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A comparison of high-ability pupils' views vs. regular ability pupils' views of characteristics of good primary school teachers

Anouke Bakx^a , Ton Van Houtert^a, Maartje van de Brand^b and Lisette Hornstra^c

^aFontys Institute for Child and Education, Fontys University, Tilburg, The Netherlands; ^bPlein013 and Onderwijszorgteam, Fontys University, Tilburg, The Netherlands; ^cDepartment of Education, Utrecht University, Utrecht, The Netherlands

ABSTRACT

High-ability pupils in primary schools often do not achieve up to their full potential and teachers seem to face difficulties to motivate these pupils. In this study 891 primary school pupils (463 high-ability pupils) were asked about their views on desired characteristics of good teachers by means of an open teacher-spider-questionnaire. The characteristics reported, were analysed using the three “basic needs” from the Self-Determination Theory. The answers of high-ability pupils were compared to answers of pupils from regular primary education. For both groups, teaching characteristics fostering relatedness, followed by competence, were mentioned most. It was autonomy which was mentioned less frequently by both groups. The answers of the two groups of pupils mostly corresponded, although some differences emerged in specific subcategories. High-ability pupils more frequently mentioned characteristics attuning to their needs (understanding) and encouragement (challenge), and mentioned “providing choice” less often. There were also some differences found between characteristics mentioned by (high-ability) boys and girls.

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Introduction

Many high-ability pupils are not optimally motivated and achieve significantly below their potential (Driessen, Mooij, and Doesborgh 2007), especially in the Netherlands (PISA 2012). Studies on underachievement among high-ability pupils report outcomes varying from 15% up to even 50% of high-ability pupils underachieving (Morisano and Shore 2010). These outcomes suggest a necessity of gaining more insights into how teachers can adapt better to the educational needs of high-ability pupils. The self-determination Theory (SDT) suggests that “need-supportive teaching” fosters pupils’ motivation (Stroet, Opdenakker, and Minnaert 2013). SDT posits that all pupils have three basic psychological needs; (1) relatedness, (2) autonomy and (3) competence, which need to be fostered in order for pupils to be motivated (Ryan and Deci 2001). The aforementioned high rates of lacking motivation and underachievement among high-ability pupils (e.g. Driessen, Mooij, and Doesborgh 2007) suggest

that not all teachers are yet capable of providing need-supportive teaching for these pupils. Teaching high-ability pupils in need-supportive ways may require specific and complex teacher characteristics or strategies. Yet, previous research on characteristics of good teachers for high-ability students have focused mostly on cognitive characteristics of teachers rather than on how teachers adapt to the pupils' motivational needs (Mills 2003). Primary school pupils themselves are not often actively involved in these studies, let alone high-ability pupils. The goal of our study was threefold. First, by using an open methodology, our study aims to contribute to a better understanding of how high-ability pupils perceive their teachers can best support their basic psychological needs in order to offer them an optimally motivating learning climate. Secondly, we aimed at gaining more insight into how these views compare to average-ability pupils' views on need-supportive teaching. These insights can contribute to our understanding of how teachers can create a more motivating learning environment that encourages high-ability pupils to fulfil their full potential.

Theoretical background

Defining high-ability primary school pupils

In literature, there is no consensus yet on defining giftedness or "high ability pupils". Different criteria are used for identifying gifted or high-ability pupils. IQ scores are used, and sometimes additional criteria, such as outstanding performance scores, high levels of motivation, creativity or inventiveness (Doolaard & Oudbier, 2010; Pfeiffer 2012). A shared selection of characteristics is the focus on cognitively talented pupils. Traditionally, giftedness was defined narrowly: often as the highest scoring students (2.5% of all students), but recent definitions tend to take on a broader view (see Subotnik, Olszewski-Kubilius, and Worrell 2011). This broader focus on a larger group of cognitively talented students is also represented in the definition recently put forward by the American National Association for Gifted Children:

those who demonstrate outstanding levels of aptitude (defined as an exceptional ability to reason and learn) or competence. (NAGC 2011, 1)

In this study, we also focus on this broader group of high-ability pupils.

Good teaching in general and more specifically for high-ability students

Teachers play a significant role in the quality of education. Good teachers contribute positively towards pupils' educational outcomes (McKinsey 2007) as well as to pupils' well-being in school (Noble and McGrath 2014). Bakx et al. (2015) described teacher's quality from different perspectives. The three perspectives used most frequently in literature are: (1) effectiveness research (e.g. den Brok, Brekelmans, and Wubbels 2004; Kyriakides, Creemers, and Antoniou 2009); (2) perception studies, including learning environment research (Allen and Fraser 2007); and (3) research on teachers' professional knowledge (Verloop 2005). Looking at teacher quality from these perspectives, shows that good teachers have a lot of specific characteristics varying from personality related characteristics like humour (Hamachek 1969), trustworthiness (Kutnick and Vena 1993) and a nice personality (Beishuizen et al. 2001) to instruction related skills like transferring knowledge and skills effectively, good instruction and classroom management strategies (Brophy and Good 1986). Table 1 presents the

Table 1. Characteristics of good teachers.

From the perspective of	Characteristics of good teachers
Effectiveness research	<ul style="list-style-type: none">• clear explanation of lessons and assignments (Hamachek 1969)• teaching skills (Scheerens 2016)• interaction skills (den Brok, Brekelmans, and Wubbels 2004)• having explicit goals (Brophy 2000)• organising lesson content (Brophy 2000)• offering sufficient training opportunities (Weinert, Schrader, and Helmke 1989)• controlling students' learning progress (Weinert, Schrader, and Helmke 1989)• instruction (Brophy and Good 1986)• classroom management techniques (Brophy and Good 1986)• realise an appropriate level of difficulty for the instruction (Marzano 2003)• continuous progress at a high success rate (Marzano 2003)
Perception studies, including learning environment research	<ul style="list-style-type: none">• transfer knowledge and skills (Beishuizen et al. 2001)• a nice personality (Beishuizen et al. 2001)• physical presentation (Kutnick and Vena 1993)• humour (Hamachek 1969)• care for pupils (Kutnick and Vena 1993)• trustworthiness (Kutnick and Vena 1993)• communicative competence (Scheerens 2007)• being helpful in schoolwork (Hamachek 1969)• effective diagnosis of learning needs (Ryan and Deci 2001)
Research on teachers' professional knowledge	<ul style="list-style-type: none">• teachers' knowledge (Darling-Hammond 1999; Clausen, Reusser, and Klieme 2003)• subject matter knowledge (Hill, Rowan, and Ball 2005; Gencturk 2012)• pedagogical content knowledge (Elbaz 1991; Shulman 1986, 1987)• have sufficient knowledge in order to structure learning materials in a right way (Brophy and Good 1986)

qualities of good teachers as described by Bakx et al. (2015) from the three different perspectives.

Ideally, good teachers have the knowledge, skills, tools and “personality” as described in Table 1. However, maybe a teacher who has all these qualities may not be the best teacher for high-ability pupils. Some teachers are better able to teach high-ability pupils than other teachers (Mills 2003). Explicit knowledge is needed for teachers in order to teach high-ability pupils in a suitable way, for example, knowledge on the educational needs of high-ability pupils (Davis, Rimm, and Siegle 2014) and how the gifted brain works (Sousa 2009). Also knowledge of and interest in the development of affective knowledge and skills of these pupils is important for being able to offer suitable education for high-ability pupils (Jen 2017). Specific preferred teacher characteristics already found in earlier studies on teaching high-ability students concern e.g. enthusiasm (Sisk 1989), flexibility (Renzulli 2005) and intelligence (Milgram 1979). In her study, Mills (2003) investigated 63 high-ability teachers’ and 1.247 high-ability students’ backgrounds and personality styles. She concluded that effective teachers for high-ability students seem to be real experts in their field and possess characteristics such as a preference for abstract themes and concepts, openness, intuition, flexibility and valuing logical analysis and objectivity. Mills claims that it is assumable that high-ability

students might be motivated and learn the best when their cognitive and personality styles are matched with teachers who have these same styles.

Callahan et al. (2015) studied effective curricular and instructional models for gifted pupils. Their conclusion was that for these pupils, curricula and instructional strategies are needed that challenge and enhance their learning outcomes. More specifically, they found that high-ability pupils can learn best in the context of a rich curriculum, in which responsive instruction is a central part. Teachers should be able to differentiate in their instruction and they should be able to create complex learning assignments, requiring pupils' deep thinking strategies (Kaplan 1986). Summarised, in order to motivate, stimulate and challenge high-ability pupils, next to the characteristics of good teachers (presented in Table 1) additional qualities are needed as *specific knowledge* on characteristics of high-ability pupils, their educational needs and how they learn, *specific skills*, like differentiation strategies, ability to provide responsive instruction, be an expert in the field, intelligent, be able to work with abstract themes and concepts, being able to design rich learning activities and create complex learning assignments and challenge pupils' deep thinking strategies. Next, the following teachers' *attitude- or personality-related qualities* can be helpful in providing suitable education for high-ability pupils: enthusiasm, flexibility, openness, intuition, valuing logical analysis and objectivity. Finally, understanding of these pupils "as a whole" with their intellectual, affective/emotional and social needs, can help teachers offer suitable education for high-ability pupils (Jen 2017).

Self-determination theory

An overarching framework to "good teaching" that encapsulates the aforementioned characteristics is Self-Determination Theory (SDT; Ryan and Deci 2001), which has defined a number of universal characteristics of good teaching which are assumed to benefit all pupils regardless of their backgrounds or cognitive abilities. SDT proposes that pupils are motivated to learn when three basic psychological needs are fulfilled, the needs for (1) autonomy, (2) relatedness and (3) competence (Stroet, Opdenakker, and Minnaert 2013). Offering so-called need-supportive teaching fulfils these needs, leading towards more motivation, higher achievements and well-being (Ryan and Deci 2001). The intrinsic motivation, stimulated by need-supportive teaching, is to be preferred over other more controlled types of motivation, because intrinsic motivation is more likely to maintain (Richmond 1990). In their review, Stroet, Opdenakker, and Minnaert (2013) found that need-supportive teaching promoted intrinsic motivation.

SDT posits that all learners are motivated to learn (Ryan and Deci 2001). However, when pupils' basic needs are not met, the connection between the pupils (needs) and the educational programme disappears and may cause amotivation. As such, the findings that low motivation and underachievement are more prevalent among high-ability pupils, suggests that high-ability pupils' basic needs are often not optimally fostered. Hence, high-ability pupils may require different teacher strategies in order for their basic needs to be met (see also Preckel et al. 2008).

Many studies found positive relations between need-supportive teaching and pupils' motivation, especially when teachers were capable of integrating support of all three basic needs while teaching (Stroet, Opdenakker, and Minnaert 2013). Most studies on need-supportive teaching concern measurements by means of pupils' views. Stroet, Opdenakker, and

Minnaert's (2015) findings suggest that especially *perceived* need-support enhances pupils' motivation. Summarised, especially pupils' own experience of need-support seems to matter. In the next section the three basic needs and teacher strategies supporting these needs are described in more detail.

Autonomy

Autonomy concerns pupils' inherent desire to be causal agents and to experience volition (Stroet, Opdenakker, and Minnaert 2013). For pupils in primary schools, meeting the need for autonomy means that they are able to act in accordance with their sense of self and can undertake activities volitionally. Stroet, Opdenakker, and Minnaert (2013) revealed three specific aspects useful for meeting pupils' need for autonomy: (1) offering choice (in learning activities, contents, choosing one's own direction), (2) fostering relevance (explain why pupils are expected to engage in certain learning activities and contents), and (3) show respect for pupils and their opinions, also when they are resistant in undertaking certain activities. Meeting pupils' need for autonomy enhances motivation, well-being, and achievement outcomes, while a controlling teaching style yields negative effects (e.g. Stroet, Opdenakker, and Minnaert 2013).

According to SDT, all pupils have the innate need for autonomy and benefit from autonomy-supportive teaching. Previous research (Hornstra et al. 2015) suggested that many teachers find it hard to teach certain groups of pupils in autonomy-supportive ways, especially pupils with an at-risk background, with lower performance levels, or low motivation, which leads to teacher resorting to more controlling ways of teaching. As high-ability students can also have specific educational needs and interests that may differ from those of the general student population, teachers may also find it difficult to teach high-ability students in autonomy-supportive ways. Also, high ability students may require different strategies in order for their needs to be met. For example, offering relevant choices to high-ability student may involve different choices than choices which are offered to average-ability students.

A few studies examined autonomy-support among high-ability students. Miserandino (1996) found that high-ability pupils who perceived a lack of autonomy showed more withdrawal behaviour than pupils who perceived themselves as being (more) autonomous. Furthermore, Garn and Jolly (2013) found that providing choice and offering learning experiences connected to pupils' interests helped to increase high-ability pupils' intrinsic motivation. Both studies seem to be in line with more general findings on autonomy and autonomy-supporting teaching (Stroet, Opdenakker, and Minnaert 2013). However, as both studies only included high-ability pupils, it is not clear whether teaching strategies that support high-ability pupils' need for autonomy are different from strategies that are effective with other pupils. It is interesting to note that, even though the role of autonomy and autonomy-supportive teaching have only been scarcely examined among high-ability pupils, many scholars have suggested that especially high-ability pupils would benefit from autonomy-supportive teaching (Betts 1985).

Relatedness

The need for relatedness is the second psychological need, referring to the relation between pupils' and their teachers and between the pupils' as a group (Ryan and Deci 2001). Teachers are key figures in children's lives, and function as important attachment people for pupils (Pianta, Hamre, and Stuhlman 2003). A good relation between teachers and pupils and between pupils as a group contributes towards a positive learning environment, in which pupils dare to involve in all kinds of learning activities (Seligman 2007). Social support by teachers contributes towards pupils' needs for relatedness and for belonging (Ryan and Deci 2006). Substantial positive effects of teacher's social support were found on pupils' emotions, motivational beliefs, and in turn on their study outcomes (Ahmed et al. 2010; Roorda et al. 2011).

Stroet et al.'s review study (2013) revealed four specific aspects, useful for meeting pupils' need for relatedness. In general, teachers who show high levels of involvement with students, by using dialogic interaction and showing engagement and support are more able to meet pupils' needs for relatedness. More specifically, this could be done by (1) realising proximity (co-operate with pupils), (2) showing affection and avoid negative interactions, such as yelling, (3) acting upon dependability (supporting pupils with what they depend on their teacher for, like sources), and (4) make pupils feel they belong there.

In line with the more general findings, Garn and Jolly (2013) found relatedness was also of high importance to high-ability pupils. However, how teachers can meet the need for relatedness in this group of pupils, has only scarcely been examined up till now.

Competence

Pupils' need for competence is the third need described in the SDT. Competence refers to the feeling that one is able to do what is asked and capable of attaining the goals set. Especially in the context of education, the need of competence also refers to some continual stretching of one's competencies (Stroet, Opdenakker, and Minnaert 2013). In order to meet the need for competence, teachers can offer structure in their educational activities. Structure helps acquiring or keeping control over the learning process and as such, enhances pupils' feelings of competence. Four ways of providing structure (Stroet, Opdenakker, and Minnaert 2013) are (1) offering clarity (for example in rules), (2) providing guidance (help with academics), (3) encouraging pupils (expressing high expectations, providing challenge), and (4) providing positive feedback.

It might seem that high-ability pupils have rather strong feelings of competence because of their intellectual capabilities, however, competence feelings of high-ability pupils can vary across domains. Many high-ability pupils, because of their valued intelligence, are also worried about their competence because of the continuous pressure of "showing to be smart" (Dweck 2013). For high-ability students, a lack of competence can also lead to negative motivation outcomes (Miserandino 1996). Providing structure appears to be the most promising strategy for meeting high-ability pupils' need of feeling competent (Bakx et al. 2016; Stroet, Opdenakker, and Minnaert 2013). Especially encouraging pupils by expressing high expectations and offering challenge has been studied extensively as an effective strategy for high-ability pupils (for a review, see Bailey et al. 2012). If high-ability pupils are adequately challenged to perform at a level matching their cognitive abilities, also providing clarity,

guidance, and feedback seem to be equally important strategies for high-ability pupils as for other pupils.

Gender differences

In our study we were also interested in the question whether gender might play a part in views of (high-ability) pupils of need-supportive teaching. Smutny (2003) described a number of differences between high-ability girls and high-ability boys. High-ability girls, for example, are less often recognised as having higher abilities, they are more likely to have lower self-esteem, feel less comfortable with “standing out”, and face issues of perfectionism more often. The work of Preckel and colleagues (2008) showed that there also are gender-related differences among high-ability pupils in achievement, self-concept, interest, and motivation in mathematics. These gender-differences were much more prevalent among high-ability pupils compared to average-ability students, suggesting that high-ability boys and girls may also differ in the kind of teaching strategies optimally fostering their needs, and as such their preferred teacher characteristics.

Research questions

The main research question addressed in this study was: Which are characteristics of good teachers in primary education according to high-ability pupils in comparison to other pupils? Three more specific research questions were answered:

- (1) Which characteristics of need-supportive teaching (i.e. autonomy-support, involvement and structure), are reported by high-ability and regular ability pupils?
- (2) How do responses of high-ability and regular ability pupils differ with regard to need-supportive teaching?
- (3) What gender differences regarding need-supportive teaching can be found in the responses within the groups of high-ability pupils and regular pupils?

Method

Participants

In total 891 pupils in grade 4 to 6 participated in this study (513 boys and 375 girls; 3 unknown). The pupils attended either regular schools (428 pupils) or special high-ability programmes (463 pupils). The high-ability pupils were selected by their (former) regular schools for participation in educational programmes for high-ability pupils. Their ages varied between nine and twelve years old. Table 2 presents an overview of their characteristics.

Table 2. Participants in this study.

Type of educational programme	Boys	Girls	Unknown	Total
Regular primary schools	216 (50.5%)	212 (49.5%)	0	428
Special ability programmes	297 (64.6%)	163 (35.4%)	3	463
Total				891

Instruments

An open-ended questionnaire called “the *teacher-spider*” was used (Bakx et al. 2015). This questionnaire contains one open question: “What is a good teacher for pupils like yourselves?”, as pictured in Figure 1. In the middle of the *teacher-spider* is an open space for a drawing.

The *teacher-spider* challenges respondents to come up with their own input, without being influenced by pre-structured items as is customary in closed-ended questionnaires.

Procedure

School principals and teachers in schools/programmes for high-ability pupils were invited to participate in the study. Participation in the study was voluntarily. School principals and teachers gave their consent for anonymous participation of their pupils in this study and asked the pupils’ parents for their consent for their child to participate in the study. The research-assistants who collected the data used the same, standardised instruction, explaining that the goal of the study was to improve education for high-ability pupils, using input of the pupils themselves.

Data-analysis

In total the pupils reported 4.270 preferable teacher characteristics. The pupils from regular schools filled in 5.46 characteristics average, while the high-ability pupils only filled in 4.17 teacher characteristics average. First, all these 4.270 characteristics were entered into Excel-data-sheets. All answers were literally typed from the questionnaires into the data files. Next, two independent researchers replaced synonyms, for example “friendly”, “gentle”, “kind”;

What is a good teacher?

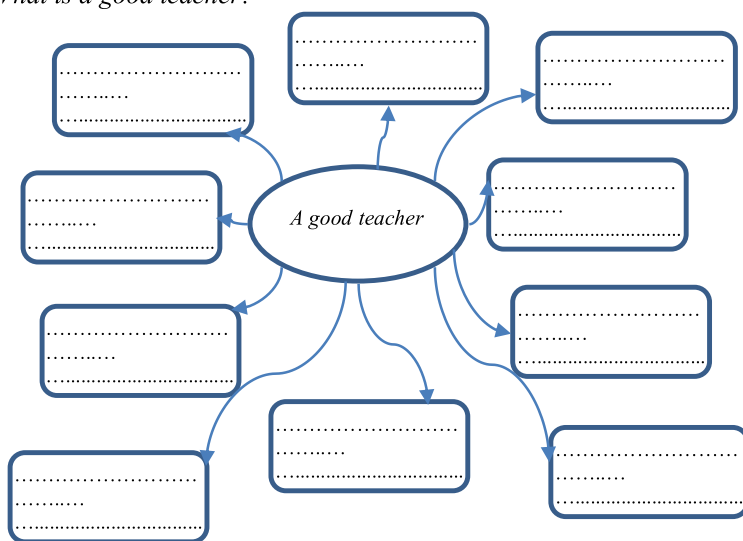


Figure 1. Pupil’s questionnaire “*teacher-spider*” on teacher characteristics (Bakx et al. 2015, 550).

“nice”; these were transformed into “kind”. This way of data reduction prevents under- and overestimation of the importance of certain characteristics (Weber 1990).

We analysed the data in three steps. In the first step, content analysis was conducted in order to categorise the data into the three main content categories (1) autonomy; (2) relatedness and (3) competence. In order to do so we used the coding scheme of Stroet, Opdenakker, and Minnaert (2015). For each of the three main categories, pupils’ answers that could be considered to reflect pupils’ needs (for example “relatedness”) were added to the original coding scheme. Furthermore, we wanted to specify the pupils’ answers into more specific subcategories which consisted of aspects of need-supportive teaching (presented in the middle and right column from Table 3). Not all data could be categorised using the coding scheme as it was, for answers, for example, like “doing nice or fun things” or “a female teacher”. Some new subcategories emerged, going back and forth between the data and the coding scheme. This step in our analysis was an iterative process, connecting the characteristics reported by the pupils to the main and sub categories or to additional subcategories (for this procedure, also see Bowen 2006). This resulted in the coding scheme as presented in Table 3, in which the pupils’ needs were further specified (second column) and in turn, led to more specific teacher characteristics in the third column.

In the third step of analyses, four researchers discussed the coding scheme in relation to the theoretical framework and the data available. We concluded that this seemed a usable framework to analyse the data. Following, two researchers coded 20% of data using this new coding scheme. They did this independently of one another and compared and discussed their findings together. After this, all data were coded by the two researchers together using this coding scheme. To see if there were any differences between responses of high-ability and regular ability pupils, and between high and regular ability boys’ and girls’ responses, chi-square tests were used, with a set level of significance of 5%.

Results

Characteristics of good teachers, related to the three basic needs

Table 4 presents the answers given by the two groups of pupils related to the three main needs of pupils. Both regular and high-ability students referred to relatedness most often, followed by competence, and autonomy. The frequencies of these answers did not significantly differ between the two groups ($\chi^2 = 4.010$, $p = 0.260$), suggesting that relative importance of fulfilment of each of these three basic needs does not differ between the two groups.

Relatedness

Answers referring to relatedness were reported most frequently by both groups. In total more than one third of all answers given by the pupils had to do with pupils’ need for “relatedness”. The high-ability pupils referred to relatedness in 43.2% of their answers as well as 40.3% of the regular-ability pupils, not being statistically significant ($\chi^2 = 3.604$, $p = 0.058$). The subcategories were also compared. Table 5 presents an overview of the specific subcategories of answers reported by the pupils. Attuning to pupils (for example “a teacher who understands me”) was mentioned more frequently by high-ability pupils ($\chi^2 = 16.196$, $p < 0.001$).

Table 3. Coding scheme (based on Stroet, Opdenakker, and Minnaert 2015).

Pupils' needs	Specific pupils' needs	What a teacher can do
<i>Autonomy</i>		
Choice	<ul style="list-style-type: none"> • Having a choice • Experiencing room for own initiatives • Opportunities for decision-making 	<ul style="list-style-type: none"> • Offer pupils choices (e.g. kind of task, content, groups) • Support and approve pupils' own initiatives • Support and approve pupils' own decisions • Help to choose one's own direction
Fostering relevance	<ul style="list-style-type: none"> • Seeing and acknowledging the goal of the learning tasks • Being convinced of the relevance of tasks • Variety in tasks 	<ul style="list-style-type: none"> • Explain the goals to the pupils and involve pupils in goal setting • Foster relevance of tasks • Offer different kinds of tasks • Plan "open space", to be filled in by pupils themselves
Respect	<ul style="list-style-type: none"> • Feeling respected • Feeling their own values are approved • Experiencing space for talking about criticism or negative feedback • Feeling free of pressure 	<ul style="list-style-type: none"> • Show respect to pupils • Be open to and listen to aspects which are important for pupils • Listen to negative feedback of pupils • Take time to listen to pupils • Involve pupils in improvement of education (all aspects) • Prevent pressure or stress for the pupils
<i>Relatedness</i>		
Positive learning environment/tuning	<ul style="list-style-type: none"> • Feeling safe and happy in school • Feeling that the teacher is there for the pupil 	<ul style="list-style-type: none"> • Create a positive learning environment • Showing that the teacher is available to the pupils
Proximity and affection	<ul style="list-style-type: none"> • Attention and time of the teacher • Feeling that there is a good connection with the teacher • Feeling of trust towards the teachers • Having a teacher I can go to and talk to at any moment • Feeling liked by the teacher 	<ul style="list-style-type: none"> • Invest time and attention in the pupils • Invest in building a relation with the pupils • Show empathy and pro-social behaviour • Be kind and friendly • Treat specific information confidentially • Show affection and positive attention to pupils • No negative interaction like yelling or neglect
Dependability	<ul style="list-style-type: none"> • Feeling that the teacher can help them when support is needed 	<ul style="list-style-type: none"> • Support pupils with the matters on which they depend on to be offered for by their teachers (like sources)
Belongingness	<ul style="list-style-type: none"> • Feeling that they belong there • Feeling that they matter • Feeling that all pupils are equal(ly) important 	<ul style="list-style-type: none"> • Make pupils feel they belong there • Make pupils feel they are important • Treating all pupils alike; fairly and equally important
<i>Competence</i>		
Clarity	<ul style="list-style-type: none"> • Having rules and routines, which are followed 	<ul style="list-style-type: none"> • Be consistent/ always behaving or happening in a similar way
Guidance	<ul style="list-style-type: none"> • Getting help with task management • Receiving clear explanation • Knowing what is expected and allowed in class • Feeling that one can consult the teacher when input is needed 	<ul style="list-style-type: none"> • Being available for answers to questions on task management • Giving clear instruction • Being clear in what is expected (behaviour) and setting boundaries • Being available to answer questions on content and knowing where one should consult an expert/media/sources

(Continued)

Table 3. (Continued)

Pupils' needs	Specific pupils' needs	What a teacher can do
Encouragement	<ul style="list-style-type: none"> Feeling that one can use his own qualities Being able to show what one can Not being afraid of failure/ mistakes Being challenged to learn and explore learning possibilities 	<ul style="list-style-type: none"> Create non-competitive learning structures and offer space to use one's qualities fully Create space and invite pupils to show what they are capable of Use mistakes as learning possibilities Express high expectations and encourage the pupils to excel Offer challenging tasks
Feedback	<ul style="list-style-type: none"> Being evaluated on your own, appropriate level Help when needed on strategy or process Getting insight into own cooperation and social skills Receiving learning opportunities from feedback Having control on gaining valued outcomes Being triggered to think for oneself/reflect Receive process-related feedback on learning activities 	<ul style="list-style-type: none"> Give feedback and reflection to the pupil in relation to his level and qualities Providing suitable step-by-step directions when needed Providing evaluative feedback on cooperation and social skills Evaluate and give feedback in relation to the goals set Non-comparative feedback focused on helping students gain control on valued outcomes Ask questions instead of giving information Use informative language, explaining what the pupil does well (related to the goal), what can be done better and how a next step can be taken
<i>Other needs</i>		
Fun, relaxation	<ul style="list-style-type: none"> Doing nice and fun things 	<ul style="list-style-type: none"> Offer a variety in activities and reward pupils e.g. with a game

Table 4. Frequencies of basic needs mentioned.

Basic needs	High-ability pupils (n = 463)	Regular-ability pupils (n = 428)
(1) Relatedness	43.2%	40.3%
(2) Competence	39.0%	40.3%
(3) Autonomy	9.5%	10.5%
(4) Other	8.4%	8.9%

Competence

High-ability pupils referred to the need for competence in 39.0% of their answers. Regular-ability pupils referred to the need for competence as often as they referred to relatedness (also 40.3%). This difference between the two groups was not statistically significant ($\chi^2 = 0.409, p = 0.522$). High-ability pupils mentioned encouragement more often than regular-ability pupils did (2.3% vs. 0.9%, respectively; $\chi^2 = 13.424, p < 0.001$).

Autonomy

Characteristics of good teaching related to the need of autonomy were reported less frequently than relatedness and competence in both groups of pupils (9.5% and 10.5% for high- and regular-ability pupils, respectively) and were reported as frequently in both groups ($\chi^2 = 1.189, p = 0.275$). Within the category of autonomy, "offering choice" was more often mentioned as an important aspect of good teaching by regular-ability pupils than by high-ability pupils (5.8% vs. 4.1%, respectively; $\chi^2 = 6.310, p = 0.012$).

Table 5. Frequencies of specific aspects of need-supportive teaching mentioned.

Aspects of need-supportive teaching	Examples of pupils' answers	High-ability pupils (<i>n</i> = 463)	Regular-ability pupils (<i>n</i> = 428)
(1) Relatedness – Affection	<ul style="list-style-type: none">• is kind to me• has a fine sense of humour	30.8%	31.5%
(2) Competence – Guidance	<ul style="list-style-type: none">• gives good instruction• helps me when I do not know how to do it	20.9%	21.9%
(3) Competence – Clarity	<ul style="list-style-type: none">• has fair rules• is clear	15.4%	16.9%
(4) Relatedness – Attunement	<ul style="list-style-type: none">• understands you• listens to you	11.9%	8.2%
(5) Other	<ul style="list-style-type: none">• does fun stuff• creates adventures	8.4%	8.9%
(6) Autonomy – Choice	<ul style="list-style-type: none">• let me choose a workplace• let me organise activities we choose	4.1%	5.8%
(7) Autonomy – Respect	<ul style="list-style-type: none">• does not interrupt me• listens to my opinion	3.0%	2.1%
(8) Autonomy – Fostering relevance	<ul style="list-style-type: none">• tells me why something is important• explains why we do things	2.4%	2.6%
(9) Competence – Encouragement	<ul style="list-style-type: none">• gives me challenging assignments• gives complex tasks	2.3%	0.9%
(10) Competence – Feedback	<ul style="list-style-type: none">• reward me if I work well• explain how I can do it differently when I do something wrong	0.5%	0.6%
(11) Relatedness – Dependability	<ul style="list-style-type: none">• makes time for you	0.5%	0.6%

Other

Only a small percentage of answers (8.4 and 8.9% of all answers by the high-ability and regular-ability pupils, respectively) did not fit into any of the three categories and was coded in category (4) “other”. Answers in the category “other” mostly referred to the teacher offering fun and leisure activities, for example, “working on arts and crafts”, “offer fun PE lessons”. Answers in the category “other” also contained statements about general characteristics of the teacher, for example, “is not too old” or “is athletic”. Perhaps not surprisingly, hardly any answers were mentioned that referred to opposite aspects of need-supportive teaching, i.e. referring to a preference for control, chaos or neglect. Only one student mentioned “does not give us too much freedom”.

Gender differences

Potential gender differences in the answers of high-ability and regular-ability pupils were also examined (see Tables 6 and 7 for the specific subcategories). The outcomes reveal that both boys and girls mentioned relatedness most frequently (41.6% in both groups), followed by competence (39.3 and 40.1%), and autonomy (9.5% and 10.6%). Gender differences in these main categories were not statistically significant ($\chi^2 = 6.145, p = 0.105$). Although each need is mentioned about as often by boys and girls, further inspection revealed that there were some interesting significant gender differences *within* the high-ability group ($\chi^2 = 9.317, p = 0.025$) and *within* the regular-ability group ($\chi^2 = 11.027, p = 0.012$).

Relatedness

High-ability girls mentioned attuning to pupils' needs more frequently than high-ability boys (13.7% vs. 10.4%; $\chi^2 = 4.874, p = 0.028$), especially answers referring to the importance being understood by the teacher, whereas this subcategory was mentioned as frequently by regular-ability boys and girls.

Competence

High-ability boys referred to the need for competence more often than high-ability girls (41.2% vs. 36.1%; $\chi^2 = 5.139, p = 0.024$), whereas the reverse was found for the regular-ability group, in which the need for competence was mentioned more often by girls in the regular-ability group than by boys (42.6% vs. 37.2%; $\chi^2 = 6.847, p = 0.009$). Table 7 revealed that for regular-ability pupils, especially guidance (for example "gives clear instructions") was mentioned significantly more often by regular-ability girls than by regular-ability boys (23.9% vs. 19.2%; $\chi^2 = 7.497, p = 0.006$).

Autonomy

No significant gender differences with regard to the frequency of autonomy were found in the regular-ability group ($\chi^2 = 0.373, p = 0.540$), whereas in the high-ability group, autonomy was mentioned more often by girls than by boys (11.3% vs. 8.1%; $\chi^2 = 5.652, p = 0.011$). This difference was primarily due to the subcategory fostering relevance. High-ability girls referred to this aspect of need-supportive teaching (for example "gives thematic lessons") more often than high-ability boys (2.6% vs. 1.5%; $\chi^2 = 8.538, p = 0.004$).

Table 6. Frequencies of basic needs mentioned by high-ability and regular-ability boys and girls.

Categories of pupils' needs	High-ability		Regular ability		Total group	
	Boys (<i>n</i> = 297)	Girls (<i>n</i> = 163)	Boys (<i>n</i> = 216)	Girls (<i>n</i> = 212)	Boys (<i>n</i> = 513)	Girls (<i>n</i> = 375)
(1) Relatedness	42.0%	44.6%	41.1%	39.7%	41.6%	41.6%
(2) Competence	41.2%	36.1%	37.2%	42.6%	39.3%	40.1%
(3) Autonomy	8.7%	7.9%	10.9%	10.1%	9.5%	10.6%
(4) Other	8.1%	11.3%	10.7%	7.6%	9.6%	7.7%

Table 7. Frequencies of specific aspects of need-supportive teaching mentioned by high-ability and regular-ability boys and girls.

Categories of pupils' needs	High-ability		Regular ability		Total group	
	Boys (n = 297)	Girls (n = 163)	Boys (n = 216)	Girls (n = 212)	Boys (n = 513)	Girls (n = 375)
(1) Relatedness – Affection	31.1%	30.6%	33.3%	30.2%	32.1%	30.4%
(2) Competence – Guidance	22.3%	18.9%	19.2%	23.9%	20.8%	22.0%
(3) Competence – Clarity	16.3%	14.3%	16.6%	17.2%	16.4%	16.1%
(4) Relatedness – Attunement	10.4%	13.7%	10.7%	7.6%	9.6%	7.7%
(5) Other	8.7%	7.9%	7.1%	9.0%	8.8%	10.8%
(6) Autonomy – Choice	3.7%	4.6%	6.5%	5.3%	5.0%	5.0%
(7) Autonomy – Respect	2.4%	2.4%	3.0%	2.3%	2.7%	2.3%
(8) Autonomy – Fostering relevance	2.0%	4.3%	1.5%	2.6%	1.8%	3.3%
(9) Competence – Encouragement	1.9%	2.8%	1.0%	0.8%	1.5%	1.6%
(10) Competence – Feedback	0.7%	0.1%	0.5%	0.7%	0.6%	0.5%
(11) Relatedness – Dependability	0.5%	0.4%	0.7%	0.5%	0.6%	0.4%

Conclusions and discussion

High-ability pupils' and average-ability pupils' views on preferred teacher characteristics

The aim of this study was to gain more insight into preferred teaching strategies by high-ability pupils compared to regular-ability pupils. As such, high-ability and regular-ability pupils completed an open teacher-spider-questionnaire on preferred teacher characteristics. The outcomes of our study align with assumptions from SDT as the vast majority of answers provided by both groups included aspects of need-supportive teaching. In their review, Stroet and her colleagues (2013) showed the benefits of need-supportive teaching, which means that teachers attune their educational activities and their way of teaching towards the three basic needs. In line with these findings, pupils in both groups indicated that good teaching is teaching that supports their need for relatedness, competence, and autonomy. This was found for the high-ability pupils as well as for the regular ability pupils, indicating that – in line with SDT – these basic needs are universal needs applying to everyone, regardless of background or ability levels (Ryan and Deci 2001). This contrasts with Mills (2003) who suggested that high-ability pupils benefit most when their teachers possess very specific characteristics, whereas the outcomes of this study suggest that teaching high-ability students requires teaching strategies that benefit regular-ability students as well.

Both high-ability and regular-ability pupils mentioned relatedness most often. Pianta, Hamre, and Stuhlman (2003) have shown the importance of positive relatedness between pupils and teachers, for pupils' well-being and developmental outcomes. Probably, this goes for all children; in our study no significant differences in the need for relatedness were found between the two groups of pupils. Both groups mentioned most characteristics which are preferred of good teachers as those having to do with the need for relatedness. The specific teacher strategies that support this need mostly corresponded to high-ability and regular-ability pupils, too. Both groups mostly referred to affection. This refers to characteristics like "always listens to me", "very gentle", "available to talk to" and "trustworthy": aspects that are likely to support pupils' motivation and also contribute to their well-being (Noble and McGrath 2014). Attuning to pupils' needs (e.g. showing understanding) was also mentioned often by both groups, but more often by the high-ability pupils, especially by the high-ability girls. This could suggest that high-ability pupils find it more important that the teacher attunes to their needs. It could also suggest that high-ability pupils, more often than regular-ability pupils, experience that teachers do not attune to their specific need very well. Some teachers may find it difficult to understand high-ability students and as such, may find it harder to attune to their needs (Bakx et al. 2016).

Competence support was also mentioned by both groups of pupils on a regular basis. Especially guidance (e.g. "instructive" and "getting help when I need it") and clarity (e.g. "having rules and routines" and "making sure rules are followed") were mentioned frequently. Many teachers hold the belief that high-ability students "will make it on their own" and need less support (Bakx et al. 2016). Yet, these outcomes indicate that high-ability students need just as much structure as other students do. Expressing high expectations and presenting a challenge have been studied extensively as effective strategies for high-ability pupils (for a review, see Bailey et al. 2012). Therefore, it is not surprising that these aspects of competence-support were mentioned more frequently by high-ability pupils. High-ability pupils indicated more often than regular-ability pupils that their ideal teacher encourages them

intellectually, by providing challenge and encouragement. Garn and Jolly (2013) also found that high-ability pupils preferred learning experiences connected to their (intellectual) interests, preventing boredom.

Autonomy support was mentioned far less frequently in both groups than teaching strategies supporting relatedness and competence. When autonomy was mentioned, both groups most frequently referred to choice. Surprisingly though, high-ability pupils mentioned choice less frequently than regular-ability pupils did. This contradicts previous studies (for example Betts 1985) which suggested that especially high-ability pupils benefit from being offered choices. A potential explanation for these counter-intuitive findings could be that high-ability pupils are already offered more choices than other pupils, because of their interests and, sometimes, high pace of studying (Bakx et al. 2016), and as such, did not explicitly mention this as something they needed. This might be so because the high-ability pupils participating in our study all attended programmes for high-ability pupils, already offering the pupils many choices in e.g. subjects, way of learning, learning materials.

Remarkably, teacher characteristics such as intelligence, knowing a lot or being smart were not mentioned very often. When these characteristics were mentioned, it was mostly by high-ability boys. This is remarkable because in Mills' study (2003) one of the most prominent conclusions was that outstanding teachers for high-ability students resemble their students in cognitive and personality style. Mills concluded that intelligence and being an expert in the area the teacher teaches might even be more important for being a good teacher for high-ability pupils than formal teaching qualifications. The pupils in our study seemed to prefer teacher characteristics having to do with a good relationship between pupils and teacher more than intelligence as a teacher's characteristic. This difference in findings between Mills' study and ours might be explained by the age difference of the participants. Our pupils were children in primary school (10 to 12 years old), while Mills' students were older (13 – 16 years old). It might be the case that younger children think a teacher who is able to relate to them is more important than having an expert-teacher. This might have to do with the Dutch educational system, too: primary school teachers teach one and the same group of pupils all week (25 h a week) in all subjects. Dutch primary school teachers are "generalists" and must be able to teach their pupils all subjects (Jan Bent, Bakx, and den Brok 2014). After primary school, pupils enter secondary education and are taught by different teachers for each subject area. Maybe, then, Dutch pupils would also mention more characteristics having to do with intelligence or subject expertise for being a good teacher.

Gender differences

All pupils – regardless their gender or ability – mentioned relatedness most frequently, followed by competence and autonomy. However, *within* the high-ability group and *within* the regular-ability group, there were some interesting gender differences. In the high-ability group, there were more gender-related differences than in the average ability group. Preckel and colleagues' study (2008) also showed more differences in their high-ability group of pupils than in their other group of pupils.

Relatedness was mentioned as frequently by boys and girls, within the high-ability as well as within the regular ability group. Within the specific subcategories of relatedness, no differences between regular-ability boys and girls were found. This is somewhat surprising as previous research has found rather substantial gender differences in the teacher–pupil

relationship. Spilt, Koomen, and Jak (2012), for example, found closer and less conflictual relationships of teachers with (regular-ability) girls than with boys, even though boys are consistently found to benefit more strongly from a good relationship with their teacher (Roorda et al. 2011). For high-ability pupils, we found that high-ability girls mentioned attuning to pupils' needs more frequently than high-ability boys. Attuning to pupils' needs can be done by listening well to pupils and showing them understanding. High-ability girls more often have lower self-esteem than high-ability boys (Smutny 2003), and may therefore find it more important to have a teacher who listens and understands their needs to help them feel a bit more secure. Another possible explanation for this gender-specific difference found, might be due to gender differences in (high-ability) pupils' communication and listening skills (Gurian and Stevens 2004). Mills (2003) stated that high-ability pupils' own characteristics seem to match up most with *excellent* high-ability teachers' characteristics. This might imply that female pupils compared to male pupils, have stronger preferences for characteristics such as listening, understanding and empathy, because high-ability girls themselves seem to possess these characteristics more than high-ability boys. However, more research is needed in order to explain these findings, possibly in relation to pupils' own characteristics.

Furthermore, high-ability girls also mentioned teacher characteristics related to fostering relevance, like teaching thematic classes (autonomy supporting) more than the high-ability boys did. This aligns with findings among regular ability pupils in a study by Hornstra et al. (2015). They found that regular-ability boys benefited less from authentic learning strategies that are aimed at fostering the relevance than regular-ability girls did. Yet, no gender differences regarding autonomy support were found in the regular-ability group. Preckel and colleagues (2008) showed that high-ability girls demonstrated lower levels of interest and mastery and performance motivation than high-ability boys. This may indicate that high-ability girls, as compared to high-ability boys, are somewhat more dependent on their teacher to evoke motivation and interest through strategies such as explaining the relevance of what is learned.

Finally, we found that high-ability boys referred to competence-support more often than high-ability girls whereas the reverse was found for the regular-ability group, in which the need for competence was mentioned more often by girls than by boys. High-ability boys mentioned "intelligence" or "being smart" somewhat more often than high-ability girls, which explains only part of this difference. For high-ability pupils, none of gender differences within the specific categories within the category competence reached statistical significance, which makes it difficult to understand or explain why competence-supporting strategies were mentioned more often by high-ability boys than high-ability girls. Given previous findings that girls, especially high-ability girls, tend to feel less competent than boys (e.g. Smutny 2003; Preckel et al. 2008), the results for the high-ability group seem somewhat surprising. Perhaps, high-ability girls consider affective relatedness-supporting strategies, i.e. attunement to their needs, to be a more effective way to foster their need for competence, whereas boys may prefer more cognitively oriented strategies to foster self-concept. However, given the small magnitude of the differences, it goes too far to suggest that high-ability boys and girls would benefit from such distinct teaching strategies.

This study also provided insight on suitable methodologies for assessing preferred teaching practices for young pupils. In line with other studies using open, qualitative methods for assessing primary school pupils' views (Bakx et al. 2015; Bent et al., 2013), all participants seemed able to express their views on desirable teacher characteristics using this open way

of asking. This open, non-restrictive way might have revealed other insights than a structured questionnaire might have done. However, the data-analysis with this open questionnaire is time-consuming and complex.

Limitations and future research

With our instrument, pupils could not elaborate much on their answers. It is therefore unknown to what extent pupils perceived their teachers to possess or conduct the teacher characteristics they identified as important to them. Both the presence and lack of these characteristics in their own teachers could have prompted certain answers. Yet, as this would be the case for pupils in the different groups, this is not expected to have had a large impact on the outcomes of the present study. However, in future research, pupils might additionally be questioned by means of semi-structured interviews. Doing so, an explanation could be asked on the answers given in the teacher-spider (or other instrument) and extra questions could be asked. Then, it would also be possible to ask pupils whether the characteristics preferred of good teachers and needs they had, were actually met by their teacher(s) and if not, how these needs can be met according to the pupils themselves.

Another limitation is the selection of the pupils in our study. All high-ability pupils were selected by their schools for part-time or fulltime education for high-ability pupils. These programmes varied somewhat in their selection criteria, creating a rather diverse group of high-ability pupils. Likely, also the regular education group included high-ability pupils. The differences found in this study would perhaps be even more pronounced when all high-ability pupils in regular education could have also been identified. In future research it might be possible to have all participating pupils complete some kind of an IQ-test, but it might be difficult to gain cooperation on a large scale for this (because of time and effort) and one single test might not detect all high-ability pupils either.

In future research it might be interesting to repeat our study, but then with older pupils in secondary education, or, if possible, questioning the same pupils in our sample again when they are in secondary education, in order to investigate whether pupils' views on good teachers develop, for example, towards a view in which teacher's expertise plays a larger role, like Mills (2003) found.

Practical implications

The outcomes of this study show that high-ability pupils, like regular-ability pupils, benefit from teaching strategies supporting their needs for relatedness, competence, and autonomy. Good teaching for high-ability pupils – according to these pupils themselves – does not require higher levels of autonomy-support or relatedness. Even more, these pupils prefer just as much competence support as regular-ability pupils, contrary to the popular belief that high-ability pupils “will make it on their own”. As such, applying teaching strategies promoting relatedness, competence, and autonomy in classrooms will benefit high-ability pupils, as well as regular-ability pupils.

Asking specific groups of pupils on their preferred teacher characteristics can shed light on teachers who can foster these pupils' basic needs. These first, explorative findings could also be used in the teacher training colleges, asking student teachers to reflect on this (Bakx et al. 2015).

The fact that pupils were well able to complete an open instrument like the teacher-spider, might imply that pupils can be of help in collecting feedback on need-supportive teacher behaviour, for example, as information source in schools' quality management. In this way, studies and instruments like this might be valuable to gain new insights as well as to put these insights into practice.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

Anouke Bakx is an associate professor and academic director of the master programme Learning and Innovation; Ton van Houtert is a psychologist and works as a lecturer and teacher-researcher.

Maartje van den Brand is coordinator of the Talentprograms for high-ability children; she is also a teacher of high-ability pupils and teacher-researcher; Lisette Hornstra is an assistant professor at Utrecht University. Her work focuses on the ways in which teachers can promote (high-) ability pupils' motivation for school.

ORCID

Anouke Bakx  <http://orcid.org/0000-0003-2983-2962>

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