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for Gifted Children: Effects on Social–
Emotional and Academic Functioning*

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The Pullout Program Day a Week School for Gifted Children: Effects on Social–Emotional and Academic Functioning

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Abstract

Background Gifted children learn differently compared to their peers in several ways. However, their educational needs are often not met in regular schools, which may result in underachievement and social–emotional and behavioral problems. A pullout program, the “Day a Week School” (DWS), was offered to gifted children in 25 elementary schools from neighborhoods of higher and lower SES in Amsterdam.

Objective To investigate whether DWS decreases children’s social–emotional and behavior problems and parents’ stress, and improves children’s self-concept, enjoyment at school, and academic achievement.

Methods Gifted children (grades 3–5) were selected through a standardized identification procedure assessing “out-of-the box”, logical, and creative thinking and motivation ($n = 89$). Children, as well as both their parents and teachers, completed questionnaires

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before the start of DWS and after 2,5 months. Results were analyzed for all children and for at-risk children with higher levels of psychopathology before starting DWS.

Results Analyses on the total group showed small positive effects on children's self-reported self-concept dimensions, scholastic competence and behavioral conduct, as well as on fathers' reported child prosocial behavior. In the at-risk group, children reported medium positive effects on scholastic competence and behavioral conduct, and on sleep problems and worry, and small improvements on enjoyment at school. Parents of at-risk children reported decreased child's somatic complaints and decreased social-emotional and behavioral problems. Finally, teachers reported higher academic achievement and medium positive effects on inattention-hyperactivity in the at-risk group.

Conclusions Day a Week School appears to be a promising pullout program for gifted children, particularly for children at-risk for psychopathology.

Keywords Gifted children · Special education · Pullout program · Social-emotional functioning · Academic functioning

Introduction

The current educational system is built on the assumption that all learners that belong to the same age group have a comparable intellectual development, and consequently most curricula, teaching materials and practices are designed for the "average" learner (Osin and Lesgold 1996; Rogers 2002). In this school system some children will inevitably be engaged below their potential, while others will struggle to keep up with the learning process (Osin and Lesgold 1996). While there is general agreement that special services for children with learning disabilities should be offered, it is still not fully recognized that also gifted children have specific needs (Morawska and Sanders 2009). Gifted children are developmentally and cognitively different from the general population (Kearney 1996). It is important to acknowledge these differences and that, as a result, gifted children may have different educational needs. Denying these differences may lead to inappropriate education, which in turn may lead to frustration and boredom in gifted children (Webb et al. 2005; Gallagher et al. 1997).

Educational Needs and Problems of Gifted Children

Winebrenner (2000) argues that gifted students learn differently compared to their peers in at least five important ways. First of all, these children need less time to study new material. Secondly, they remember better what they have learned, which makes repeating previously mastered concepts unnecessary. Thirdly, they perceive the learning material at a more abstract and multifaceted level than do their classmates. Fourthly, they become passionately involved in specific topics and find it hard to move on to other topics until they feel satisfied that they have mastered them as much as they possibly can. Fifthly, gifted children can operate on several levels of concentration at the same time, meaning that they can monitor classroom activities without paying direct or visual attention to them. Finally, Van Kessels (2009) adds that gifted children reason 'top down' (i.e. reasoning from a general proposition to derive to a specific example), in contrary to the average children who think 'bottom up' (i.e. reasoning from specific examples to a general

proposition). Reasoning 'bottom up', working to a final target step by step, is often found unchallenging and aggravating by gifted children.

Despite these learning differences, the majority of gifted children still find themselves in one-size-fits-all schools (Kearney 1996). Full inclusion in educational settings has been presented as a desirable situation, whereby all children, including children with severe disabilities and highly gifted children, should be placed in a regular classroom. However, the vast majority of educational systems struggle with adequately meeting the educational needs of gifted children and the focus is most often on average and weaker learners (Archambault et al. 1993; Osin and Lesgold 1996). Generally, teachers only make minor modifications in their curricula and in their instructions to meet the needs of gifted students (Archambault et al. 1993). Most classroom teachers have not received training focused on how to meet the needs of gifted students and therefore the knowledge about gifted children needed to provide adequate and challenging education is often lacking (Archambault et al. 1993; Moon et al. 1995; Reis and Purcell 1993; Rogers 2002). This makes the current educational system frequently insufficient for gifted children.

Since they are regularly not given the kind of instruction that is appropriate for their needs, gifted children (and their parents) are forced to face the issue of inadequate education on their own, which can result in an increasing sense of isolation (Kearney 1996). In extreme cases, highly gifted children do not attend school at all; they are homeschooling instead after negative experiences in the regular classroom (Gross 1993; Tolan 1985). A frequent problem is that gifted learners are hardly being offered demanding learning experiences (Winebrenner 2000). Csikszentmihalyi et al.'s (1993) study of talented teenagers noted that when these individuals cannot "move forward" in their area of talent, they perceive a rise in stress, boredom and existential depression (i.e. depression that arises when an individual confronts certain basic issues of existence, like the meaning of life; Yalom 1980).

As a sense of confidence derives mainly from being successful at something perceived as being difficult (Rimm 1990), gifted learners may lose confidence in their capacity to perform well on challenging learning tasks. Many of these children learn to find the easiest way out, delaying their exposure to challenge in patterns of underachievement (Rimm 1990; Schmitz and Galbraith 1985). Gross (2006) describes a number of negative effects experienced by extremely gifted children (i.e. with IQs of 160 and above) that were retained for the duration of their schooling in a regular classroom with age peers (the inclusion classroom). A higher number of dropouts, problems with social relationships and psychological problems like depression were reported. Ironically, the highly gifted children attending *inclusion* classrooms did not experience the feeling of being included in the least (Gross 2006).

Proposed Solutions in Meeting the Educational Needs of Gifted Children

Altogether, gifted children learn differently compared to their peers in several ways, and therefore have different educational needs. Current educational systems are often focused on the average learners and, consequently, fail to adequately meet the educational needs of the gifted children. To meet the needs of gifted children, adaptations in education are required. Gifted children have already mastered much of the grade-level learning material. Therefore they should be offered opportunities to work at more advanced levels of difficulty and depth and to bring their own passionate interests into their study material (Winebrenner 2000). Since gifted children need less time to study new material, endless

repeating of exercises should be avoided. Gifted children should be given the chance to accelerate through the study material on a higher rate than average learners (Rogers 1991).

Social–Emotional Needs and Problems of Gifted Children

Although it seems logical that gifted children learn differently and therefore have different educational needs, there is more ambiguousness about the social–emotional needs of gifted children. Currently, there are no large-scale longitudinal or comparison studies with epidemiological data on the prevalence and distribution of social–emotional problems among gifted children (Pfeiffer and Stocking 2000; Martin et al. 2010). For this reason, it is unclear whether gifted children are more or less likely than other children to experience social–emotional problems (Peterson 2009). Some studies find gifted children to be less vulnerable to the development of psychological problems (Neihart 2002; Baker 1995; Barnett and Fiscella 1985; Eccles et al. 1989; Gust-Brey and Cross 1999; Kelly and Colangelo 1984; Parker 1996; Reynolds and Bradley 1983; Seeley 1984) while other studies find that they are more vulnerable (Freeman 1994; Czeschlik and Rost 1994; Garner 1991; Kwan 1992; May 1990; Coleman and Cross 1988; Roedell 1984; Renzulli 1981; Whitmore 1980).

Despite the lack of consistent evidence that gifted children necessarily experience more social–emotional problems than average children, Peterson (2009) warns that positively stereotyping gifted children can cause underidentification of the gifted child's problems. That is, gifted children may not expose their vulnerabilities to parents and teachers, preferring to maintain a positive image instead. Other obstacles in identifying social–emotional problems in gifted children are their ability to compensate for or mask concerns and their belief that they must solve their problems autonomously (Peterson 2009).

On the one hand, gifted children have specific strengths (including their cognitive abilities) that make them more resilient, on the other hand, however, gifted children seem to have specific needs and characteristics that make them more vulnerable to the development of social–emotional problems (Pfeiffer and Stocking 2000; Webb et al. 2005). One of these specific characteristics is asynchronous development across the cognitive, emotional, social and physical domain (Roedell 1984, 1986; Webb 1993; Silverman 1997). Morelock (1992) states that these children often feel “out of place” and different from their peers. Feeling different is associated with lower self-esteem (Janos et al. 1985). The asynchronous development may be more harmful for the extremely intellectually gifted, who feel even more “out of sync” and frustrated, especially when their emotional maturity lags far behind their extraordinary intellectual development (Hollingworth 1926; Webb 1993). Another vulnerability associated with giftedness is overexcitability (Porter 2005; Pfeiffer and Stocking 2000), i.e. a high level of activity on several domains: psychomotor, sensual, imaginal, intellectual and emotional (Silverman 1994). Teachers and parents, as well as peers, often find this level of activity disturbing. Incorrectly diagnosing this behavior as ADHD is not uncommon, nor is it uncommon to give these children ADHD treatment like medication (Webb et al. 2005). Gifted children's intellectual or emotional overexcitability may also prompt their mind to churn for some time, after they lie down in bed (Webb et al. 2005), causing a delay in falling asleep. Whether distinctive sleep patterns are actually associated with giftedness, is, however, still unclear (Webb et al. 2005). Still another characteristic associated with giftedness is perfectionism (Webb 1993; Pfeiffer and Stocking 2000; Porter 2005). Gifted children regularly set unrealistically high expectations for themselves; perhaps 15–20 % may be hindered significantly by perfectionism at some

point in their academic careers, and even later in life (Webb 1993). Gifted children are also associated with moral sensitivity (Porter 2005; Pfeiffer and Stocking 2000). They are often concerned with the state of the world and may feel that it is their responsibility to solve the problems that they observe. This can be an enormous burden on a young person and can lead to frustration and depression for the child who is unable to meet his or her extremely high goals (Pfeiffer and Stocking 2000).

When the environment does not adapt to the gifted child's specific needs and characteristics, social–emotional problems may occur (Pfeiffer and Stocking 2000). An environmental factor that may negatively interact with some of the vulnerabilities associated with gifted children is, for example, unrealistic expectations of parents and teachers, leading to a distorted sense of ability and success in the child (Freeman 1994; Webb 1993). As a consequence, the gifted child may (especially when the child has a perfectionistic character) feel pressured and anxious, and may avoid risks, which in turn could lead to underachievement (Webb 1993; Pfeiffer and Stocking 2000).

Furthermore, gifted children may have difficulties with their peer group. Because of their uneven development they may have trouble finding an appropriate peer group or being accepted within the desired group. Other children may see the critical thinking of the gifted child as intolerance to others and their advanced vocabulary as “know it all” arrogance (Pfeiffer and Stocking 2000). The difference in cognitive development can also cause misunderstandings between the gifted child and his peers (Webb 1993). Moreover, gifted children with extreme moral sensitivity are more sensitive to criticism and peer rejection (Webb 1993), which can lead to emotional problems.

Finally, gifted students as a group frequently suffer from a mismatch between their cognitive capabilities and the instructional environment. As outlined in the former paragraph, they often are understimulated, which leads to boredom, frustration, anger and disengagement from school (Gallagher et al. 1997; Plucker and McIntyre 1996; Freeman 1994; Webb et al. 2005). One of the most pervasive problems among gifted children is underachievement (Reis and Renzulli 2004; Whitmore 1986).

Proposed Solutions in Meeting the Social–Emotional Needs of Gifted Children

Altogether, it seems important to take account of the educational as well as the social–emotional problems and needs of gifted children, especially when they experience one or more vulnerabilities associated with giftedness. Being in a class with other gifted children, who experience a more similar development, may give gifted children a sense of recognition instead of feeling different. Furthermore, being among other gifted children reduces the chance of misunderstandings when they interact with their peers. It could be easier for them to find and be accepted in an appropriate peer group. Concerning the gifted children with overexcitability, it is an important challenge for parents and teachers to provide opportunities to channel the energy of these children in a topic of interest (Pfeiffer and Stocking 2000), instead of giving these children ADHD treatment like medication. For this reason, teachers of gifted children should be more flexible in adapting the curriculum that they offer to these children. Furthermore, teachers and parents should recognize specific characteristics as heightened moral sensitivity and perfectionism and sensitively respond to it. Teachers could, for example, place greater emphasis on the learning process instead of the learning results when a child already sets too high standards for him or herself. This could reduce the pressure the child experiences.

Parental Stress in Parents of Gifted Children

Empirical studies investigating the parenting experiences of parents with gifted children are scarce (Morawska and Sanders 2009) and research on the nature and amount of difficulties that these parents experience or about their levels of parental stress is lacking. However, there is research suggesting that these parents may be confronted with specific stressors that other parents do not experience (Silverman and Kearney 1989; Morawska and Sanders 2009; Jolly and Matthews 2012; Keirouz 1990).

Silverman and Kearney (1989) argue that parents of gifted children may experience more stress than other parents in determining appropriate education provisions for their child. These parents frequently report feelings of inadequacy and frustration with schools not meeting their children's needs (Keirouz 1990; Silverman and Kearney 1989; Hackney 1981). Parents may even feel that they should move to a new community in order to find schools that better meet the needs of their gifted children (Hackney 1981). Additionally, parents of gifted children may experience more stress in dealing with society's lack of understanding and responsiveness towards their gifted child (Silverman and Kearney 1989). Parents sometimes receive negative responses from the community (Feldman and Piirto 1995) and they often feel unsupported (Alsop 1997). Webb et al. (2007) discuss that, in addition to the parents' role in the school setting, parents also play a fundamental role in the home setting with regards to raising their gifted child. The complex nature of parenting itself, in combination with the specific characteristics and needs gifted children may have (as outlined previously), makes parenting a gifted child a complicated and multifaceted challenge (Jolly and Matthews 2012). When parents of gifted children are asked about the assistance that they need for their children, they frequently report that they require support not only with meeting their child's educational needs, but also with aspects of parenting (Morawska and Sanders 2009). The specific stressors related to rearing gifted children may lead to a higher amount of parental stress.

Special Education for Gifted Children

Although the literature supports an adapted approach for gifted children for an optimal and healthy development (Morawska and Sanders 2009; Kearney 1996; Archambault et al. 1993; Osin and Lesgold 1996), deeply rooted societal attitudes as well as egalitarian and democratic views have prohibited thinking that gifted students should be given special attention for their educational and social-emotional needs (Peterson 2009). Federal education mandates have also expressed little concern for the well-being of students with high-level abilities (Peterson 2009). Geake and Gross (2008) describe hostility in society towards special education for the gifted, with people being afraid of the development of intellectual elites. Consequently, there has been resistance to the embracing of special education for the academically gifted. Furthermore, it is often assumed that gifted children do not need adjusted educational services (Gross 2006). Winebrenner (2000) gives two other reasons for neglecting the needs of the most capable learners: the erroneous assumption that gifted children must be learning when they score fairly high on assessments and the use of gifted students to facilitate forward progress for other students. Furthermore, concerns for social or emotional harm to students contribute to the resistance of special educational services for the gifted (Colangelo et al. 2004; Southern et al. 1989). For example, parents express concerns that acceleration will isolate their children or will be too emotionally stressful (Neihart 2007). Finally, some children will not be identified as

being gifted and will therefore receive no adapted education; this is particularly true for children whose abilities may be disguised with learning disorders, like dyslexia, which can also exist in gifted children (Brody and Milss 1997).

Despite the insufficiency of education meeting the needs of gifted children (Osin and Lesgold 1996), differentiated instruction for gifted children is gradually becoming more accepted. Acceleration and enrichment are being considered as the most important educational adjustments for gifted children (Renzulli et al. 1982; Rogers 1991). Acceleration and enrichment exist within the regular classroom and in special educational services for gifted children. Enrichment is, for example, included in pullout programs and summer or weekend enrichment programs, where new or in depth learning material, adapted to the gifted children, is presented. Acceleration implies going through the learning process at a faster rate. This can take the form of, for instance, early entrance to school, grade skipping, curriculum compacting, grade telescoping (i.e. shortening the school period by 1 year), subject acceleration (i.e. going through the material of one subject at a faster rate) and early admission to college (Rogers and Kimpston 1992). Currently, education for gifted children exists in various forms, from complete integration of these children within the regular classroom to complete segregation of gifted children in separate schools (Delcourt et al. 2007). Various forms of grouping practices, offering special education for gifted children, are outlined below (Rogers 2002; Delcourt et al. 2007; Gallagher et al. 1983; Kulik and Kulik 1992):

Multilevel classes: Children in the same grade are divided into groups (often high, middle and low groups) on the basis of ability. The groups are instructed in separate classrooms either for a full day or for a single subject.

Within-class grouping: The class will be divided into smaller groups for instruction according to the abilities of the children. Every group then devotes a proportionate amount of time working directly with the teacher, while the other groups work by themselves on other assigned learning tasks.

Cross-grade grouping/between-class ability grouping: Children from different grade levels in a school get selected on the basis of their level of achievement in a subject and the children of this group are then taught the subject in a separate classroom.

Pullout programs: Gifted children are removed from the regular classroom for a portion of the school week. During this time, they engage in enrichment or extension activities in special classes with other identified gifted children.

Separate class programs: Children are grouped by ability for most or all of their academic class work. Students in the gifted program have little classroom contact with other students, although they may have joint classes for subjects such as music, art or physical education.

Special schools: Gifted children are housed in a separate building where they take all of their classes together and receive all instructions at a more advanced pace.

Effects of Special Education for Gifted Children

An important question raised due to the dissatisfaction of the current educational system for gifted children is: which forms of education are actually effective for gifted children? Although additional research is required before it can be determined what educational intervention is most effective (Van Tassel-Baska 2000; Colangelo et al. 2004), some conclusions can be made due to research on this subject. Research on different forms of education for gifted children frequently uses achievement as outcome measure and less

often social–emotional functioning. The effects of different forms of education for gifted children will be outlined below, starting with the description of the effects of (minor) modifications in the class and continuing with programs that increasingly offer more adaptations, like pullout programs and finally separate class programs.

Effects on Academic Achievement

Kulik and Kulik (1992) conclude with their meta-analytic findings that multilevel classes, which entail only small modifications of course content for groups of gifted children, generally have little or no effect on achievement. Programs that foster a more substantial adjustment of curriculum to the abilities of the gifted children however, such as within-class grouping produce positive effects (Kulik and Kulik 1992). Slavin (1987) found in his review small positive academic outcomes supporting within-class grouping in mathematics. He also found small positive academic outcomes on cross-grade grouping for reading. Kulik and Kulik (1992) found substantial positive academic effects of cross-grade grouping.

Vaughn et al. (1991) found in their meta-analysis small to medium effects on academic achievement of pullout programs for gifted children. Delcourt et al. (2007) investigated and compared the effects of various gifted programs. Their results demonstrate that, in terms of achievement, gifted children participating in pullout programs show significantly higher levels of achievement than do both their high-achieving peers that are not involved in special programs and those attending within-class programs.

Academic effects are also found for gifted students enrolled full-time in separate class programs (Kulik and Kulik 1982, 1984, 1990; Vaughn et al. 1991). Vaughn et al. (1991) found substantial increase in achievement of gifted students attending separate class programs and special schools, compared to high-achieving peers not involved in special programs and high-achieving peers attending within-class programs.

Kulik and Kulik (1992) note in their review that programs of enrichment and acceleration, including the largest amount of curricular adjustment, show the largest effect on academic achievement. The positive academic effects of acceleration are steadily being confirmed by new research (Colangelo et al. 2004).

To summarize, the different forms of special education for gifted children all show positive academic effects. The largest effects are found in full-time grouping and in programs with curricula that are the most adapted to gifted children. With offering more complicated knowledge and skills, a significantly larger development occurs in these children. Gifted children need to be challenged, which necessitates some form of regrouping, whether for an entire class of gifted children or a cluster group. Rogers (2002) reports that an average of one-third to one half an additional year's achievement growth should be possible within a school program of talent development.

Effects on Social–Emotional Functioning

Relatively few studies included the effects of special education for the gifted on other areas than academic achievement. The effects of special education for the gifted on social–emotional functioning are often not reported and outcomes are more ambivalent, making it difficult to derive conclusions (Rogers 1991). An outline of these effects is presented below.

Research has been conducted on investigating the effects of special education for gifted children on self-concept. A person's self-concept can be defined as a composite view of

oneself (Bong and Skaalvik 2003) and is formed through relationships with others and the development of self-knowledge (Delcourt et al. 2007). Some studies distinctly describe the effects of special education for gifted children on *academic* self-concept, referring to individuals' self-concept beliefs that are formed specifically towards academic domains (Bong and Skaalvik 2003). Kulik and Kulik (1992) found in their meta-analysis that grouping in multilevel classes tends to raise the self-concept scores of lower achieving students and to *reduce* the self-concept of the higher achieving students. However, the effects found are very small and not all significant. Lou et al. (1996) found in their meta-analysis small, significant positive effects on the general self-concept and no significant effects on academic self-concept for within-class grouping. Vaughn et al. (1991) and Kulik and Kulik (1992) found a very small and trivial meta-analytic positive effect on general self-concept by pullout or enrichment programs for gifted children. When full-time grouping is initiated (in separate class programs or special schools), there is a slight *decrease* in (academic) self-concept (Delcourt et al. 2007; Rogers 1991).

Delcourt et al. (2007) compare different forms of special education for gifted children. They conclude that, although gifted students from separate class programs show the highest achievement of all children, they have the lowest academic self-concept. This can be explained by the so-called "big-fish-little-pond-effect" (BFLPE: Marsh and Parker 1984; Marsh et al. 1995). The BFLPE hypothesizes that it is better for academic self-concept to be a big fish in a little pond (i.e. gifted learner in regular reference group) than to be a small fish in a big pond (i.e. gifted learner in gifted reference group). According to this theory, the academic self-concepts of students will decrease when they are placed in a homogenous gifted class. The BFLPE is widely replicated in different countries (Coleman and Fults 1982; Zeidner and Schleyer 1998; Marsh and Hau 2003; Marsh et al. 2004). Critics, however, warn that a lower academic self-concept in this case is not necessarily negative (Neihart 2007). Plucker et al. (2004) reason that it is possible that self-concepts are reduced but remain high (i.e. a modesty effect). To conclude, although research shows that full-time grouping produces a small decrease in (academic) self-concept, effects on general and academic self-concept concerning other forms of gifted education remain ambivalent and unclear.

Aside from self-concept, some studies have also researched the attitudes of gifted children towards school or school subjects. According to Roger's overview (1991), ability grouping moderately improves the attitudes of gifted children towards the subjects they attend. Lou et al. (1996) found a positive relationship between within-class grouping and students' attitudes (including attitudes to subject matter, peers and school). In particular, students in the grouped classes had significantly more positive attitudes towards the subject matter concerned. Olenchak (1990) found that attitude towards school was more positive for gifted students attending an enrichment program as compared with a comparison group. Acceleration seems to have little effect on students' attitude towards school and participation in school activities (Kulik and Kulik 1992). Homogeneously grouping on a full-time basis moderately improved the attitudes towards the subject for all ability learners (Kulik and Kulik 1982, 1990). Taken together, most forms of special education for gifted children improve the children's attitudes towards the school (subjects).

Delcourt et al. (2007) evaluated social effects of different forms of special education for gifted children. They report no differences regarding social perspectives between gifted children attending various special programs and gifted children not attending special programs. Rogers (2002) reports no effects on socialization (including social skills, social maturity, participation in extracurricular activities, leadership activities and peer interaction ratings) when gifted students are placed in multilevel classrooms. According to Kulik

and Kulik (1992) acceleration appears to have little or no effect on students' popularity. Rogers (2002) reports no social effects when gifted students are allowed early admission to college (therefore skipping twelfth grade). Moderate socialization effects have been reported for grade telescoping (i.e. completing the school's curriculum of several years in 1 year less time) and advanced placement programs (Rogers 2002). There has been no research reported on the socialization effects of subject acceleration or with curriculum compacting (Rogers 2002). In conclusion, most research on the effects of special education for gifted children demonstrates no effect on social outcome measures, with the exception of grade telescoping and advanced placement programs, in which positive socialization effects were found.

Delcourt et al. (2007) evaluated motivational effects of different types of special education. They report that gifted students from separate class programs preferred the least to work on their own, preferred fewer challenges and viewed their learning environments as highly teacher oriented as compared to gifted peers from within-class, pullout programs and the gifted comparison group. What can be expected, however, is that these students got offered more difficult tasks than gifted students in the other programs or in the regular classroom. Students of the separate class programs were possibly being challenged enough and did not want more difficult work as they were already working to their full capacity.

Conclusion

Although special education evidently can enhance academic achievement, considering also the social-emotional effects, it is still not clear which form of education is the most appropriate for gifted children. Evaluating the research on special education for gifted children on social-emotional effects, no clear pattern of improvement or decline can be established and more research concerning the social-emotional effects is necessary (Rogers 2002). Solely adaptations within the classroom seem to have little academic effects. On the other hand, special schools for gifted children, giving the most academic effects, can cause lower self-concepts and less preference for challenging tasks. These findings give support for a form that is in between these extremes; a pullout program, taking place for a substantial proportion of the week (1 day a week), could be a viable option.

Advantages of a Pullout Program

In a pullout program, the taught material will be differentiated according to the level and pace of the gifted children. As a consequence, the children will be more involved at their level and will not have to wait a substantial part of the lesson for other children to understand what they have already mastered. In a pullout program, gifted children do not have to compromise their aspirations or pace of learning to accommodate the lower-ability students. Another advantage of a pullout program is that the teacher does not have to focus on the basic skills, and can concentrate on higher-level thinking and research skills. This offers the children a more challenging environment, where they possibly get a more positive attitude towards learning.

Participating in a pullout program, gifted children have the possibility of interacting with both non-gifted children in their regular classroom and gifted children in the pullout program. A pullout program gives gifted children a worthwhile experience of being and

interacting with children in which they can recognize themselves. Together with their gifted peers they do not have to feel “different” and may feel more freedom to be themselves.

The fact that these gifted children are not excluded full-time from the regular classroom could be positively affecting both the gifted children and non-gifted children. In this way, the general group of children can learn from the gifted children. In support of the idea that the rest of the class can benefit from the influence of highly gifted children and their pullout education, Hoffer (1992) notes that for any child to be in a higher-achieving class has a positive effect on achievement. Although ability grouping benefits the high-ability students, it negatively affects the low-achieving students (Betts and Shkolnik 2000). Therefore, full-time excluding the higher-ability students from the regular class could have a negative effect on the lower-ability students. Excluding the gifted children for only 1 day a week prevents these negative effects and, at the same time, gives the teacher of the regular class more time to meet the individual needs of the other children in class during this day. Considering the gifted children, being also part of a regular class gives them the opportunity to learn how to interact with non-gifted peers. Furthermore, it avoids being a “small fish in a big pond” and gives them also a regular reference group to measure their (academic) self-concept. In this case, no negative influence on their self-concept is expected. Gifted children in a pullout program compare themselves both with regular and gifted children, creating a realistic self-concept. Being offered more challenging and stimulating education, and being surrounded by ability like peers where gifted children feel recognition, could (especially for children with lower self-concept or with other social-emotional problems) enhance the self-concept and the general well-being of these children. Gifted children may feel taken more seriously and valued, they may feel that they are not alone in being gifted and they may feel more of a connection with the children with the same-like abilities.

Furthermore, parents may experience a pullout program as supporting and feel relieved that special attention is being given to challenging their child and creating an optimal environment for them. In this way, a pullout program could decrease parental stress levels. This may be especially true for the parents experiencing higher levels of parental stress beforehand, struggling with the gap between their child’s needs and the possibilities offered by the school environment.

It is important that such a program is implemented adequately and that the teachers of the regular classroom are well informed about the program and positively involved. The teachers of the regular classroom have to be willing to co-operate and compact the regular curriculum material of the gifted child into less days. For the gifted children participating in a pullout program, this means that, in some form, they have to accelerate through their normal curriculum. In this way, they experience an enrichment program outside the class and a form of acceleration in their regular class at the same time. This can lead to reduced boredom, frustration and behavioral problems in their regular class.

The Day a Week School

In this study, a pullout program for talented children, named DWS, will be evaluated. Gifted and talented children attend this program one whole day in the week; the remaining three and a half days they continue attending their regular class (in the Netherlands children have one afternoon a week free from school). The aim of this study is to

investigate whether the pullout program DWS is an effective intervention. As informants, the children themselves, their teachers and both their parents were included in the study. Given the lack of research on the social–emotional effects of special educational programs for gifted children, this will be the main focus of this exploratory study. Since there is not much knowledge about the scope of social–emotional problems in gifted children, we first compare the social–emotional problems of this group of gifted children with the available norms from the general population. Secondly, we will evaluate the effects of the DWS program in all gifted children. Thirdly, we will evaluate the effects of the DWS program in gifted children with more social–emotional and academic problems beforehand (the at-risk children) and in parents with higher levels of parental stress beforehand (the at-risk parents). Outcome measures include: various aspects of self-concept (scholastic competence, social acceptance, athletic competence, physical appearance, behavioral conduct and global self-worth), enjoyment at the regular school, worry, sleep problems, somatic complaints, various aspects of social–emotional and behavioral functioning (conduct problems, inattention–hyperactivity, emotional symptoms, peer problems, prosocial behavior), academic achievement and parental stress.

The research questions of this study are: 1. Do gifted children experience more or less social–emotional problems compared to the general population, and do parents of gifted children experience more or less parental stress compared to the general population? 2. What are the effects of participation in the DWS on social–emotional and academic functioning in gifted children and on parental stress in their parents? 3. What are the effects of participation in the DWS on social–emotional and academic functioning in the gifted children at-risk for social–emotional and academic problems, and what are the effects of DWS on parental stress concerning the parents of gifted children at-risk for parental stress?

Method

Participants

Of the 102 children of 25 primary schools that joined the DWS, 93 children participated in the research. During the research, no children dropped out of the program. The participants consisted of gifted children in grades 3 till 5, 57 (61 %) boys and 36 (39 %) girls. The age of the children ranged from 8 till 11 with a mean of 9.51 (0.86). Four children (4 % of the total group; 2 girls and 2 boys) were not present at the day of the post-test and therefore did not fill in these questionnaires, resulting in a sample of 89 children. Furthermore, 72 mothers, 70 fathers and 20 teachers of these children participated in this study. The mothers were on average 44 years old (SD 4.6, range 33–53). The majority of the mothers, in total 61, were of Dutch origin (85 %), 11 mothers were of foreign origin (15 %). The average educational level of the mothers was 7.3 (1.09), from 1 = elementary school to 8 = university college. The fathers were on average 47 years old (SD 5.6, range 27–59). Most fathers were of Dutch origin (86 %), 9 fathers were of foreign origin (13 %). The average educational level of the fathers was 7.2 (1.20). Of the 69 teachers that were approached for the research, 20 filled in the pre- and posttest questionnaires of 26 children (which is 29 % of the participating children). The teachers that participated in the study consisted of 4 men (20 %) and 16 women (80 %). The teachers were on average 45 years old (SD 13.4, range 23–62). Most teachers were of Dutch origin (95 %), only 1 teacher was of foreign origin (5 %).

Procedure

The municipality of Amsterdam invited all school governing bodies of primary schools in Amsterdam for a meeting, in which the ABC, a Dutch educational service, presented the DWS concept. After the presentation, two school governing bodies decided to collaborate with the ABC and to give their schools the option of participating in the DWS program. To ensure that the sample of schools was representative of the schools in Amsterdam, the school governing bodies and the ABC decided to start the DWS program in three different areas of Amsterdam (North, Centre, South). These areas included both lower SES neighborhoods and higher SES neighborhoods. Before the start of the DWS, a third school governing body applied for the DWS program. The three school governing bodies gave all their schools in the three selected areas of Amsterdam the possibility of joining the DWS program. In the end, 25 primary schools with children in grades 3–5 participated.

As we also wanted to include underachievers in the DWS, a special identification procedure was used to select gifted children from a group of approximately 2,500 pupils. This did not necessarily include intelligence tests; except for general ability, other factors like creativity and how the children grasp, understand and deal with tasks were also considered. The identification procedure consisted of two phases. In the first phase, all children in a regular classroom performed several tasks that required ‘thinking out of the box’ and a final challenging task with increasing difficulty. An example of a task: ‘A bunch of frogs live in a water pool. The brown frogs live on one side of the pool and the green frogs on the other side. 1 day, they decide they want to change places and live on the other side of the pool. They decide to use the water lilies as springboards to reach the other side. How many jumps would a brown and a green frog have to make to change place?’. In the same assignment there were some rules as ‘only one frog can sit on one water lily’. The results of the tests were examined by a specialist in gifted education and by the person responsible for the quality management of the DWS, both working at the educational service ABC. The children who solved the task in the most excellent way, the most creative way or used impressive logical reasoning, were selected. In the second phase, the selected children performed various other tasks outside the regular class in a group with other selected children, during which the specialist in gifted education and the quality manager of the DWS observed them and again examined the results. The tasks consisted of verbal and written tasks. Aside from examining the children’s responses on the assignments, the children’s level of logical thinking, creativity and motivation were categorized from 1 (very low) to 5 (excellent). Furthermore, particulars were recorded, such as complex use of language or speed of thinking. Taking into account all these factors, the observer rated whether participating in the DWS would be appropriate for the observed child (yes/no/maybe). The results of the tasks were completed by information that was already available, like learning results, observations and previous (intelligence) tests before the definitive selection was made. Tutors in the school discussed with the specialist in gifted education and quality manager of the ABC which candidates could profit the most, resulting in a final selection. Successively, the parents of the selected children received an invitation for an information meeting. After the parents gave permission for their children to participate in the program, and children agreed with participation as well, the children started the DWS.

This study is an exploratory study that uses an uncontrolled open trial design. Children, parents and teachers (of the regular school) filled in questionnaires just before the start of the program and after 2.5 months (i.e. after 10–12 days of DWS). The children completed the questionnaires in the DWS class. The parents and teachers were asked to fill in the

questionnaires at home. The study was approved by the local ethics committee of the University of Amsterdam, and informed consent of parents and children was obtained.

Intervention Description

The DWS is a pullout enrichment program for gifted children. The program was developed by the British National Association for Able Children in Education (NACE) and started in England in 2007. The initiative to start the program in Amsterdam was taken in 2010 by the Dutch educational service ABC, in collaboration with three school governing bodies. During this study, there were six DWS classes given by five teachers and spread over four locations in Amsterdam. The DWS classes were positioned in regular primary schools. 1 day a week, from 08:30 to 15:15 (these hours are similar to those of the regular classes), the selected children went to the DWS class. In the remaining days, the children continued to go to their own regular classes. A DWS class consisted of approximately 16 pupils (which is about half the size of a regular school class) and one teacher.

The target of the DWS was challenging the children academically and thereby preventing demotivation for learning. The curriculum consisted of subjects like philosophy, mathematics, science, “learning to learn”, social competence, self-reflection and self-management. Activities consisted of, for example, scientific experiments, challenging team assignments (for example projects in which children advise the municipality about issues concerning the city, or building a marble coaster using only paper and glue), and discussing philosophical and political questions.

Day a Week School teachers were selected from a group of primary school teachers who had applied to teach in the DWS program. They had to prepare and give a lesson based on the DWS principles. The specialist in gifted education, the quality manager and the project leader of the Dutch DWS project evaluated these lessons and gave feedback to the teachers. Selection criteria were: content of the lesson, teaching methods, stimulation of quality thinking, organization of the lesson, teacher/pupil interaction and pupil/pupil interaction. The selected teachers followed a two-day training in DWS by the original developers of DWS, Carol Cummings and Aileen Hoare (Cummings and Hoare 2008). The teachers of the DWS developed the lessons themselves and discussed them during group intervention. The teachers prepared a program for the day, but were flexible to adapt the lessons to the interests of the children. Every week, the children received a challenging homework task such as solving a puzzle.

The teachers of the regular school of the child were informed about the DWS and how it could benefit gifted children. As outlined before, they were involved in the process of selecting children who could profit the most from the pullout program. It was essential that the teachers understood the importance of the program and the benefits that it could bring to the selected children. The teachers agreed that the children would miss 1 day a week of their own classes. They received a weekly handout of what the DWS class of their gifted students was about.

Measures

Self-concept

Self-concept was assessed by means of a Dutch version (Veerman et al. 1994) of Harter's (1985) self-perception profile for children (SPPC). The scale is intended for children

between the age of 8 and 12 years. The SPPC is divided into six scales. Five of the scales measure specific domains of self-concept: Scholastic Competence, Social Acceptance, Athletic Competence, Physical Appearance and Behavioral Conduct. The sixth scale represents Global Self-worth, which is a more general concept. Each scale consists of six items that are formulated as bipolar statements, for example, "Some kids feel that they are very good at their school work" but "Other kids worry about whether they can do the school work assigned to them". The child chooses which of the two statements applies to him or her, and then judges whether the chosen statement is "sort of true for me" or "really true for me". Dutch norms were obtained by Veerman et al. (1994), including 361 children. The internal consistency and test-retest reliability of all scales were considered reasonable to good (average Cronbach's alpha = 0.74; average test-retest Pearson correlation over a period of 4 weeks = 0.77). In the current study the Cronbach's alpha of the self-concept scales measured at pretest, ranged from 0.67 to 0.84.

Enjoyment at Regular School

Enjoyment at the regular school was measured using the scale Well-being at School of the Dutch School Questionnaire (Smits and Vorst 1990) for 9–16 year old children. The scale Well-being consists of three subscales: enjoyment at school, social acceptance and relationships with teachers. Only the subscale enjoyment at school was included, consisting of eight items. An example of an item is "I like to go to school". Children rated each item on a 3-points scale (0 = not true, 1 = do not know, 2 = true). Dutch norms are available (Smits and Vorst 1990), from a norm group consisting of 915 children. The Cronbach's alpha of the subscale can be considered reasonable to good (Smits et al. 2008). In the current study the Cronbach's alpha at pretest is 0.80.

Worry

The tendency to worry was measured with the Non Productive Thoughts Questionnaire for Children (Jellesma et al. 2005), filled in by the children. The questionnaire comprises ten items; an example of an item is "I often worry". Respondents are asked to rate the degree to which each item is true for them on a 3-point scale (1 = not true, 2 = sometimes true, 3 = often true). The scale has good internal consistency, with a Cronbach's alpha of 0.84 (Jellesma et al. 2005). In this study the Cronbach's alpha measured at pretest is 0.73.

Sleep Problems

The sleep problems of the children were measured with five items of the questionnaire Quality of Sleep (Meijer and Van den Wittenboer 2004), filled in by both parents and the child. Two examples of the items are "Do you sometimes wake up during the night?" and "Do you feel rested at awakening?". Respondents were asked to rate the degree to which each item applies to them on a 3-point scale (1 = never, 2 = sometimes, 3 = almost every night or 1 = no, 2 = sometimes, 3 = yes). The reported Cronbach's alpha of the total scale is 0.67 (Meijer and Van den Wittenboer 2004). In this study the Cronbach's alpha at pretest is 0.69 for the children, 0.59 for the mothers and 0.48 for the fathers. Due to the low reliability of the parent reports, we used only the child report of sleep problems.

Somatic Complaints

Somatic complaints of the children were measured with the Dutch version of the Somatic Complaint List (SCL, Jellesma et al. 2007), filled in by both parents and the child. This scale consists of 11 items. An example of an item is “I have a headache”. Respondents rated each item on a 5-point scale from 1 = (almost) never to 5 = quite often. This questionnaire has demonstrated good reliability ($\alpha > 0.75$, Rieffe et al. 2004). The Cronbach’s alpha of the scale was replicated in a Dutch sample (Rieffe et al. 2007). In this study the Cronbach’s alpha at pretest is 0.80 for the children, 0.83 for the mothers and 0.82 for the fathers.

Social–Emotional and Behavioral Problems

The teachers and the parents of the children filled in the Strengths and Difficulties Questionnaire (SDQ; Goodman 1997). This questionnaire is a brief behavioral screening questionnaire for teachers or parents of 4–16 year old children. The SDQ contains 25 items, divided between five scales of five items each, generating scores for: Conduct Problems, Inattention-Hyperactivity, Emotional Symptoms, Peer Problems and Prosocial Behavior. All scales but the last are summed to generate a Total Problems score. An example of an item is “Often unhappy, depressed or tearful”. Respondents are asked to rate the degree to which each item is true for the child on a 3-point scale (0 = not true, 1 = sometimes true, 2 = often true). This questionnaire has demonstrated excellent reliability and validity (Goodman 1997, 1999). Furthermore, although Dutch norms are not available, cutoff scores from the United Kingdom are available to distinguish between clinical, subclinical and non-clinical scores; Goodman and Scott (1999) found that the SDQ and the Child Behavior Checklist (CBCL) were equally able to differentiate children of psychiatric clinics from community samples. They reported large associations between the SDQ and independently diagnosed disorders, with mean odds ratios as high as 15 from both parent and teacher scales. In this study the Cronbach’s alpha at pretest of the Total Problems scale is 0.80 for the mothers, 0.78 for the fathers and 0.87 for the teachers. The Cronbach’s alpha of the subscales ranges from 0.56 to 0.83 for the mothers, from 0.51 to 0.75 for the fathers, and from 0.63 to 0.80 for the teachers.

Parental Stress

To measure parental stress the Dutch Nijmeegse Ouderlijke Stress Index (NOSI) is used, filled in by both parents. The NOSI is based on the American Parenting Stress Index (Abidin 1983), and translated and investigated by De Brock et al. (1992). In this study the 13-item subscale Competence will be used, measuring the extent to which the parent feels incompetent in rearing the child (Dekovic et al. 1996). An example of an item is “Rearing my child is more difficult than I expected”. Parents rated each item on a 6-point Likert scale, ranging from 1 = totally disagree to 6 = totally agree. Dutch norms are available (De Brock et al. 1992), with a norm group consisting of 161 mothers and 84 fathers. The Cronbach’s alpha of the scale is .86 (Dekovic et al. 1996). In this study the Cronbach’s alpha at pretest is 0.91 for the mothers and 0.84 for the fathers.

Academic Achievement

Teachers were asked to fill in the child's academic results of language, reading and mathematics. They could rate each subject on a 5-point scale, ranging from 1 = insufficient: very weak till weak (D-level) to 5 = good to very good (A-level).

Statistical Analyses

As the literature is ambivalent about the amount and nature of problems gifted children and their parents experience, we wanted to first get an impression of possible problems in gifted children and their parents. Therefore we compared the dependent variables at pretest to the norms that were available.

By means of paired samples *t*-tests, changes from pretest to posttest were analyzed. Effect sizes of change (Cohen's *d*) were calculated by the mean of the difference (post minus pre) divided by the SD of these differences (see Table 1). Effect sizes <.4 are considered small, .4–.8 medium and >.8 large.

Next, the total group was divided in two groups by means of a median split regarding the dependent variables at pretest. The groups with the more problematic scores at pretest (scores below the median) were labeled the at-risk groups. At-risk groups were created separately for the different respondents (child, father, mother, teacher) and for the different problem scales (see Table 1). Separate paired samples *t*-tests were conducted concerning the at-risk group. As statistical software SPSS Statistics 20 was used.

Results

Clinical/Non-Clinical Scores at Pretest

We compared the social–emotional problems of the gifted children in this study with the available norms from the general population. The norms that were available were the norms of the self-concept scales, enjoyment at school, social–emotional and behavioral problems, and of parental stress. First, the self-concept scales filled in by the children were compared to the available Dutch norms. In the general population, the lowest 15 % of the scores on the self-concept scales is called clinical. At pretest none of the children had clinical scores regarding scholastic competence, 14.0 % of the children had clinical scores on social acceptance, 20.9 % on athletic competence, 12.8 % on physical appearance, 5.8 % on behavioral conduct and 7.0 % on global self-worth. Furthermore, the pretest scores of enjoyment at school were compared to the Dutch norms. In the general population, the lowest 11 % of the scores on enjoyment at school is called clinical. At pretest 22.7 % of the children ranked themselves in the clinical range (extreme or strong negative attitude towards school) of enjoyment at school. Dutch norms of the social–emotional and behavioral problems in children were not available; to still get an indication about the extent of social–emotional and behavioral problems in gifted children these scores were compared with the norm scores from the United Kingdom. In the general population, the lowest 10 % of the scores on social–emotional and behavioral problems are clinical scores and the lowest 20 % of the scores are subclinical and clinical scores. Because the lowest 10 % is a rather small amount for a non-clinical group, in this study we decided to look at the subclinical and clinical scores together. At pretest, 20.3 % of the fathers reported

Table 1 Descriptive statistics and effects of the DWS on the total group

	Respondent	Pretest		Posttest		n	t value	Cohen's d
		M	SD	M	SD			
<i>Self-perception profile for children</i>								
Scholastic competence ^a	Child	3.33	0.47	3.42	0.44	86	2.46	0.27**
Social acceptance ^a	Child	2.98	0.65	3.11	1.08	86	1.25	0.13
Athletic competence ^a	Child	3.09	0.61	3.09	0.65	86	0.03	0.00
Physical appearance ^a	Child	3.36	0.55	3.36	0.58	86	0.04	0.00
Behavioral conduct ^a	Child	3.13	0.48	3.25	0.46	86	3.04	0.33**
Global self-worth ^a	Child	3.49	0.45	3.49	0.52	86	0.06	0.01
Enjoyment at school ^a	Child	2.63	0.38	2.64	0.41	88	0.19	0.02
Worry	Child	1.72	0.35	1.68	0.42	88	1.07	0.11
Sleep problems	Child	1.82	0.41	1.80	0.39	87	0.74	0.08
Somatic complaints	Child	1.73	0.54	1.71	0.61	89	0.42	0.04
	Mother	1.68	0.51	1.61	0.47	71	1.56	0.19
	Father	1.52	0.44	1.48	0.45	70	1.20	0.14
<i>Strengths and difficulties questionnaire</i>								
Conduct problems	Mother	0.24	0.29	0.26	0.33	72	0.81	0.10
	Father	0.27	0.28	0.29	0.31	69	0.95	0.10
	Teacher	0.11	0.17	0.12	0.17	26	0.25	0.05
Inattention-hyperactivity	Mother	0.53	0.56	0.56	0.58	72	0.82	0.12
	Father	0.52	0.49	0.55	0.52	69	1.00	0.11
	Teacher	0.40	0.49	0.36	0.45	26	0.68	0.13
Emotional symptoms	Mother	0.45	0.43	0.43	0.46	72	0.51	0.06
	Father	0.41	0.40	0.38	0.36	69	0.89	0.11
	Teacher	0.25	0.38	0.32	0.38	26	1.16	0.23
Peer problems	Mother	0.35	0.43	0.39	0.45	72	1.06	0.12
	Father	0.32	0.36	0.28	0.38	69	1.56	0.19
	Teacher	0.36	0.42	0.43	0.43	26	1.61	0.32
Prosocial behavior ^a	Mother	1.67	0.35	1.61	0.36	72	1.62	0.19
	Father	1.59	0.35	1.66	0.37	69	1.86	0.22*
	Teacher	1.52	0.45	1.42	0.49	26	1.57	0.31
Total problems	Mother	0.39	0.28	0.41	0.31	72	0.85	0.10
	Father	0.38	0.26	0.37	0.25	69	0.25	0.03
	Teacher	0.28	0.30	0.31	0.27	26	0.91	0.18
Parental stress	Mother	1.77	0.67	1.83	0.73	72	1.10	0.13
	Father	1.74	0.56	1.79	0.66	70	0.84	0.10
<i>Academic achievement</i>								
Language ^a	Teacher	4.65	0.56	4.81	0.49	26	1.69	0.33
Reading ^a	Teacher	4.88	0.33	4.92	0.27	26	0.57	0.11
Mathematics ^a	Teacher	4.85	0.37	4.88	0.33	26	1.00	0.19

* $p < .05$; ** $p < .01$; *** $p < .001$

^a To the mean scores on the SPPC (competences), on the School Questionnaire (enjoyment at school), on Prosocial Behavior of the SDQ, and on academic achievement (language, reading, mathematics) applies: the higher the score, the more positive the outcome. To the mean scores of the other questionnaires (consisting of problem scales) applies: the higher the score, the more negative the outcome

(sub)clinical scores regarding their child's emotional symptoms, 15.9 % regarding conduct problems, 15.9 % regarding inattention/hyperactivity, 26.1 % regarding peer problems, 11.6 % regarding prosocial behavior and 15.9 % regarding the total problems of the child. Furthermore, 23.6 % of the mothers reported (sub)clinical scores regarding their child's emotional symptoms, 18.1 % regarding conduct problems, 16.7 % regarding inattention/hyperactivity, 29.2 % regarding peer problems, 6.9 % regarding prosocial behavior and 13.9 % regarding the total problems of the child. Finally, 7.7 % of the teachers reported (sub)clinical scores regarding the child's emotional symptoms, 3.8 % regarding conduct problems, 15.4 % regarding inattention/hyperactivity, 19.2 % regarding peer problems, 23.1 % regarding prosocial problems and 19.2 % regarding total problems of the child. Finally, the pretest scores of parental stress were compared to the Dutch norms. In the general population, the lowest 15 % of the scores is called clinical. At pretest, 5.6 % of the mothers and 7.1 % of the fathers had clinical scores on parental stress.

Effects of DWS on the Total Group

Children reported small positive effects concerning the self-concept dimensions scholastic competence (synonymous with academic self-concept) and behavioral conduct from pretest to posttest. The children reported no significant improvements on the other self-concept dimensions: social acceptance, athletic competence, physical appearance and global self-worth. Furthermore, they reported no significant changes on enjoyment at regular school, on worry, sleep problems and somatic complaints. Mothers reported no significant changes concerning their children's somatic complaints, and no changes on social-emotional and behavioral problems. They also reported no reduced parenting stress. Fathers reported a significant positive effect in their children's prosocial behavior of small effect size. Fathers reported no significant changes on the other measures concerning their children and their own parenting stress. Teachers reported no significant changes in academic achievement, and in social-emotional and behavioral problems in the total group. The descriptives and effect sizes are reported in Table 1.

Effects of DWS on the At-Risk Group

Children of the at-risk groups reported a significant increase in the self-concept dimension scholastic competence and behavioral conduct of medium effect size. Furthermore, at-risk children reported a significant, small positive effect on enjoyment at school from pretest to posttest. Additionally, at-risk children reported a significant, medium positive effect on sleep problems and on worry. The at-risk children reported no significant changes on the other self-concept dimensions and on somatic complaints. Mothers reported significant reductions of small effect sizes concerning the at-risk children's somatic complaints, inattention/hyperactivity and emotional symptoms. Fathers reported significant reductions of small effect sizes concerning the at-risk children's somatic complaints, emotional symptoms and peer problems. Finally, teachers reported a significant reduction of medium effect size of the at-risk children's inattention/hyperactivity and a significant improvement of large effect size on their language results. The descriptives and effect sizes are reported in Table 2.

Table 2 Descriptive statistics and effects of the DWS on the at-risk group

	Respondent	Pretest		Posttest		n	t value	Cohen's d
		M	SD	M	SD			
<i>Self-perception profile for children</i>								
Scholastic competence ^a	Child	2.82	0.27	3.08	0.43	32	4.30	0.76***
Social acceptance ^a	Child	2.37	0.49	2.53	0.69	35	1.47	0.25
Athletic competence ^a	Child	2.69	0.51	2.72	0.63	48	0.56	0.08
Physical appearance ^a	Child	2.85	0.42	2.93	0.51	38	1.04	0.17
Behavioral conduct ^a	Child	2.82	0.31	3.02	0.38	52	4.21	0.58***
Global self-worth ^a	Child	3.10	0.35	3.16	0.51	41	0.82	0.13
<i>Enjoyment at school^a</i>	Child	2.30	0.38	2.45	0.44	37	2.34	0.38*
<i>Worry</i>	Child	2.06	0.24	1.87	0.38	37	2.77	0.46**
<i>Sleep problems</i>	Child	2.21	0.27	2.04	0.36	37	2.96	0.49**
<i>Somatic complaints</i>	Child	2.16	0.49	2.02	0.66	41	1.62	0.25
	Mother	1.99	0.43	1.84	0.44	43	2.24	0.34*
	Father	1.80	0.39	1.70	0.48	40	1.73	0.27*
<i>Strengths and difficulties questionnaire</i>								
Conduct problems	Mother	0.59	0.24	0.56	0.40	23	0.58	0.12
	Father	0.58	0.24	0.53	0.34	24	0.69	0.14
	Teacher	0.31	0.15	0.24	0.22	9	0.89	0.30
Inattention–hyperactivity	Mother	1.11	0.38	0.98	0.57	29	1.70	0.32*
	Father	1.04	0.33	0.99	0.52	27	0.60	0.12
	Teacher	0.85	0.43	0.67	0.50	11	2.19	0.66*
Emotional symptoms	Mother	0.93	0.33	0.77	0.52	26	1.88	0.37*
	Father	0.87	0.32	0.68	0.39	23	2.02	0.42*
	Teacher	0.80	0.33	0.80	0.40	7	0.00	0.00
Peer problems	Mother	0.82	0.34	0.76	0.45	27	0.80	0.15
	Father	0.67	0.32	0.54	0.45	28	1.90	0.36*
	Teacher	0.76	0.36	0.80	0.40	11	0.48	0.15
Prosocial behavior ^a	Mother	1.32	0.33	1.36	0.37	28	0.83	0.16
	Father	1.15	0.24	1.31	0.43	22	1.67	0.36
	Teacher	0.87	0.33	0.87	0.30	6	0.00	0.00
Total problems	Mother	0.62	0.22	0.61	0.28	35	0.30	0.05
	Father	0.60	0.20	0.54	0.25	33	1.55	0.27
	Teacher	0.55	0.28	0.53	0.27	11	0.41	0.12
Parental stress	Mother	2.45	0.57	2.49	0.73	35	0.38	0.06
	Father	2.32	0.39	2.32	0.63	35	0.03	0.00
<i>Academic achievement</i>								
Language ^a	Teacher	3.88	0.35	4.50	0.76	8	3.42	1.21**
Reading ^{a,b}	Teacher	4.00	0.00	4.67	0.58	3	2.00	1.16
Mathematics ^{a,b}	Teacher	4.00	0.00	4.25	0.50	4	1.00	0.05

* $p < .05$; ** $p < .01$; *** $p < .001$

^a To the mean scores on the SPPC (competences), on the School Questionnaire (enjoyment at school), on Prosocial Behavior of the SDQ, and on academic achievement (language, reading, mathematics) applies: the higher the score, the more positive the outcome. To the mean scores of the other questionnaires applies: the higher the score, the more negative the outcome

^b The at-risk groups of reading and mathematics in the category academic achievement are too small for paired *t*-test analyses. Therefore no conclusions can be drawn concerning these two variables

Discussion

Social–Emotional Problems in Gifted Children and Parental Stress in their Parents

Since there is ambiguity about the social–emotional problems gifted children experience, this study compared the social–emotional problems of the selected gifted children with the general population. Furthermore, we compared the parental stress levels of the parents of the gifted children with the general population.

Compared with the general population, fewer gifted children reported problems regarding their general self-concept, their academic self-concept and the way they behaved. The parents of the gifted children reported less often clinical scores in prosocial behavior and, this counts especially for the mothers, they reported less often clinical total problems, as compared to the general population. These findings are in line with research showing that gifted children as a group experience less social–emotional problems (see for example Neihart 2002).

However, parents reported *more* peer problems regarding their children in comparison with the general population, which is in line with the observation that gifted children encounter difficulties in friendships more often, as their interests may not match with those of their less gifted peers. Furthermore, gifted children reported to be somewhat less confident about their athletic competence. Note also that in this study a large group of the gifted children did report little enjoyment at school. In fact, compared with the general population, twice as many gifted children reported extreme or strong negative attitudes towards school. This is in line with former research, indicating that education may be not well adapted for gifted children (Archambault et al. 1993; Moon et al. 1995; Reis and Purcell 1993; Rogers 2002).

Parents of gifted children experienced less parental stress compared with the general population. One explanation of this finding is that the parental stress measure that we used is not sensitive to measuring the specific stress that parents of some gifted children experience. Another explanation is that parents of gifted children are on average more intelligent than parents from the general population because of heritability of IQ, and intelligence may be a protective factor against parental stress.

Effects of DWS on the Total Group

This study evaluated the effects of the DWS program for gifted and talented children on social–emotional and academic functioning. In a period of 2–3 months, several positive effects were found concerning the functioning of all gifted children who participated. The children reported higher scholastic competence (i.e. a higher academic self-concept) and improved behavioral conduct after the DWS. This indicates that the children felt more academically competent and that they were more satisfied about their own behavior (i.e. they thought they were behaving better). Interestingly, while full-time grouping of gifted children has been found to lead to a decline in academic self-concept (the so-called “big-fish–little-pond-effect”: it is better for academic self-concept to be a gifted learner in a regular reference group than in a gifted reference group; Marsh and Parker 1984), this study shows that a pullout program, in which children have a regular reference group as well as a gifted reference group, can actually enhance the academic self-concept of these children. Although the academic self-concept scores of the highly gifted children was not in the clinical range (the 15 % with the lowest academic self-concept), it can still be questioned whether the gifted children did not have a too low academic self-concept

considering their actual capacities. Gifted children, in fact, are generally more academically competent than the average child. Having the 2 % best IQ's (Krause et al. 2003) it could be expected that gifted children would rank themselves among the best learners. Surprisingly, a group of 38 % percent did not rank themselves in the highest 15 % on academic self-concept of the SPPC, indicating that a fairly large group of the children may have underestimated their real academic abilities. In line with former research, significant effects of DWS on *general* self-concept were not found (Vaughn et al. 1991).

Mothers did not report any significant changes after participation of their child in the program. Fathers only reported improvement on prosocial behavior in their children. Both fathers and mothers did not report a decrease of parental stress. This may be explained by the fact that the participating parents had already low parental stress levels beforehand compared to the Dutch norms (both fathers and mothers experienced less than half of the parental stress that was reported in the general population).

Teachers did not report any significant changes in the group as a whole on academic results, nor on social-emotional or behavioral problems. Since former research unanimously shows positive effects of pullout programs on academic achievement (Delcourt et al. 2007; Vaughn et al. 1991), it may seem surprising that these effects are not found in this study. However, at the beginning of the program, the learning results of most children were already high (the average was an A-score, which was already the maximum). Therefore, there was little space for improvement on academic achievement on the used standard measure (a so-called ceiling effect).

Effects of DWS on the At-Risk Group

Evaluating the at-risk group, as expected, more positive effects were found. The children of the at-risk group reported even larger positive effects on scholastic competence and behavioral conduct. Furthermore, they reported more enjoyment at their regular school, less sleep problems and less worry. Considering the norms of enjoyment at school, the clinical group of gifted children was more than double the size of the clinical group in the general population (22.7 % compared to 11.0 %). This indicates that the schools these gifted children were attending may not have been well adapted to their needs, an outcome in accordance with former research (Archambault et al. 1993; Osin and Lesgold 1996). This study shows that DWS can increase enjoyment at school for gifted children who beforehand dislike being in the regular school.

Mothers reported in the at-risk group a decrease of the child's somatic complaints, inattention/hyperactivity and emotional symptoms. Fathers reported a decrease in somatic complaints, emotional symptoms and peer problems of the child. The effect sizes of the significant improvements, reported by parents, were small but significant. Seeing the overlap in the parent's reports about the reductions in somatic complaints and emotional problems, the evidence for these positive effects seems the strongest. This is also in line with the children reporting less worry after participation in the DWS program. DWS may reduce internalizing problems in gifted children at-risk for these problems.

Parents did not report other significant changes concerning their children, nor concerning their own parenting stress. One explanation for the lack of effect of DWS on parental stress, even in parents with elevated stress levels, is that the parental stress experienced by some parents was not so much related to the school environment, but more to raising a gifted child in the home environment. As reported by Morawska and Sanders (2009), parents of gifted children often mention requiring support in aspects of parenting in the home setting (aside from help in fulfilling the child's educational needs). Another

explanation, as mentioned earlier, is that the parental stress measure that we used is not sensitive to measuring the specific stress that parents of some gifted children experience.

Teachers reported, in line with former research about academic effects of pullout programs (Delcourt et al. 2007; Vaughn et al. 1991), a substantial increase of the language results of the children, as well as a large, but not significant, effect on the reading results. Effects reported by teachers were more difficult to reach significance, because of the relatively small group of teachers participating in the study ($n = 20$ reporting about 26 children). Furthermore, teachers reported, corresponding with the reports of the mothers, a decrease in inattention/hyperactivity in the at-risk group. Interestingly, Webb et al. (2005) noted that gifted children might incorrectly be diagnosed with ADHD, because of their high level of activity and their low concentration and motivation for schoolwork due to lack of stimulation. The group that, in fact, demonstrated more ADHD symptoms beforehand (the at-risk group) showed fewer symptoms after participating in DWS. This study shows that recognizing these children as gifted and letting them participate in education adapted to their needs may reduce their inattention and hyperactivity symptoms.

Gender Differences

In the current sample more boys than girls were included and it is unclear whether this distribution is representative for the total population of gifted children. However, there is evidence that, although no large differences between general IQ is found in males and females, males have larger variances in intelligence test scores compared to females. This means that more males score in both the lowest and the highest categories when tested with intelligence tests (Hedges and Nowell 1995; Deary et al. 2003), supporting the idea that the prevalence of giftedness may be somewhat higher in the male population. Another explanation for the overrepresentation of boys in the current study is that the way of selection, partly based on behavior in a group format related to solving a task, favored boys, as boys may behave more assertive in group assignments.

Limitations and Directions for Future Research

Since the sample used in this study was drawn from a single pullout program, replication of this study across varying types of pullout programs is necessary before one can generalize from the results of this research. This study did not include a comparison group. A control group of gifted children who do not participate in this pullout program (but may or may not follow other forms of special education) would be useful when making claims regarding the effectiveness of pullout programs, as the comparison group may or may not experience similar changes, due to the effect of assessment, time, or other interventions alongside such as school or private counseling. Furthermore, this study only reported short-term effects; it would be interesting to know how the program affects the children in the long term, as children participate in the DWS for three full school years. Additionally, the informants (fathers, mothers, teachers, children) sometimes differed in the effects they reported. It is unknown which observations are most valid and little research has been done about the specific validity of gifted children's self-report. Given that gifted children tend to be perfectionistic, it is possible that they do not easily report improvement in their functioning. Also, this study is conducted in the Netherlands, so results cannot be generalized to countries with different school systems. Not many studies have compared gifted education and its effects (especially on social-emotional functioning) between different countries (except for studies about the BFLPE effect, the BFLPE effect is replicated in a number of

different countries). It is unclear whether a program like DWS would have similar effects in other countries, especially in non-Western countries. Finally, although the total child group was fairly large, the at-risk groups and the group of teachers as respondents were relatively small.

Ideally, future research should include larger groups of children, parents and teachers, and should investigate the short and long term effects of pullout programs comparing them with a control group. The comparison should preferably be made with a randomized control group of gifted children who receive “educational enrichment as usual”. In this way, it would be possible to draw more conclusions concerning the effects of the pullout programs. Future research should control other variables that could affect the outcomes, like participation in psychological counseling. Additionally, more cross-cultural and cross-country research should be conducted concerning education for gifted children and its effects. Research should, aside from measuring academic effects, especially include social–emotional measures, as little research has been done concerning this subject. In addition, more research should be done comparing pullout programs with other forms of special education for gifted children to identify what forms of education are most desirable for gifted children, taking into account both academic and social–emotional functioning of gifted children. Finally, more in-depth research is needed on the risks of gifted children to develop mental health disorders and to be faulty diagnosed with, for example, AD(H)D or autism-spectrum disorders, as well as on how programs such as DWS can prevent such disorders to develop.

Conclusion

The DWS program appears to be a promising pullout program for gifted children, being specifically adapted to their educational and social–emotional needs. The DWS program shows some positive effects on the functioning of all participating children, such as increasing the academic self-concept. The program seems to be valuable especially for children experiencing social–emotional problems or underachievement beforehand. In fact, after participating in the program, children show improved school results and a number of positive effects in different areas of social–emotional functioning. Although the importance of an adequate approach in the regular classroom should certainly be emphasized, the DWS pullout program could be an important and valuable addition to better meet the needs of the gifted children.

Conflict of interest None.

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