whether a child is gifted or not. Some findings, mostly from research on teacher nomination behavior, have supported the assumption that giftedness is positively associated with both cognitive and noncognitive attributes of people. However, other studies, mostly on teachers' general beliefs about giftedness, have shown support for the assumption that giftedness is associated with high general cognitive abilities but emotional fragility. Furthermore, differences in the roles played by students' gender, family background, and age exist. Whereas the literature on teacher nominations has reported disadvantages for girls and students from low SES families (e.g., McBee, 2010; Petersen, 2013), biases in teachers' beliefs with respect to students' gender or family background were either not explicitly addressed in this literature or there was no evidence of such biases (e.g., Berman et al., 2012; Bishofberger, 2012; Dahme & Eggers, 1988; Hany, 1993).

There is no simple explanation for why the findings from these two lines of research differ. On one hand, the negative stereotype might not affect nomination behavior, but on the other hand, teachers might adapt to the requirements of the programs and select the gifted students who are most likely to be successful. In addition, different designs, measures, and samples have been used in these studies. Although teachers' beliefs and nomination behavior have been investigated in many studies, the samples were rather small or not representative of a particular population. In addition, the measures for assessing the students' attributes were not standardized, or there were no measures of students' actual characteristics (e.g., motivation or school achievement).

In this study, we used a representative data set from the Netherlands, including all primary schools from a specific region, and asked in-service teachers whether they thought each student in their class (Grade 6, final year of primary school) was gifted or not. Dutch primary school teachers teach all subjects to all students within a given grade (i.e., they are considered class teachers). The question for the teachers about whether they thought a student was gifted was not used to select students into special education programs for gifted students, nor were specific programs or definitions of giftedness mentioned. The data set comprises information about students' cognitive skills, a wide range of noncognitive factors, and students' socioeconomic background. Variables for this study were selected on the basis of relevant factors identified in the literature on teachers' beliefs as well as the nomination literature. We used school achievement and general cognitive ability as well as personality traits (i.e., conscientiousness, agreeableness, neuroticism, openness, extraversion), academic self-concept, and demographic characteristics (i.e., age, gender, family background) in this study.

Research Question

The specific research question we addressed was as follows:

> **Research Question:** What variables significantly predict teachers' judgments?

We decided to address this question in three consecutive steps. First, we created models in which every single student characteristic predicted the teachers' judgments. Second, we controlled for school achievement in these models. Third, we analyzed a model that included all the predictor variables simultaneously. We used this procedure because we wanted to uncover the unconditional associations between the giftedness judgment and every single predictor as well as the predictive power of the variables over and above school achievement. We controlled for school achievement because the teachers knew the students' achievement test data and this is one of the most important cognitive variables for determining giftedness. In the final model, we included all predictors simultaneously to identify the unique contribution of each predictor for the judgment.

To derive specific hypotheses, we referred back to the literature. A core element of the research reviewed above is that giftedness is associated with high general cognitive or domain-specific potential as well as school achievement. Thus, these factors should be strongly associated with the teachers' judgments. Also, motivational variables (e.g., achievement motivation, academic self-concept) as well as some personality attributes (e.g., working hard, being persistent, openness) were considered important across several samples of teachers (Baudson & Preckel, 2016; Berman et al., 2012; Dahme & Eggers, 1988; Golle et al., 2018; Hany, 1993; Neumeister et al., 2007). Thus, we expected that learning-related noncognitive factors (i.e., academic self-concept, conscientiousness, openness) would be relevant for teachers, too. The roles that agreeableness, extraversion, and neuroticism play are less clear. According to the literature on beliefs, high neuroticism (i.e., low emotional stability), low agreeableness, and low extraversion may matter for the teachers

Table 1. Cohorts—Sample Sizes (N = 26,720).

Year	2011	2012	2013	2014	2015
Students (*n*)	5,479	5,586	5,447	5,163	5,045
Teachers (*n*, classes)	274	273	257	259	241
Schools (*n*)	208	208	199	197	182

because this pattern of personality traits reflects, on average, a rather negative stereotype (Baudson & Preckel, 2013, 2016; Matheis et al., 2017). However, according to the nomination literature, these variables do not seem to matter, at least not in a negative expression (Golle et al., 2018). As the judgment in this study did not refer to a specific program, we expected to find evidence for the negative stereotype (low agreeableness, low extraversion, and high neuroticism).

The association between demographic variables and the giftedness judgment is also not clear. Referring to the literature on beliefs, students' gender or family background should not be associated with the giftedness judgment after school achievement is controlled for. However, the literature on teachers' nomination behavior indicates disadvantages for specific groups, such as girls (Petersen, 2013) and students from families with low SES (McBee, 2006; Rothenbusch et al., 2016). As the judgment was freed from any program requirements, we did not expect students' gender or family background to matter after students' ability was controlled for. For students' age, we expected that younger students would more often be considered gifted compared with older students when showing the same ability because the younger students would be considered cognitively precocious relative to their age (comparison with same-age peers in favor of the gifted; for example, Endepohls-Ulpe & Ruf, 2005; Hany, 1995; Lubinski & Benbow, 2021; Neumeister et al., 2007; Şahin & Düzen, 1994).

Method

Procedure and Participants

The data used for this study stemmed from the OnderwijsMonitor Limburg (OML), an ongoing study being conducted in schools in Limburg, a region in the Southern Netherlands.[2] In the Supplemental Appendix, we provide a brief overview of the Dutch education system. A unique feature of this cohort study was that almost all schools in the region (95%) participated, implying almost full coverage of students. We examined multiple cohorts of students in their final year of primary school (Grade 6). The different cohorts stemmed from the school years 2010/2011 to 2014/2015. At the beginning of each school year, schools provided basic demographic information about the students. In early spring (February/March), students took standardized academic achievement tests. In March/April, students, parents, and teachers were surveyed after the achievement tests had been administered. Permission to collect the data was granted by the Maastricht University Ethics Review Committee Inner City Faculties (ERCIC_092_12_07_2018).

Students completed the survey in class under their teacher's supervision. A full hour was reserved for the surveys, with the first half hour consisting of a general cognitive ability test. Teachers completed a brief, one-page survey about behavioral aspects of each student in the class, including whether the student had special support in place (e.g., dyslexia), whether the teacher considered the student to be gifted, and a few student's competencies (e.g., social skills, motivation to learn).[3] The survey did not contain any other information (i.e., no information about the teacher). Parental survey data were collected via the schools. The teachers sent the surveys to the parents and collected them back. The variables we considered in our study were the ones that had been identified as relevant in the previously reviewed literature.

In total, we collected data from 26,720 students and 1,304 teachers (for an overview of the sample size in each cohort, see Table 1). We collapsed the data from the different cohorts so that we had a substantial number of students who were considered gifted. To control for potential cohort differences, we included dummy variables for the cohorts in our statistical models. In the Supplemental Appendix, we provide descriptive statistics for all measures in each cohort and present significant differences between the cohorts. On average, the students were 12.1 years old (SD = 0.5), and 49% of the sample was male (see Table 2).

Measures

Outcome Variable. In the teacher questionnaire, a table was used to briefly assess the students' characteristics and classroom behavior. One question was about giftedness ("Do you think this child is gifted or not?"; 1 = *yes*, 0 = *no*). There was no mention of a specific program for gifted students, nor was proof of the giftedness required.

Predictor Variables

Demographic Information. Demographic information about the students, including birthday (day, month, year) and gender (1 = *boys* vs. 0 = *girls*), was provided by the school boards. As part of the parental survey, parents were asked to indicate the highest level of education completed by each parent. The response scale was 1 = *primary education*, 2 = *lower secondary education*, 3 = *upper secondary education*, 4 = *higher vocational education*, and 5 = *university*.

Table 2. Descriptive Statistics.

	Entire sample ($N = 26{,}720$)				Teacher indicated child as not gifted ($n = 18{,}395$)		Teacher indicated child as gifted ($n = 493$)	
Variable	*M*	*SD*	Reliability	Missing rate	*M*	*SD*	*M*	*SD*
Age	12.09	0.49		.00	12.10	0.49	11.75	0.48
Boy	0.49	0.50		.00	0.48	0.50	0.67	0.47
Parental education	3.49	1.00		.35	3.45	1.00	4.21	0.82
General cognitive ability	32.03	4.76	.73	.16	31.93	4.72	35.24	3.64
Academic achievement	536.67	9.11		.05	536.37	9.04	547.24	5.38
Personality								
Agreeableness	4.07	0.44	.57	.15	4.07	0.44	4.06	0.39
Conscientiousness	3.20	0.51	.55	.15	3.20	0.51	3.22	0.50
Extraversion	2.60	0.33	.51	.15	2.61	0.33	2.56	0.32
Neuroticism	2.53	0.73	.71	.15	2.53	0.73	2.51	0.72
Openness	3.33	0.42	.59	.15	3.32	0.42	3.59	0.41
Academic self-concept	2.82	0.32	.69	.15	2.82	0.32	2.99	0.30

We used the score from the parent with the highest level of education in our study.

General Cognitive Ability. We measured students' fluid reasoning skills via a Dutch nonacademic cognitive abilities test (Niet Schoolse Cognitieve Capaciteiten Test [NSCCT]; van Batenburg, 2015). The test consisted of 43 puzzle or matrix tasks composed of geometric shapes and patterns. In 19 items, students were asked to combine an initial shape with one of four additional shapes so that the combination would result in a perfect square, circle, or triangle. The task for the remaining 24 items was to find "the odd one out" in a series of four geometric shapes. Each item was scored 1 (*correct*) or 0 (*incorrect*). We used the sum score from this test in further analyses. To test whether such a sum score was appropriate, we specified a Rasch model in Mplus 8 and used the weighted least square mean and variance adjusted (WLSMV) estimator (Muthén & Muthén, 1998–2017). The root mean square error of approximation (RMSEA) was .058, indicating that it was acceptable to use the sum score in further analyses (Glöckner-Rist & Hoijtink, 2003). The internal consistency reliability of the scale was .73, 95% confidence interval (CI) = [0.73, 0.74].

Academic Achievement. Academic achievement was measured with the Eindtoets Basisonderwijs for Grade 6 (van Boxtel et al., 2011). This test was developed and assessed by Centraal Instituut voor Toets Ontwikkeling (CITO), an independent testing company. The CITO test is a 3-day standardized achievement test that is used to determine students' secondary education track. Therefore, this test has high stakes for the students. The test consists of multiple-choice questions in different subjects. When these data were collected, this test was not (yet) compulsory for all schools, but about 85% of primary schools had their students take the test.[4] A composite score was created from six different scales: language, mathematics, geography, history, nature, and study skills. A student's overall result is presented as a truncated score ranging from 500 to 550. The internal consistency reliability of this composite score has ranged from .94 to .95 over the years (CITO, 2011–2015). We used this scale without the truncation to avoid ceiling and floor effects. This led to test scores ranging from 494 to 557 points.

Noncognitive Variables. The regional monitoring was collaboratively designed by researchers, teachers, and school principals, as one of its goals was to monitor aspects of education that could help these professionals improve their educational processes. This type of co-creation process is complex, and a balance must be achieved between scientific rigor and practical relevance and applicability (see Penuel & Gallagher, 2017). Therefore, the measures were the result of compromises between researchers and educational professionals, although the questions were drawn from existing externally validated scales. The items have changed somewhat over the years as the researchers have tried to improve model fit where necessary, and different parts of the regional monitoring (i.e., surveys at different points in students' careers) have recently become better aligned. The Supplemental Appendix provides the wording of the items that were selected from all cohorts for this study.

Personality Traits. To assess students' personality, items were developed to capture the Big Five personality traits according to McCrae and Costa (1996). In our study, we used the items for all traits that were administered in every cohort. Neuroticism, conscientiousness, extraversion, agreeableness, and openness were assessed with three items each. Example items are as follows: "I have a lot of ideas" (openness), "I do my homework right away" (conscientiousness),

Table 3. Model Fit for Structural Equation Models.

	Academic self-concept	Agreeableness	Conscientiousness	Extraversion	Neuroticism	Openness
χ^2 (*df*), *p* value	1,210.177 (85), <.001	108.395 (16), <.001	153.532 (16), <.001	93.259 (16), <.001	370.498 (16), <.001	226.296 (16), <.001
CFI	.932	.982	.973	.977	.965	.960
TLI	.940	.983	.975	.978	.967	.963
RMSEA	.054	.036	.043	.033	.070	.054
SRMR	.044	.027	.026	.023	.036	.039

Note. Whereas the CFIs and TLIs were good for all models, the χ^2/df was not acceptable. But it is not uncommon for the model fit indices to provide contrasting information (see Barrett, 2007). It should be noted, however, that the χ^2 tends to be inflated in large samples (Kenny et al., 2014). CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

"I like to receive attention" (extraversion), "I empathize with people" (agreeableness), and "I often think something will go wrong" (neuroticism). The response scales ranged from 1 (*certainly not*) to 5 (*certainly*).

To collapse the data from different cohorts, we first tested the assumption of strong measurement invariance across all cohorts (same loadings and intercepts across cohorts; Vandenberg & Lance, 2000). We applied structural equation modeling (SEM) and used cluster-robust standard errors at the class level (McNeish et al., 2017) implemented in Mplus 8 (Muthén & Muthén, 1998–2017). To handle missing values and to account for the nonnormal distribution of the variables, we used full information maximum likelihood (FIML) estimation with robust standard errors (MLR; Muthén & Muthén, 1998–2017). To evaluate the model fits, we applied commonly used fit indices for latent variable models, namely, the Satorra–Bentler scaled chi-square test (Satorra & Bentler, 2010), the comparative fit index (CFI), the Tucker–Lewis index (TLI), the RMSEA, and the standardized root mean square residual (SRMR; Hu & Bentler, 1998). According to Hu and Bentler (1999), a good fit is indicated by CFI/TLI ≥ .95 and RMSEA/SRMR ≤ .05. For all personality traits, we were able to assume strong measurement invariance. For more details about the model fits, see Table 3.

To compute the reliability coefficients on the collapsed data, we specified one measurement model for each personality trait and used the formula provided by Raykov (2012) in Mplus 8 by means of model constraints. The internal consistency reliabilities for each scale were .59, 95% CI = [0.58, 0.60] (openness), .55, 95% CI = [0.54, 0.56] (conscientiousness), .51, 95% CI = [0.50, 0.52] (extraversion), .57, 95% CI = [0.56, 0.59] (agreeableness), and .71, 95% CI = [0.70, 0.71] (neuroticism). The reliabilities for each scale were rather small but comparable with other studies with this age group (see Göllner et al., 2017).

Academic Self-Concept. The original data set included students' self-evaluations of their behaviors and skills consisting of 51 items. In this study, we focused on seven items representing self-evaluated academic skills in school and used them as indicators of academic self-concept. Students were asked to rate themselves on these seven academic skills (e.g., arithmetic, writing). For each item, students were asked to assess how good they are at certain tasks: "I'm good at (a) writing without mistakes, (b) writing an essay, (c) calculating without a calculator, (d) giving a speech, (e) following the daily news, (f) taking part in discussions, (g) reading aloud."[5] The response scales ranged from 1 (*inadequate*) to 4 (*good*). As we did for the personality variables, we applied SEM to test whether the assumption of strong measurement invariance held across cohorts. Table 3 presents the model fit. Then, we collapsed the data and specified one measurement model to compute the reliability coefficient according to Raykov (2012) in Mplus 8 by means of model constraints. The internal consistency reliability of the academic self-concept scale was .69, 95% CI = [0.68, 0.69].

Analysis. Table 2 presents descriptive statistics for the whole sample and for gifted versus nongifted students separately. For the noncognitive variables, the table presents the means and variances of the latent variables. Table 4 presents the correlations between all variables.[6]

Logistic Regression Models. To assess which variables significantly predicted teachers' judgments, we used the general latent variable modeling framework as implemented in Mplus 8 (Muthén & Muthén, 1998–2017). We calculated logistic regression models with latent (noncognitive) and manifest variables (demographics, cognitive ability, school achievement). Using latent variables enabled us to account for the insufficient reliability in the personality scales and to avoid biased parameter estimation. All nonbinary variables were *z*-standardized prior to the analyses. To account for the nonnormal distributions of the variables, we used robust standard errors (MLR). The multilevel structure of the data was taken into account by using cluster-robust standard errors at the class level (McNeish et al., 2017). To handle missing values, we used FIML estimation. In all models, because variables that were not part of a respective

Table 4. Correlation Table.

Variable	1	2	3	4	5	6	7	8	9	10	11
Age (1)											
Boy (2)	.05**										
Parental education (3)	–.21**	.02**									
General cognitive ability (4)	–.13**	–.03**	.16**								
Academic achievement (5)	–.28**	.03**	.32**	.46**							
Personality											
Agreeableness (6)	–.04**	–.25**	.07**	.04**	.09**						
Conscientiousness (7)	.03**	–.08**	.00	.04**	.03**	.28**					
Extraversion (8)	.03**	.10**	–.01	–.05**	–.06**	.10**	–.04**				
Neuroticism (9)	.02**	–.13**	–.05**	–.07**	–.10**	–.02**	–.18**	–.07**			
Openness (10)	–.06**	.07**	.14**	.10**	.22**	.25**	.26**	.11**	.01		
Academic self-concept (11)	–.16**	–.14**	.17**	.11**	.31**	.31**	.27**	.18**	–.11**	.42**	
Teacher assessment											
Gifted	–.11**	.06**	.12**	.11**	.19**	.00	.01	–.02**	.00	.10**	.09**

Note. Correlation coefficients were based on pairwise data.
*$p < .05$. **$p < .01$.

regression model were included as auxiliary variables, the sample size was $N = 26{,}720$.[7]

We analyzed the data in three consecutive steps. First, we analyzed the unconditional relationships between each independent variable (demographic, cognitive, and noncognitive variables) and the dependent variable (i.e., teachers' giftedness judgments; 0 = *not gifted*, 1 = *gifted*) in the first step. Hence, we computed a separate model for each predictor. In a second step, we analyzed the conditional relationships between the predictor variables and teachers' judgments using students' achievement as a covariate. Students' achievement is considered the most relevant characteristic for determining giftedness in the teacher population in research and practice. In addition, the teachers knew the students' achievement data. Hence, these analyses allowed us to assess which variables explained teacher judgments above and beyond school achievement. Finally, we specified a model including all predictor variables simultaneously. Table 5 presents the results from the final analysis because the pattern of findings did not change dramatically across the models (detailed results are presented in the Supplemental Appendix). We added pseudo-R^2 for every model in each table. It is called pseudo-R^2 because in a logistic regression model (logit link), the error variance is fixed to $\pi^2/3$ (for more details, see McKelvey & Zavoina, 1975; Snijders & Bosker, 2012). Therefore, we could not compare R^2 values between models because the total amount of variance depended on the variance explained by the predictors that were included in a model.

In the Results section, we present odds ratios (*OR*s), which are the exponential functions $\exp(\beta_i)$ of the regression coefficients. *OR*s represent the ratio of the odds that a student will be considered gifted when a predictor variable *i* increases by one unit. If $\beta_i = 0$, then $OR_i = 1$, which indicates that students' probability of being considered gifted does not depend on the predictor variable *i* (i.e., there is no significant relationship between the independent and dependent variables). $OR_i > 1$ implies a higher probability of a positive giftedness judgment when the predictor variable *i* increases (i.e., positive association, $\beta_i > 0$). In turn, $OR_i < 1$ means a lower probability of a positive giftedness judgment when the predictor variable *i* increases (i.e., negative association, $\beta_i < 0$). We report the 95% CIs of the *OR* estimates. When the value 1 is included in the 95% CI, there is no statistically significant relationship at $\alpha = .05$.

Table 5. Logistic Regression Model Including all Predictors—*OR* Results.

	Giftedness	
	OR	[95% CI]
Full model		
Age	0.550	[0.472, 0.641]
Boy	1.575	[1.175, 2.111]
Parental education	1.489	[1.270, 1.747]
General cognitive ability	1.288	[1.124, 1.477]
Academic achievement	6.152	[4.016, 9.424]
Agreeableness	0.714	[0.554, 0.922]
Conscientiousness	0.909	[0.705, 1.171]
Extraversion	0.848	[0.695, 1.034]
Neuroticism	1.029	[0.867, 1.220]
Openness	2.199	[1.577, 3.066]
Academic self-concept	0.874	[0.646, 1.184]
Cohort 2	1.127	[0.685, 1.854]
Cohort 3	1.028	[0.562, 1.878]
Cohort 4	0.796	[0.480, 1.320]
Cohort 5	0.671	[0.341, 1.320]
Pseudo (R^2)	.674	
AIC	1,665,832.322	
SBIC	1,666,835.359	

Note. OR = odds ratio; CI = confidence interval; AIC = Akaike information criterion; SBIC = sample-size adjusted Bayesian information criteria.

Results

Analysis Step 1—Unconditional Relationships

As expected, the probability that a student was considered gifted was higher for students with higher academic achievement, $OR_{AC} = 9.921$, 95% CI = [6.827, 14.419], and higher general cognitive ability, $OR_{GCA} = 2.849$, 95% CI = [2.460, 3.299]. Furthermore, students with higher academic self-concept, $OR_{AS} = 2.375$, 95% CI = [2.071, 2.724], had a higher probability of being considered gifted. The same pattern was found for openness, $OR_O = 2.839$, 95% CI = [2.460, 3.277]. Contrary to our expectations, conscientiousness (as a learning-related variable) did not show a significant association with the giftedness judgment, $OR_C = 1.136$, 95% CI = [0.996, 1.295], nor did agreeableness, $OR_A = 1.069$, 95% CI = [0.942, 1.213], neuroticism, $OR_N = 0.891$, 95% CI = [0.793, 1.001], or extraversion, $OR_E = 0.908$, 95% CI = [0.791, 1.043].

Furthermore, all demographic variables were significantly associated with the giftedness judgment. Students had a higher probability of being considered gifted when they were younger, $OR_{Age} = 0.441$, 95% CI = [0.381, 0.512], had parents with a higher level of education, $OR_{PE} = 2.828$, 95% CI = [2.448, 3.266], or were male, $OR_{Boy} = 2.153$, 95% CI = [1.781, 2.603].

Analysis Step 2—Conditional Relationships, Controlling for School Achievement

In this step, we used school achievement as a covariate in the analyses. The previously reported associations with general cognitive ability, $OR_{GCA} = 1.322$, 95% CI = [1.158, 1.509], and openness, $OR_O = 1.479$, 95% CI = [1.280, 1.709], remained statistically significant. The association with academic self-concept, $OR_{AS} = 1.118$, 95% CI = [0.969, 1.289], was no longer significant. For conscientiousness, $OR_C = 0.954$, 95% CI = [0.830, 1.096], extraversion, $OR_E = 1.040$, 95% CI = [0.915, 1.182], and neuroticism, $OR_N = 1.104$, 95% CI = [0.976, 1.249], the associations remained nonsignificant. Interestingly, the association between agreeableness and the teacher judgment was significant, $OR_A = 0.804$, 95% CI = [0.697, 0.929], indicating that equally able students in school had a higher probability of being considered gifted when they were less agreeable than other students.

For the demographic variables, the significant associations of the giftedness judgment with age, $OR_{Age} = 0.543$, 95% CI = [0.470, 0.627], gender, $OR_{Boy} = 2.123$, 95% CI = [1.741, 2.589], and parental education, $OR_{PE} = 1.659$, 95% CI = [1.420, 1.938], remained statistically significant.

Analysis Step 3—Full Model

When we considered all predictor variables simultaneously, the findings revealed a similar pattern as reported above. As expected, academic achievement, $OR_{AC} = 6.152$, 95% CI = [4.016, 9.424], and general cognitive ability, $OR_{GCA} = 1.288$, 95% CI = [1.124, 1.477], uniquely explained variance in the giftedness judgment. In addition, openness, $OR_O = 2.199$, 95% CI = [1.577, 3.066], was still positively associated with the giftedness judgment when all other variables were controlled for. In turn, agreeableness, $OR_A = 0.714$, 95% CI = [0.554, 0.922], showed a negative association with the giftedness judgment, controlling for all other variables in the model. The expected associations between the giftedness judgment and academic self-concept, $OR_{AS} = 0.874$, 95% CI = [0.646, 1.184], conscientiousness, $OR_C = 0.909$, 95% CI = [0.705, 1.171], neuroticism, $OR_N = 1.029$, 95% CI = [0.867, 1.220], and extraversion, $OR_E = 0.848$, 95% CI = [0.695, 1.034] remained nonsignificant.

The associations with the demographic variables were robust. After accounting for all other variables in the model, boys had a higher chance of being considered gifted, $OR_{Boy} = 1.575$, 95% CI = [1.175, 2.111], and so did students who had parents with a higher level of education, $OR_{PE} = 1.489$, 95% CI = [1.270, 1.747], and young students, $OR_{Age} = 0.550$, 95% CI = [0.472, 0.641].

When all variables were included in the model, unique explanatory variance was contributed by, in descending order, school achievement, openness, gender, age, parental education, agreeableness, and general cognitive ability. The association between academic achievement and the giftedness judgment was not surprising because teachers knew the results of the achievement test for all students but had not formally measured the scores for the other variables in the analysis. Interestingly, if two students in a class had the same abilities and motivational characteristics, the one scoring lower on agreeableness was more likely to be considered gifted. The findings for gender and parental education were the most surprising. Boys had 1.5 times higher odds of being considered gifted than girls when they showed equivalent characteristics. A similar finding was observed for parental education. The higher the parents' educational level, the higher the probability that students would be considered gifted regardless of the students' school achievement, motivation, or personality.

Discussion

In this study, we investigated which students were considered gifted from their teacher's perspective. The literature on teachers' representations of giftedness and gifted people has provided evidence that teachers can hold both positive and negative beliefs about gifted students, and, on average, a negative stereotype seems to be more common. The literature on teacher nominations has shown that students who are superior in cognitive as well as noncognitive domains are identified as gifted and selected for special programs. However, these selections seem to be biased because they depend on a student's gender and family background. Using

a representative Dutch data set, standardized measures, and logistic regression analyses with cluster-robust standard errors, we analyzed which student characteristics were relevant for teachers' decisions to label students gifted when no reference was made to a special program.

On the basis of the literature (e.g., Baudson & Preckel, 2013, 2016; Hany, 1993; Lee, 1999; Matheis et al., 2017; Persson, 1998; Preckel et al., 2015), we expected to find positive relationships between students' skills in cognitive domains and their teacher's judgments. In line with this expectation, in all models, academic achievement and general cognitive ability were relevant for a teacher's decision to characterize a student as gifted, so this finding held in both single-predictor models and joint models that took all variables into account. In the final model (where all variables were simultaneously considered), academic achievement was the most important predictor of the giftedness judgment. Students were six times more likely to be considered gifted when their achievement score increased about one standard deviation (when all other variables were controlled for). These findings are in line with the literature on teachers' beliefs about giftedness as well as the nomination literature because both highlight the importance of high general cognitive ability and school achievement for gifted students. The strong association between the giftedness judgment and academic achievement might be a consequence of the accessibility of the school achievement test for the teachers.

For noncognitive factors, we expected a positive association between giftedness judgments and learning-related variables (i.e., academic self-concept, conscientiousness, and openness). Previous research has emphasized the importance of these factors (e.g., Berman et al., 2012; Bishofberger, 2012; Endepohls-Ulpe & Ruf, 2005; Hany, 1997; Moon & Brighton, 2008). However, only openness remained important for teachers (above and beyond cognitive abilities and all other variables) when judging whether or not a student was gifted. Academic self-concept was important only in the first model (when school achievement was not controlled for), and conscientiousness was not significant in any of the calculated models. It might be possible that the self-evaluation of performances in school-related tasks did not explain any variation in the giftedness judgment over and above the composite score of actual school achievement, which represented several subjects. The absent association with conscientiousness might be explained by the items that are very general and have no association with school.

For agreeableness, extraversion, and neuroticism, we expected that the giftedness judgment would be negatively associated with agreeableness and extraversion and positively associated with neuroticism (Baudson & Preckel, 2013, 2016; Matheis et al., 2017). However, we only found a significant association between the giftedness judgment and agreeableness. Students who were less agreeable were more likely to be characterized as gifted by teachers (when all other variables were controlled for).

These findings indicate that teachers recognize cognitive skills as the most important characteristics of giftedness. Furthermore, openness to experience is relevant, and due to the content of the indicators of openness (i.e., the items), it is possible to infer that giftedness is related to openness for ideas as well as curiosity or need for cognition (i.e., typical investment traits; see, for example, Meier et al., 2014; Tibken et al., 2022), and divergent thinking as one aspect of creativity (see Kim, 2006). And although academic self-concept was not significant in the full model, it showed a significant association with the giftedness judgment when school achievement was not controlled for, indicating also the role of motivation. These findings are in line with contemporary theoretical conceptions of giftedness and empirical research using standardized identification measures (Gagné, 2013; Heller, 2005; Renzulli, 1978; Subotnik et al., 2011). Using these student characteristics does not reflect implicit biases in giftedness representations. It seems that teachers do a good job in identifying students with a great deal of potential to have exceptional accomplishments later in life (Park et al., 2007; Preckel et al., 2020; Terman, 1925, 1954; Wai et al., 2005, 2010). Our finding with respect to age even supports the assumption that giftedness is associated with precocity (see Lubinski, 2016). However, the negative association between the giftedness judgment and agreeableness might reflect the negative belief that, on average, gifted students are less socially interested and are somehow emotionally impaired (Baudson & Preckel, 2013, 2016; Endepohls-Ulpe & Ruf, 2005; Matheis et al., 2017). The results indicate that teachers do understand the science underlying the identification of gifted students, but they also hold stereotypes that are not upheld by research.

Highly problematic are the findings that teachers favor boys over girls and students from families with higher parental education when there are no differences in cognitive skills, motivational variables, or personality. These findings are in line with teacher nominations for special education programs (McBee, 2010; Petersen, 2013; Rothenbusch et al., 2016). Thus, girls and students from families with a low educational level are systematically disadvantaged in getting the most appropriate educational opportunities on the basis of their cognitive skills and motivation. Teachers need to be sensitized to these biases so that teachers can be the gatekeepers these students need to reach their potential.

Limitations and Strengths

There were some limitations related to the data. First, we cannot exclude the possibility that some teachers completed the assessment multiple times across cohorts because there was no teacher identifier variable in the data. If teachers completed the assessment several times, our findings would underestimate between-teacher variation. Second, we used unconventional psychological measures for the noncognitive variables. These measures were the result of a compromise

between researchers and educational practitioners, although they were based on existing validated scales. As a consequence, the internal consistency reliability estimates were low for some of the personality attributes. To address this issue, we used the general latent variable modeling framework as implemented in Mplus 8 (Muthén & Muthén, 1998–2017) and combined measurement models for the noncognitive variables—thus defining them as latent variables—with a logistic regression model for the prediction of teachers' judgments. This enabled us to explicitly model measurement errors for the noncognitive variables (Bollen, 1989). Thus, the estimated regression coefficients in the predictions of teachers' judgments were unbiased in terms of measurement error. Using lengthy questionnaires for each noncognitive factor is impossible with students of this age in a classroom setting, and it is necessary to find compromises to bridge the research–practice gap (Penuel & Gallagher, 2017). Developing surveys in collaborations between researchers and educational practitioners could be an effective way to monitor educational outcomes by targeting specific problems in educational practice and enhancing the use of research in educational practice (Borghans et al., 2016). The items took the form of clear statements about behaviors associated with personality traits or academic self-concept. From our point of view, this limitation does not threaten the validity of our findings, whereas it encourages further work on teachers' judgments of giftedness. We analyzed data from a representative multicohort study, which is rarely possible and a great opportunity.

Third, the analysis approach we used to model teachers' judgments can potentially be criticized (Brehmer, 1994; Dhami & Mumpower, 2018). We decided to use a linear model due to the complexity of the models, the imbalanced number of students who were gifted versus not gifted, and the research question we focused on. To the best of our knowledge, this is the first study to investigate teachers' judgments of which students they considered gifted with no immediate consequences for the students. Previous studies used different research designs, sample sizes, measures, and tasks. Whereas some studies examined teachers' beliefs and nomination behavior with respect to personally familiar students (or teachers had to think about personally familiar students), other studies used unfamiliar student vignettes or profiles. Thus, the comparability of our findings with those of previous studies is limited. However, our study serves as a good example of how to investigate teachers' judgments of students' characteristics.

Teachers are very important for gifted students' experiences in school because teachers are often the ones to detect these students' special educational needs in the first place. Teachers are able to assess whether the school curriculum is sufficiently challenging (see Stanley, 2000). Thus, it is very important to understand which student characteristics matter to teachers when judging whether or not a child is gifted. This is the first study to investigate teachers' judgments about giftedness with this degree of detail, providing reliable answers to the question of which student characteristics matter for teachers' decisions about giftedness. To address our research question, we used a representative sample of in-service teachers and students in the Netherlands to investigate teachers' judgments. Furthermore, several student characteristics were measured with standardized achievement tests or questionnaires. Our results indicate that teacher training programs on the identification of gifted students need "to go beyond discussions of the characteristics of gifted individuals and should include components on observation techniques, group decision-making, and in-process evaluation" (Hunsaker, 1994, p. 14), national or international comparative assessments, and reflection phases related to demographic characteristics.

Conclusion and Outlook

Students who were considered gifted showed a higher level of general cognitive ability, showed higher school achievement, were more open, and were less agreeable than the students who were not considered gifted. Furthermore, boys and students from families with a high educational background had a higher probability of being considered gifted. These findings underlie the problematic situation of teacher judgments and nominations because they cause disadvantages for certain groups of students independent of their abilities, motivation, or personality. Informing teachers about these results must be the first step toward encouraging them to scrutinize their conceptualizations of giftedness and their selection behavior. Teacher trainings to identify gifted students should encompass data on cognitive abilities, techniques to identify students' motivation, and critical discussions about overcoming gender and family background biases.

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The data analyzed in this study are available upon request to the first author for purposes of reproducing the results. The R and

Mplus code used to generate the findings reported in the article are available upon request from the first author for purposes of reproducing the results or replicating the study. The newly created, unique materials used to conduct the research (i.e., the questionnaires) are available upon request from the first author for purposes of reproducing the results or replicating the procedure.

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Supplemental Material

Supplemental material for this article is available online.

Notes

1. Different methodological approaches have been used to shed light on these beliefs. These approaches include qualitative designs in which teachers were asked to define giftedness or describe gifted students they know (e.g., Dahme & Eggers, 1988; Hunsaker, 1994), quantitative designs in which teachers were asked to rate the importance of several characteristics for identifying gifted students (e.g., Hany, 1993), and experimental designs that used vignettes about fictitious students, including whether they were labeled gifted or not. After reading these vignettes, teachers were then asked to infer other attributes, such as personality or social competence, on the basis of the giftedness label (e.g., Baudson & Preckel, 2013, 2016).
2. For more information, see http://educatieveagendalimburg.nl/onderwijsmonitor-p/english
3. Students' IDs were presented in rows, and the behavioral aspects that the teacher should assess were presented in columns.
4. The test has been compulsory since 2015.
5. These items do not reflect items that are typically used to assess academic self-concept. They are a compromise between researchers and practitioners. The self-reports relate to a relatively broad and important range of academic tasks indicating students' representations of their success in these activities. For instance, giving a speech is part of the educational process and is an academic skill that is already relevant at the beginning of formal schooling. Furthermore, the skills that were considered were deemed important by teachers for school performance (e.g., following the news is part of study skills according to the teachers).
6. Correlations between age and general cognitive ability or achievement were relatively high. Neither measure was normed to control for age differences. The observed correlations were probably driven by two aspects. First, some children remain in kindergarten longer than others, and Dutch studies have shown that these children have lower CITO test scores (e.g., Roeleveld & van der Veen, 2007). Second, some children are held back later in primary school, and, on average, retention rates in Dutch primary school are relatively higher than other countries (European Commission & Eurydice, 2012). In addition, negative relationships have been observed between grade retention and both ability and achievement test scores (e.g., Reezigt et al., 2013).
7. The option to use auxiliary variables in Mplus has been used to identify a set of variables that will be used as missing data correlates in addition to the analysis variables. For example, the auxiliary variables in the model in which we analyzed the relationship between age and the giftedness judgment were gender, parental education, general cognitive ability, academic achievement, personality traits, and academic self-concept. In doing so, the number of cases we considered was the same in all analyses.

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