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Contents

General Introduction

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For children with disabilities a regular classroom can be a challenging environment. In order to function adequately and make optimal use of their learning abilities and potential, they generally require educational support specifically tailored to their needs. This specialized support can be offered in a variety of settings ranging in restrictiveness, i.e. from a regular classroom to placement in a special school. During the past decades, a considerable body of research has emerged in the field of special education focusing on topics such as the characteristics of children with disabilities in special education, the special educational services used by this population, and the potential benefits of special educational placement and services with regard to behavioral and academic progress and development.

However, despite this high research interest, several issues remain under explored when it comes to children with an emotional or behavioral disorder (EBD) as their primary disability. For one, there is a need for a better understanding of factors that determine the restrictiveness of special educational placement of this population. Also, relatively little is known about the behavioral and academic progress of children with EBD in special education, and the possible differential influence of educational setting on progress outcomes. Further, more insight in factors that relate to academic and behavioral functioning of this population in special education is needed (Scholte, 2008). Such information is important to extend knowledge of learning environments that best fit the special needs of children with EBD, and is relevant for improvement of interventions and pedagogical strategies that aim to support the cognitive and social-emotional development of these children.

Special Education from an International and National Perspective

The implementation of special education and the diversity of provisions available to children with special educational needs differ from country to country. Often special educational placement and services are part of a continuum increasing in restrictiveness, i.e. ranging from regular classrooms, resource rooms, separate classes in regular school buildings to special schools (Stephens & Lakin, 1995). Irrespective of how special education takes form, a key component of special educational policy in many countries is the movement towards inclusive education (Ainscow & César, 2006), which entails the ambition to educate as many children with disabilities in a regular classroom as possible. This striving originates from the concern that the rights of children with disabilities are contravened by segregating them from the curriculum and practices of regular education, and from typically developing peers (Lindsay, 2007). Another aspect that gave rise to this special education reform was the increasingly questioned idea that education for children with disabilities in segregated settings would be more effective than in regular education. To enforce their intentions of developing educational policies towards inclusive education, many countries – including the Netherlands – signed the Salamanca Statement (United

Nations Educational Scientific and Cultural Organization (UNESCO), 1994), which declares that all children, including children with disabilities, have the right to express their wishes with respect to education, and must have the opportunity to be educated in regular schools.

In view of the idea of inclusive education, professionals who make decisions about special educational services and placement have to consider the least restrictive environment (LRE) for a child with a disability. The LRE is the school environment where children with disabilities can be educated with typically developing peers of the same age to the maximum extent appropriate (McLeskey, Landers, Williamson, & Hoppey, 2012). It is suggested that full inclusion is the most ideal situation, which means that children are educated in a regular education classroom for the majority of the school day (Stephens & Lakin, 1995).

Special education in the Netherlands aimed at providing support and facilities for children with a wide range of disabilities in a variety of segregated settings with their own area of expertise for almost half a century. Eventually, this resulted in 15 different types of special schools for children with mild to severe special educational needs (Meijer, 1994). Under the international influence of reforming educational policy towards inclusive education, the segregation of students with disabilities from regular education became less and less desirable. Also, the number of children with disabilities in special education kept increasing, and possibilities for children with disabilities to integrate in society were worrisome, partly due to the stigmatizing effect of having received education in a special school (Stoutjesdijk, 2011). Therefore, in 1998, the 'Weer Samen Naar School' policy[1] was registered in the Primary Education Act arranging the support and integration of children with mild disabilities in regular education (Algemene Rekenkamer, 2005). Five years later, the Centers of Expertise Act was adopted promoting the inclusion of children with severe disabilities in regular schools by allowing parents to decide in consultation with teachers whether special educational support for their child will be provided in a special school or in a regular school (Ministerie van OCW [Ministry of Education], 2006). Furthermore, with this legislation, the structure of the Dutch special educational system changed, dividing it into four different clusters with their own area of expertise regarding teaching and caring for children with severe disabilities. Cluster 1 offers special education for the visually impaired (1 % of all children within special education), Cluster 2 for the hearing impaired and/or children with serious speech and language problems (14 %), Cluster 3 for children with cognitive and/or physical disabilities (41 %), and Cluster 4 for children with developmental, behavioral, and/or emotional disorders (44 %) (CBS, 2009). Although today Dutch parents have a choice to place their disabled child in a regular school setting, the number of children with severe disabilities in special schools still exceeds the number in regular schools (Stoutjesdijk, Lemstra, & Jongbloed, 2007). It can therefore be concluded

[1] A free translation of Weer Samen Naar School in English is Together to School Again.

that despite the measures taken by the Dutch government to stimulate the inclusion of children with special educational needs in regular education, the implementation of inclusive education is still in a rather premature state. Particularly when compared to countries such as the United States, Great Britain, and the Scandinavian countries, which are perceived as the instigators of this special educational reform, and where full inclusive education is common practice. In order to boost the inclusion of children with severe disabilities in regular education, a future policy by the name of 'Passend Onderwijs'[2] is prepared by the Dutch Government and expected to take effect in August, 2014. With this policy, regular schools are obligated to support and educate children with severe disabilities or to find an appropriate alternative in the least restrictive environment possible. Furthermore, the admission criteria are being rescinded, thereby increasing the focus on individual learning needs and potential instead of laying the emphasis on disorder labels and disabilities (Passend Onderwijs, 2013).

Effects of special educational settings

Beneficial aspects of inclusive education mentioned by advocates appear to relate primarily to the social dimension of being in the presence of, and interaction with, typically developing peers (Koster, Nakken, Pijl, & Van Houten, 2009). Examples of such positive effects are improved social and communicative functioning, strengthened self concept, but also increased generalizability of skills (Harris, Handleman, Kristoff, Bass, & Gordon, 1990; Hunt, Farron-Davis, Beckstead, Curtis, & Goetz, 1994). On the other hand, arguments put forward for more restrictive environments include the provision of intensive individual attention and specialized support, and a lower likelihood of social exclusion (Landrum, Tankersley, & Kauffman, 2003; Mesibov & Shea, 1996; Monchy, Pijl, & Zandberg, 2004).

Over the years, several studies have been conducted focusing on the effectiveness of inclusive education for children with disabilities on behavioral, social, and academic outcome measures, whether or not compared to typically developing peers or children with disabilities in special schools or special classrooms. In the next chapters of this thesis the findings of these particular studies will be discussed. Overall, the results of these studies show great variability regarding the developmental benefits experienced in different settings for different populations. Due to this, the positive effects of placement in an inclusive setting compared to placement in a more restrictive setting and vice versa remain unclear (Lindsay, 2007; Mesibov & Shea, 1996). Although the results of these previous studies are inconclusive, they do provide important insight into progress and development of children with disabilities in a special educational setting. However, most of these studies included children with mild academic disabilities. Studies focusing on outcomes of children with severe disabilities in special education are much less available, in particular studies aimed at children with specific emotional and behavioral disorders

[2] A free translation of Passend Onderwijs in English is Appropriate Education.

such as ADHD and ASD. Therefore, little is known of the behavioral and academic progress made by these populations and of differences in progress between children enrolled in a variety of special educational settings.

Children with Emotional and Behavioral Disorders in Special Education

As mentioned above, a disability category distinguished in Dutch special education is that of children with developmental, behavioral, or emotional disorders (Cluster 4). Internationally comparable categories are children with emotional and behavioral disorders (EBD) or children with serious emotional disturbance (SED) (Stephens & Lakin, 1995). In order to increase the correspondence with terminology used in international journals we maintained the term EBD consistently throughout the chapters of this thesis to refer to the Cluster 4 population. To be eligible for special education in the Netherlands, children have to meet specific criteria designed by the Dutch government. If they do, they are entitled to special educational support within the cluster that serves their specific disability. The Dutch admission criteria for Cluster 4 are as follows: (a) a developmental, behavioral, and/or emotional disorder according to the Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition, Text Revision (DSM-IV-TR; American Psychiatric Association (APA), 2000) accompanied by (b) serious impairments preventing attendance of regular education, deficiencies which (c) the continuum of regular educational care cannot handle without additional help. In addition, the defining characteristics of the diagnosed disorders including the impairments should not be limited to the school environment alone, but must also be present at home and/or during leisure activities (Ministerie van OCW [Ministry of Education], 2006).

These criteria suggest that the Cluster 4 disability category accommodates a considerably heterogeneous population of children with a variety of disorders, educational needs and abilities. National studies examining the Cluster 4 population and studies conducted internationally with EBD/SED populations indeed depict this variation (e.g. LCTI, 2007; Wagner, Kutash, Duchnowski, Epstein, & Sumi, 2005). However, despite its heterogeneity, there are several deficits that can be pointed out that are typical of this population. Study findings show that the majority of the children with EBD in special education display maladaptive and disruptive behaviors (Cartledge & Johnson, 1996; Lane, Barton-Arwood, Nelson, & Wehby, 2008). Also, their interpersonal social skills are found to be less developed than in typically developing peers or peers with other disabilities (Wagner, 2005), often resulting in inappropriate interaction with classmates and teachers (Downing, Simpson, & Miles, 1990). Additionally, task-related behaviors such as sustained attention and motivation are often impaired, and academic underachievement throughout the whole educational curriculum is frequently reported (Lane et al., 2008). Due to the variety of negative behavioral patterns that are characteristic of children with EBD they are considered to be a particularly challenging population to teach and support (Hallenbeck,

Kaufmann, & Lloyd, 1993; Kauffman & Landrum, 2009). Studies show that regular classroom teachers are least tolerant of the behavior and placement of children with EBD in their classrooms, compared to children with other disabilities (Cartledge & Johnson, 1996). When examining the distribution of children with EBD over the continuum of special education, it can be seen that these children are placed more often in more restrictive educational settings compared to children with other disabilities, such as intellectual or physical disabilities (De Greef & Van Rijswijk, 2006; Epstein, Nelson, Polsgrove, Coutinho, & Quinn, 1993; Stephens & Lakin, 1995). However, the reasons for this disproportional distribution are poorly understood (Kauffman, Lloyd, Hallahan, & Astuto, 1995).

In this thesis we focus on children with EBD in general, and Attention Deficit Hyperactivity Disorder (ADHD) and Autism Spectrum Disorders (ASD) in particular. ADHD and ASD are among the most common childhood developmental disorders (Bush, 2010; Fombonne, 2009), and the most frequently encountered disorders in children in special education in the Netherlands (LCTI, 2007).

Autism Spectrum Disorders

Autism Spectrum Disorder (ASD) corresponds to pervasive developmental disorder (PDD) as described in the DSM-IV-TR (APA, 2000), representing a broader spectrum of distinct disorders with similar characteristics, namely autistic disorder, Asperger syndrome, Pervasive Developmental Disorder Not Otherwise Specified, and Childhood Disintegrative Disorder. Current estimates of prevalence for ASD are approximately 1 %, with males being diagnosed four times more often than females (Fombonne, 2003; 2009; Gezondheidsraad, 2009).

Characteristic impairments of ASD are pervasive qualitative impairments in the area of social skills and communication, and restricted and stereotyped patterns of behavior and interests (American Psychiatric Association (APA), 2000). Applying traditional teaching methods in a regular classroom that includes children with ASD can be a challenging task. For example, the group-wise verbal instructions and explanations used in regular settings are often ineffective means to communicate because of the communication and language difficulties experienced by children with ASD. Furthermore, various academic difficulties are observed in children with ASD such as having trouble transitioning between tasks and organizing tasks, and difficulties with written expression and abstract reasoning (e.g. Church, Alisanski, & Amanullah, 2000; Harrower & Dunlap, 2001). In addition attention problems reflected in inattentive and hyperactive symptoms were found to be very common among children with ASD (Ashburner, Ziviani, & Rodger, 2010). Apart from these academic challenges, classroom problem behavior originating from difficulties with emotion regulation, such as frustration, stubbornness, and temper tantrums, was frequently reported (Lecavalier, 2006).

Attention Deficit Hyperactivity Disorder

According to the criteria of the DSM-IV-TR (APA, 2000), Attention Deficit Hyperactivity Disorder (ADHD) is characterized by problems such as excessive motor activity, inability to sustain attention, difficulty in taking turns, and interrupting others due to impulsivity. These problems should persist over six months and cause significant impairments of daily functioning in multiple settings such as home and school. Three subtypes of ADHD are distinguished: predominantly inattentive type, predominantly hyperactive-impulsive type, and combined type (APA, 2000). Approximately 8 % of the school-age children are diagnosed with ADHD (Centers for Disease Control and Prevention (CDC), 2012; Skounti, Philalithis, & Galanakis, 2007). Furthermore, ADHD is three times more common in males than in females (Gunning, 2007).

The disorder characteristic symptoms are particularly present in situations where skills related to executive functioning are strongly required (Barkley, 2006). It is therefore not surprising that a classroom can be a challenging environment for children diagnosed with ADHD. Academic underachievement is very common within this population, regardless of cognitive abilities (Barry, Lyman, & Klinger, 2002), and is found to persist into adolescence resulting in negative academic prospects across the lifespan (Daley & Birchwood, 2010; Ek, Westerlund, Holmberg, & Fernell, 2010). Additionally, symptoms of opposition, defiance, and aggression are often associated with ADHD (LeFever, Villers, Morrow, & Vaughan, 2002; Owens et al., 2005), just as difficulties in social interaction with classmates and teachers (Batzle, Weyandt, Janusis, & Deviett, 2010; Hinshaw, 2002; McConaughy, Volpe, Antshel, Gordon, & Eiraldi, 2011).

Family Functioning in Relation to Problem Behavior

Nowadays, it is widely acknowledged that the development and severity of problem behavior is the result of the interplay between child characteristics and environmental influences (Bronfenbrenner, 1986; 2005). For school-age children the nuclear family is one of the principal environments in which development takes place. Study findings consistently show that, apart from child temperament and academic underachievement, family risk factors are most strongly associated with the onset and persistence of behavioral problems (e.g., Herrenkohl, Herrenkohl, Rupert, Egolf, & Lutz, 1995; Nelson, Stage, Duppong-Hurley, Synhorst, & Epstein, 2007; Patterson, DeBaryshe, & Ramsey, 1989). Several aspects of poor family functioning are reported that have a strong negative impact on children's social-emotional development and thereby increasing the risk of emotional and behavioral problems (Scholte & Van der Ploeg, 2013), namely poor parental responsiveness to a child's needs (Stormshak, Bierman, McMahon, & Lengua, 2000), negative parent-child communication (Burke, Loeber, Lahey, & Rathouz, 2005), inadequate family organization (Griffin, Botvin, Scheier, Diaz, & Miller, 2000), a lack of a social network

providing family support (Vance, Bowen, Fernandez, & Thompson, 2002), and a disturbed relationship between parents (Gilman, Buka, Kawachi, & Fitzmaurice, 2003).

According to Bronfenbrenner's ecological model (1986) the environments in which a child's development takes place are mutual dependent resulting in the transfer of learned behaviors from one context to another, for example from home to school. A manner by which such a transfer might occur is through coercive interactions (Patterson, 2002). Negative interaction between children and caregivers can reinforce maladaptive behavioral responses. Such coercive interactions can be generalized to a classroom setting with teachers and peers, in which the maladaptive behaviors may escalate to more severe disruptive behavioral problems, especially when there are classmates with behavioral problems (Kellam, Ling, Merisca, Brown, & Ialongo, 1998; Patterson, 2002).

With regard to children with EBD receiving special educational support, research results indicate that they are significantly more likely to live in poorer functioning families with several risk factors associated with the development of problem behavior than children with other disabilities or typically developing children (Wagner et al., 2005). Reasoning from the ecological model and the coercive interaction theory we may hypothesize that adverse family circumstances or poor family functioning might contribute to the severity and continuity of problem behavior displayed by children with EBD in the classroom. If such a mechanism indeed is present, it would counteract the support provided to these children by the special educators during the daytime at school, and diminish the effectiveness of the special educational interventions. However, as far as we know, studies examining the relation between family functioning and classroom problem behavior for children with EBD in special education are virtually unavailable. Therefore, the impact of family functioning on classroom problem behavior could not be determined for this specific population so far.

Objectives and Overview of this Thesis

Considering that our understanding of several relevant topics concerning children with EBD in special education remains relatively limited, the main objectives of this thesis are (1) to shed light on factors that predict the level of restrictiveness of special educational placement of children with EBD, (2) to gain insight into factors that relate to progress and influence classroom problem behavior of children with EBD, and (3) to broaden our understanding of learning environments that are beneficial for children with high-functioning ASD (HFASD) and children with ADHD. Such information might be considered in procedures of decision making about special educational placement in the least restrictive environment and could serve as input for the improvement of special educational intervention strategies.

The results described in the different chapters of this thesis are based on a research sample of children with EBD in an urban area of the Netherlands receiving special

educational support (Cluster 4) in either special schools or regular schools. Each chapter is based on a manuscript that can be read separately. A degree of overlap between the chapters is therefore inevitable.

Chapter 2 describes a study in which predictors of placement in special educational settings varying in restrictiveness were examined. For this purpose, characteristics of children with EBD placed in either a special school or a regular school with special support were compared on several parameters such as problem behavior, academic performance, and family functioning. Subsequently, it was examined which of these characteristics were the strongest predictors of placement in a more restrictive educational setting.

Chapters 3 and 4 report findings of a one-year follow-up study that focused on a differential influence of special educational setting on progress outcomes of children diagnosed with ADHD and ASD, respectively. Outcome measures include disorder-specific symptoms, general problem behavior, and academic achievement. In addition, differences between settings regarding the use of pedagogical strategies in the daily classroom support were explored, as was the contribution of these strategies to positive outcomes.

In chapter 5 the influence of poor family functioning on classroom problem behavior of children with EBD receiving special educational support is examined. Analyses were performed for externalizing, internalizing, and total problem behavior separately.

Finally, in chapter 6, the findings reported in the previous chapters are integrated and discussed, and implications for future research and practice are presented.

Special Needs Characteristics of Children with Emotional and Behavioral Disorders that Affect Inclusion in Regular Education

2

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Abstract

The aim of this study was to determine the discriminating special needs characteristics of children with emotional and behavioral disorders (EBD) that predict restrictiveness of placement in special education. The focus was on dynamic factors instead of static factors. To this end, 235 children with EBD in special schools and 111 children with EBD in regular education were compared in terms of behavioral, emotional, academic, and environmental variables. Measurements used were the Child Behavior Checklist and Teachers' Report Form, information in the children's assessment reports, and the Family Questionnaire. In a logistic regression analysis eight variables were found to be relevant predictors for placement in special schools instead of regular education. Relational problems between child and caregiver, academic performance, and the age at which the child received youth care for the first time were identified as the three predictors that could most affect the inclusion of children with EBD in regular education. Implications of these findings for future research and practice are discussed.

Introduction

Children with emotional and behavioral disorders (EBD) like autism spectrum disorders, attention deficit hyperactivity disorders, and conduct disorders experience difficulties in numerous developmental areas, such as social adaptation and academic achievement (Landrum & Singh, 1995; Panacek & Dunlap, 2003; Reid, Gonzalez, Nordness, Trout, & Epstein, 2004; Wagner, Kutash, Duchnowski, Epstein, & Sumi, 2005; Williams-White, Scahill, Klin, Koenig, & Volkmar, 2006).

Because of these many difficulties, in Western societies children with EBD are generally placed in facilities for special education tailored to their needs. Although the structure of special education differs from country to country, these facilities usually cover a continuum ranging from standard education in a regular classroom to education in combination with residential treatment. In general, the educational policies of most countries are aimed at placing children with disabilities in the least restrictive environment (Lindsay, 2007). The aim to place as many children with disabilities as possible into mainstream education is registered in the Salamanca Statement (UNESCO, 1994) which declares that all children, including children with disabilities, must have the opportunity to be educated in regular schools. In other words, regular educational facilities must be 'schools for all'. The statement is based on children's rights and the concern that these rights are contravened by segregating children with disabilities from the mainstream educational curriculum and practices (Lindsay, 2007). Several countries support the ideology of the Salamanca Statement and therefore made or continued to make considerable efforts to adapt their educational policies, in order to contribute to the aim of inclusion. In Great Britain, for example, the Special Educational Needs and Disability Act was introduced (2001), in the Netherlands the Expertise Centers Act (2003), and in the United States the Individuals with Disabilities Education Act (1997).

Research on the distribution of children with disabilities over the continuum of special education demonstrates that children with EBD are usually placed in educational settings of a more restrictive type (Cullinan, Epstein, & Sabornie, 1992; De Greef & Van Rijswijk, 2006; Denny, Gunter, Shores, & Campbell, 1995; Stoutjesdijk & Scholte, 2009), also because EBD is considered the most challenging group of disabilities to be handled in regular education (regardless of whether additional support is available) (Hallenbeck, Kaufmann, & Lloyd, 1993; Kauffman & Landrum, 2009). A similar picture emerges when a comparison is made between children with EBD and children with other forms of disabilities, such as physical handicaps or learning disabilities, in special education; children with EBD are more often placed in segregated classrooms or separated facilities (De Greef & Van Rijswijk, 2006; Epstein et al., 1993; Stephens & Lakin, 1995). Given the considerable efforts on the part of governments to offer children with disabilities the opportunity to be educated in regular schools, the question arises why the inclusion of children with

emotional and behavioral disorders in these school settings is relatively limited. This is an important matter to address not only in the light of children's abilities and educational rights, but also considering the findings that some children with EBD are being placed in more restrictive settings than strictly necessary (Epstein & Cullinan, 1994; Hallenbeck et al., 1993). Furthermore, once a placement decision has been made, few of these children change their educational setting (Buysse & Bailey, 1994). When more is known about the special educational needs of children with EBD that affect inclusion in regular education, interventions can be aimed at these components so that more children with EBD can attend regular schools.

In order to answer the question stated above, it is important to determine the variables that contribute to the differences in levels of restrictiveness of children's placements. This means that research investigating the variables that actually predict these differences is needed. Previous studies on predictors of placement of children with EBD in facilities for special educational care has suggested that demographic variables such as low socio-economic status (SES) (La Paro, Olsen, & Pianta, 2002; Westendorp, Brink, Roberson, & Ortiz, 1986), ethnicity (Cohen et al., 1990; Westendorp et al., 1986), young age (Robertson et al., 1998), male gender (Westendorp et al., 1986), and low IQ (Kauffman, Cullinan, & Epstein, 1987) all contribute to the prediction of educational placement at a more restrictive level, together with variables that indicate stress in family functioning, such as maternal depression (Robertson et al., 1998; Westendorp et al., 1986), parental marital history (Westendorp et al., 1986), child maltreatment (Jonson-Reid, Drake, Kim, Porterfield, & Han, 2004), and quality of home environment (La Paro, Olsen, & Pianta, 2002). An interesting and rather surprising factor is that in most of these earlier studies static variables such as gender, age, and ethnicity were the most prominent predictors of educational placement setting, whereas dynamic variables such as behavioral, psychological, and academic measures had no or little effect although these are the main factors indicating students' (educational) needs (Kauffman et al., 1987; Robertson et al., 1998). This means that, despite previous research, there is still a lack of understanding which dynamic variables determine differences in educational placement. Such variables are important to identify, because unlike static variables, they can be used for intervention purposes. With this in mind, the goal of the present study is to determine the dynamic variables that can predict educational placement, so that interventions in regular schools can be aimed more directly at these special educational needs in order to increase possibilities to provide 'need-tailored' education for children with EBD. In contrast with existing research, the most obvious static variables age, gender, and ethnicity which tend to suppress the importance of dynamic variables in the prediction of placement setting, have therefore been controlled for in this study.

This study also includes academic performance (a variable that is a major indicator of students' educational needs), and family functioning has been examined more

thoroughly. This in response to research findings by Westendorp et al. (1986) and Buysse and Bailey (1994), who still found gaps in the knowledgebase concerning factors that contribute to the prediction of placement and indicated that future research should examine the pieces missing from the puzzle by including family characteristics and academic functioning as well. To date only few studies have been conducted which used this as a starting point, and included children with EBD who receive inclusive education in regular classrooms beside children who go to more restrictive facilities.

Furthermore, in previous research the decisions about both eligibility and assignment to a specific form of special education were made by the same authorities. In the study described here, the placement process was conducted in the Netherlands and consists of two parts according to the current statutory regulations. In the first step, an independent committee decides if a child is eligible for special education. If so, in the second step parents decide in consultation with the child's (future) educators whether the child will be placed in an inclusive setting or in a special school. This way the procedure not only guarantees that people who are most aware of the child's behavioral and educational needs are involved in the process of placement decision, but it also ensures that what is measured are not factors that relate to formal decisions on special education eligibility, but only factors related to placement.

With regard to the aim of this study two research questions were formulated: (1) What are the differences and similarities between the characteristics of children with EBD in inclusive settings and children with EBD in special schools in the Netherlands? And (2) which of these differences contribute most to the prediction of the level of restrictiveness of educational placement in the Netherlands?

Method

Procedure

The educational system in the Netherlands includes regular and special education. Since 1998, special education consists of four different clusters with their own area of expertise regarding teaching and caring for children with disabilities. Cluster 1 offers special education for the visually impaired (1 % of all children within special education), Cluster 2 for the hearing impaired and/or children with serious speech and language problems (14 %), Cluster 3 for children with cognitive and/or physical disabilities (41 %), and Cluster 4 for children with emotional and behavioral disorders (EBD) (44 %) (CBS, 2009). To be eligible for special education, children have to meet cluster specific criteria designed by the Dutch government. If so, children are entitled to receive a form of special education within the cluster that supports their disability. Whether this special educational care is provided within a separate facility or within a regular school with additional support (inclusive setting) is decided in concordance by parents and teachers. Although parents in the

Netherlands have a choice to place their disabled child in a regular school setting, the number of children with disabilities in special schools still exceeds the number in regular schools (Stoutjesdijk, Lemstra, & Jongbloed, 2007). So it can be concluded that the movement towards inclusive education for all children with disabilities in the Netherlands is still in a rather premature state compared to some other countries.

380 parents of 4- to 12-year old children who receive special educational support within Cluster 4 were requested to participate in the study by filling in questionnaires which could be returned to Leiden University. For the selection of parents, a random sample was taken of seven out of sixteen special schools and of two out of four educational services providing for special educational care in regular schools. Special schools connected to residential facilities were left out. Parental consent was obtained with regard to providing information about their children by the school and by teachers, who were also asked to fill in some questionnaires. Eventually, questionnaires were filled in by parents and teachers for 346 children.

Apart from questionnaires, data was also obtained by examining information in assessment reports of the children with help of an inventory list. This list was used to collect demographic features of the children in the sample, like age, sex, and living conditions, but also to record the presence of relevant child and family risk factors. Students of Leiden University gathered this information as part of their master thesis in Education and Child Studies. Before they set to work on the data collection, they received detailed instructions on how to list, define, and interpret the concepts in the inventory list and the information in the reports.

Participants

The sample of the present study consists of 346 children with EBD who grew up in an urban part of the Netherlands. They all met the criteria of cluster 4 special education, which are as follows: (a) a developmental, behavioral, and/or emotional disorder according to the Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition, Text Revision (DSM-IV-TR; American Psychiatric Association (APA), 2000) accompanied by (b) serious impairments to attain regular education which (c) the continuum of regular educational care can not provide for without additional services (Ministerie van OCW [Ministery of Education], 2006). Examples of serious impairments are relational problems with classmates and/or teachers, to be a danger to others and/or oneself, and severe motivational and attention problems. Two groups were studied: one group of 235 children (M_{age} of 9.8 years, SD=1.98) placed in separated facilities for special education (*Special School*) and one group of 111 children (M_{age} of 10.4 years, SD=1.79) who receive special education in regular classrooms for most of the school day (*Inclusive Education*). The mean age of both groups did not differ significantly ($p > .05$). The distribution of boys and girls in both groups is approximately similar (respectively 88 % and 12 % for the Special School

group, and 89 % and 11 % for the Inclusive Education group). Around 85 % of the children in both samples had a Caucasian ethnic background. Regarding the level of support services in both groups, there were no differences in program factors. The special schools and regular schools did not provide for additional treatment like family support or residential care, and only focused on care related to educational disabilities. In special schools this care was provided by specialized teachers and teacher aides (paraprofessionals). The teachers in regular schools were trained and coached by professionals from special educational services. Also, students with EBD in regular classrooms received support from learning support teachers (either visiting or based at the school).

Measures

To determine the factors that could contribute to the prediction of educational placement of children with EBD, studies on the relationship between risk factors and the development of problem behavior were examined. The results showed that temperament, family risk factors, academic performance, and SES were mostly associated with behavioral problems (Eckenrode, Rowe, Laird, & Brathwaite, 1995; Herrenkohl, Herrenkohl, Rupert, Egolf, & Lutz, 1995; Nelson, Stage, Duppong-Hurley, Synhorst, & Epstein 2007; Papp, Cummings, & Schermerhorn, 2004; Rae-Grant, Thomas, Offord, & Boyle, 1989). Nowadays, the main consensus is that emotional and behavioral problems in children are not caused by single risk factors, but are the result of interactions between characteristics of the child and risk and protective factors in the child's environment, such as family factors, school, and leisure activities. To be able to systematically investigate the variety of risk factors, so-called 'multiple-risk models' were introduced (Bronfenbrenner & Morris, 2006; Greenberg, Lengua, Coie, & Pinderhughes, 1999; Scholte, 1998). In the present study this multiple-risk model approach was also used to structure the multitude of factors that could contribute to the prediction of educational placement of children with EBD. Together with the results of the before mentioned studies on placement predictors, this gives good suggestions of variables that should be taken into account when examining placement issues of children with EBD, namely child factors (problem behavior and cognitive functioning), child and family risk factors (including the number of years of education of the caretakers and out-of-home care), and family functioning.

Problem behavior. The Dutch versions of the Child Behavior Checklist (CBCL; Verhulst, Van der Ende, & Koot, 1998) and the Teachers' Report Form (TRF; Verhulst, Van der Ende, & Koot, 1997) were used to obtain problem behaviors assessed by respectively the child's caregiver and the child's teacher. Both instruments provide a total scale score (Total Problems), two broad band scale scores (Internalizing Problems and Externalizing Problems) and six narrow band subscale scores (Affective Problems, Somatic Problems,

Attention Deficit/ Hyperactivity Problems, Oppositional Defiant Problems, and Conduct Problems). Parents and teachers can rate behavioral and emotional problems by answering 118 questions with a response set (0 = *not true*, 1 = *sometimes true*, 2 = *very true*). From both instruments the summary scale *t* scores of Internalizing Problems and Externalizing Problems were used in this study. With regard to the Dutch version of the CBCL and TRF, satisfactory psychometric characteristics for these two subscales were reported (Cronbach's alpha (α) > 0.87, test-retest reliability (*r*) > .81) (Verhulst, Van der Ende, & Koot, 1997).

Cognitive functioning. In this study, the concept cognitive functioning contains academic performance and IQ. Academic performance over the previous six months in comparison with peers is represented by a four-point scale (1 = *weak* (more than 10 months behind), 2 = *below average* (between 5 and 10 months behind), 3 = *average* (no arrears), and 4 = *above average* (more than 1 month ahead). This classification is based on a method recommended by the Dutch government to assess educational progress annually. The assessment battery consists of tests for reading, spelling, and math and gives an indication of the performance level of students in terms of months of education compared to a norm group of peers. The tests all meet the psychometric requirements of tests for diagnostic purposes with a Cronbach's alpha of 0.83 or higher for the subscales on reading, 0.86 or higher for the subscales on math, and 0.87 or higher for the subscales on spelling (CITO [Central Institute for Test Development], 2009). The variable academic performance is derived from averaging the outcomes on the tests for reading, math, and spelling. IQ scores were obtained from the assessment reports in which the Wechsler Intelligence Scale for Children -Revised (WISC-R; Van Haasen et al., 1986) was used to measure intelligence.

Child and family risk factors. The data concerning the risk factors were obtained through examining the assessment reports of the children. These assessment reports were composed by school psychologists and used by a commission to determine the need for special education for the children in this study. They therefore contain extensive information about the functioning of the children and their families. A total of eight risk factors were subtracted from the information found in the files of the children. Psychiatric problems of parents, psychiatric problems of siblings, child maltreatment, sense of parenting incompetence, relational problems between child and caregiver, and out-of-home care were coded in a binary fashion as absent or present. The first five of these risk factors were indicated as present if the assessment reports contained information of mental health services, child services or social services that explicitly mentioned these factors. Out-of-home care was indicated as present if reports about the child mentioned placement in residential treatment, foster care, and/or under supervision of a guardian.

Also, the continuous variable age at which the child came in contact with youth care for the first time was obtained from the reports. Contact with youth care is defined as any request for care or referral that is followed upon. Last, the continuous variable Years of Education was assessed by calculating the highest number of years of education of the caregivers in the house-hold.

Family functioning. To gain insight into family functioning the Family Questionnaire was used (Van der Ploeg & Scholte, 2008), an instrument comparable to the Family Environment Scale of Moose and Moose (1981). Family functioning is measured by five subscales, namely *Organization* (the strictness of rules that regulate the family interaction), *Communication* (the extent to which caregivers communicate in an open and harmonious way with their children), *Partner Relationship* (the quality of the relationship between caregivers), *Responsiveness* (the extent to which caregivers have an eye for the (developmental) needs of their children), and *Social Support* (the perceived amount of support from persons outside the family). Each subscale comprises nine items. These five subscales together constitute one overall scale measuring Total Family Functioning. Respondents can mark each item on a five-point scale (1 = *strongly disagree,* 2 = *disagree*, 3 = *neutral*, 4 = *agree*, and 5 = *strongly agree*). The internal consistency of the subscales is measured with Cronbach's alpha and was found to be between 0.83 and 0.97. The test-retest reliability was measured by computing interclass correlations between the first and second measure and resulted in coefficients above 0.75 for all subscales. This indicates that the psychometric properties of the instrument all meet the validity and reliability requirements set out for instruments serving diagnostic purposes (Evers, Van Vliet-Mulder, & Groot, 2000; Myers & Winters, 2002). The raw scores on the subscales were used in the analyses to represent the five continuous variables measuring family functioning.

Data Analysis

To conduct the statistical analyses, SPSS (Statistical Package for Social Sciences) 17 was used. The analysis of the data consists of two parts. First, independent sample *t*-tests were performed between the groups *Inclusive Education* and *Special School* on the before mentioned variables on the domains of the multiple-risk model to examine the differences and similarities between children with EBD in both groups. Effect sizes were calculated for all significant findings. For this purpose standardized mean differences (*d*) were used, where an effect size of .20 is considered small, .50 medium, and .80 large (Cohen, 1992).

Second, two logistic regression analysis procedures were performed to determine the most reliable and robust prediction of educational placement for children with EBD. Based on the theoretical background on which the variables in this study were selected and the aim of the study, initial logistic regression analyses were done for all variables within a domain of the multiple-risk model, in order to identify the most salient set of

domains and represented variables to include in the final regression model (Hilbe, 2009; Hosmer & Lemeshow, 1989; Nelson et al., 2007). This way the most parsimonious model to explain the data can be found considering the sample size and the relatively large number of variables, while model overfitting and production of numerically unstable estimates is avoided (Hosmer & Lemeshow (1989).

In order to be considered for the final analysis, an omnibus χ^2 statistic needed to be significant ($p < .05$) for each domain. Subsequently, only individual factors within each domain that were statistically predictive ($p < .05$) for educational placement according to the Wald statistic, were included in the final logistic regression model to identify the variables that most accurately predict educational placement setting.

Prior to the analyses, all relevant variables were inspected for outliers. Univariate outliers were investigated by boxplots and were defined as scores that differed from the median by two standard deviations or more (Field, 2005). Multivariate outliers were examined using the Mahalanobis distance with $p < 0.001$ (Tabachnik & Fidell, 1996). Two cases were identified as both a univariate and a multivariate outlier and were deleted. In addition, the variables were screened for singularity and multicollinearity. Singularity was examined by calculating Pearson correlations. The correlation matrix showed that none of the variables were highly correlated ($r > 0.90$) (Tabachnik & Fidell, 1996). Next, the collinearity statistics were evaluated. For all variables, the Variance Inflation Factor (VIF) was lower than 10 and the Tolerance was above 0.1. Both statistics indicate no cause for concern (Field, 2005; Stevens, 2002).

Results

Differences and Similarities in Characteristics

The results of the independent sample *t*-test between the two groups of children for the variables indicating problem behavior, cognitive functioning, child and family risk factors, and family functioning are presented together in Table 1.

Significant differences between groups were found on almost all variables within the four domains to the prejudice of children in special schools. Children in special schools receive significantly higher scores on the problem scales TRF-internalizing, TRF-externalizing, and CBCL-internalizing than children in inclusive education. Furthermore, children in special schools have significant lower IQ's and perform less well on academic tasks in comparison to their peers, than children in inclusive education.

The results on the domains concerning child and family risk factors and family functioning show a similar picture. Children in special schools were significantly younger when they first received youth care than children in inclusive education. Also, they experienced childhood maltreatment, out-of-home care, and relational problems with their caregivers more often than children in inclusive education. A sense of parenting

incompetence was more frequently reported within families of children in special schools than within families of children in inclusive education, and the number of years of education was significantly lower for families of children in special schools. Regarding the family functioning data it was found that families of children in special schools had significantly higher scores on all subscales measuring family functioning. This indicates that parents of children in special schools report more difficulties with regard to responsiveness, communication, organization, social network, and partner relationship than parents of children in inclusive education. No differences between groups were found according to parents' ratings on internalizing behavior and the occurrence of psychiatric problems of parents and siblings.

Determining Predictors

In order to determine statistically significant predictors of educational placement, initial logistic regression analyses were performed. In the following part the results of these analyses will be examined for each domain separately.

Problem behavior. Initial logistic regression analysis of the behavioral factors showed a statistically significant omnibus χ^2 for the problem behavior domain as a whole (χ^2 (4) = 48.61, $p < .01$). Of the four variables entered into the equation, TRF-externalizing (*B* = .04, *SE* = .01, Wald = 10.87, *p* = .001), TRF-internalizing (*B* = .04, *SE* = .01, Wald = 13.88, *p* = .000), and CBCL-externalizing (*B* = .03, *SE* = .01, Wald = 8.25, *p* = .004) turned out to be significant predictors of educational placement within the problem behavior domain. CBCL-internalizing proved not to be a statistically significant predictor and is therefore not included in the final model for further analyses.

Cognitive functioning. For the cognitive functioning domain as a whole a statistically significant omnibus χ^2 was found (χ^2 (2) = 77.51, $p < .01$). Both IQ (*B* = -.03, *SE* = .01, Wald = 10.40, *p* = .001) and academic performance (*B* = -1.00, *SE* = .18, Wald = 32.64, *p* = .000) were significant predictors of educational placement setting.

Child and family risk factors. The results of the initial logistic regression analysis for this domain showed a statistically significant omnibus χ^2 for the risk factors domain as a whole (χ^2 (8) = 81.46, $p < .01$) with the following three factors being significantly predictive of educational placement: relational problems between child and caregiver (*B* = 1.76, *SE* = .53, Wald = 11.07, *p* = .001), age of first time youth care (*B* = -.34, *SE* = .07, Wald = 23.15, *p* = .000), and Years of Education (*B* = -.22, *SE* = .05, Wald = 20.18, *p* = .000). The other five risk factors were not statistically significant predictors and were therefore not included in the final model for further analyses.

Table 1

Independent Samples t-tests for Groups Inclusive Education and Special School on Problem Behavior, Cognitive Functioning, Child and Family Risk Factors, and Family Functioning

	Incl. Education (*n* = 110)		Special School (*n* = 236)			
	M	*SD*	*M*	*SD*	*t*	*d*
Problem Behavior						
CBCL-internalizing	66.47	15.95	69.77	18.99	-1.59	.18
CBCL-externalizing	57.44	12.44	64.39	14.80	-4.28**	.49
TRF-internalizing	57.97	10.18	64.77	14.93	-4.96**	.53
TRF-externalizing	57.16	12.21	64.47	14.82	-4.84**	.53
Cognitive Functioning						
IQ	104	15.74	92	15.93	6.51**	.78
Academic performance	2.91	.81	2.11	.79	8.71**	1.00
Child and Family Risk Factors						
Psychiatric problems parents	.38	.49	.41	.49	-.53	.06
Psychiatric problems siblings	.15	.36	.20	.40	-1.18	.13
Parenting incompetence	.33	.47	.45	.50	-2.22*	.22
Years of Education	14.05	2.87	12.32	2.65	5.36**	.63
Age first time youth care	6.16	1.88	5.07	2.05	4.74**	.57
Childhood maltreatment	.02	.13	.11	.32	-3.97**	.36
Out-of-home care	.05	.23	.12	.32	-2.15*	.24
Relational problems child-caregiver	.05	.21	.24	.43	-5.76**	.56
Family Functioning						
Responsiveness	12.01	2.86	12.97	3.42	-2.50*	.31
Communication	19.99	5.99	21.95	5.74	-2.86**	.33
Organization	13.87	3.49	14.95	3.83	-2.45*	.30
Social network	17.37	6.43	19.93	7.59	-3.09**	.36
Partner relationship	15.41	5.06	17.80	6.01	-3.65**	.43

* $p < .05$, ** $p < .01$

Family functioning. The five variables of family functioning were included into an initial logistic regression analysis. A statistically significant omnibus χ^2 was found for the family functioning domain (χ^2 (5) = 18.88, $p < .01$). Of all subscales, the partner relationship factor turned out to be the only underlying predictor of educational placement (*B* = .05, *SE* = .03, Wald = 3.92, p = .048) and was therefore the one factor to be included into the final model.

Predicting Group Membership

Now the variables that add to the prediction of group membership are known for each domain of the multiple-risk model, a logistic regression analysis is done to determine the final model. All nine variables that significantly predicted educational placement in the initial logistic regression analyses were entered simultaneously into the equation (method Enter).

The Hosmer and Lemeshow statistic was not significant with a chi-square of 9.828 (*df* = 8), *p* = 0.277. This indicates that the model fits the data well, because the observed outcomes and predicted outcomes do not differ. Furthermore, the Omnibus test showed that the model as a whole proved to be significant. The model chi-square was 167.736 (*df* = 9), *p* < .01, indicating a statistically significant improvement in prediction using the model with all nine variables. This was also demonstrated by the improvement of correct predictions of placement. Using only the constant, 67.8 % of placements of children with EBD in special education were correctly predicted, while using the full model, the percentage of correct predictions rose to 83.5 %. In the full model, 70.3 % of children with EBD were correctly predicted as belonging to the inclusive education group and 89.7 % of children with EBD were correctly predicted as belonging to the special school group. Table 2 presents coefficients, the Wald statistic, associated degrees of freedom, and probability values for each of the predictor variables.

Table 2

Logistic Regression predicting Educational Placement in Restrictive Setting (*n* = 346)

	β	SE	*Wald Statistic*	df	*Sign.*	*Odds Ratio*
Problem Behavior						
CBCL-externalizing	.030	.013	5.444	1	.020*	1.030
TRF-internalizing	.052	.015	12.861	1	.000**	1.054
Child and Family Risk Factors						
Years of Education	-.124	.057	4.756	1	.029*	.883
Age first time youth care	-.394	.083	22.448	1	.000**	.674
Relational problems child-caregiver	1.763	.571	9.536	1	.002**	5.828
Family Functioning						
Partner relationship	.073	.029	6.112	1	.013*	1.075
Cognitive Functioning						
IQ	-.031	.011	8.531	1	.003**	.970
Academic performance	-.956	.208	21.153	1	.000**	.385

* *p* < .05, ** *p* < .01

The table shows that in the final model CBCL-externalizing, TRF-internalizing, age of first time youth care, Years of Education, relational problems between child and caregiver, partner relationship, IQ, and academic performance are all significant predictors of educational placement of children with EBD in special education. Although a significant predictor in the initial logistic regression analysis, TRF-externalizing turned out to be an irrelevant predictor in the final model. The values of the coefficients of significant predictor variables reveal that the odds of children with EBD being placed in special schools rather than inclusive education increases with a unit decrease in IQ, academic performance, Years of Education, and age of first time youth care. Also, the odds of children with EBD being placed in special schools rather than inclusive education increases with a unit increase in scores on the problem subscales CBCL-externalizing, TRF-internalizing, and partner relationship, and with a unit increase if there are relational problems between child and caregiver. The strongest predictors for educational placement setting are successively relational problems between child and caregiver, academic performance, and age of first time youth care. When relational problems between child and caregiver are present, the odds for placement in *a special school* are almost six times higher than for placement in an inclusive setting. Higher academic performance and older age of first time youth care increase the odds for placement in *an inclusive setting* over placement in a special school with respectively 2.6 and 1.5 times. The unstandardized beta's also indicate that the probability of placement in a special school is affected most by these three variables.

To rule out possible errors some additional stepwise regression analyses were performed with the nine significant variables from the initial regression analyses. Forward likelihood ratio, forward conditional entry, backward likelihood ratio, and backward conditional entry showed similar results as previously reported. In all four entry conditions the same eight variables proved to be significant predictors of educational placement, with the three before mentioned variables (relational problems between child and caregiver, academic performance, and age of first time youth care) identified as most important in a similar order. Odds ratios for the four different analyses were practically identical to the ones from the Enter method for all nine variables; except for relational problems between child and caregiver were the odds ratios ranged from 5.83-6.30 to 1.

Summarizing, the findings of before mentioned analyses suggest that educational placement in more restrictive settings is predominantly determined by poor academic performance, a young age when first entering youth care, and relational problems between child and caregiver.

Discussion

Conclusions

The aim of this study was to gain greater insight into what characterizes the special educational needs of children with EBD who visit special schools or receive inclusive education at regular schools, and to learn which of these characteristics affect inclusion of children with EBD in regular education. Knowledge of this kind can be used by parents, teachers, and policy makers to focus interventions more directly on these components, so that more children with EBD can attend regular schools.

Relevant indicators of children's special educational needs were examined in a group of 235 children with EBD who attend schools for special education, and a group of 111 children with EBD who receive inclusive education in regular schools. Overall, significant and substantial differences between the two groups were found. In general, children with EBD in special schools are more severely disabled, function on a lower cognitive level, experience more risk factors, and come from more poorly functioning families compared to children with EBD who receive regular education. No differences between children in special schools and children in regular education were found concerning the presence of psychiatric problems in parents and/or siblings. This contradicts the study of Robertson et al. (1998), who did find differences between groups of children in various settings of educational care, namely that children in more segregated parts of the educational continuum more often had parents with a history of mental illness. This conflicting result can reflect a real difference, but can also be due to the study method used. In the present study, assessment reports of the children were used to extract information about psychiatric problems of family members. Because the focus in these records lies primarily on children's special educational needs, the presence of psychiatric problems was probably not reported consistently. Of course this does not mean that these problems do not occur.

In order to examine if the variables on which the two groups differed were actually predictive of the setting in which children with EBD receive education, a logistic regression analysis was performed with the placement setting as the dependent variable (restrictive or special school versus non-restrictive or regular school). In the final model eight factors were determined that increase the chance of children with EBD being placed in a special school instead of an inclusive educational setting: high scores on CBCL-externalizing problems and TRF-internalizing problems, relational problems between child and caregiver, problems with partner relationship, low number of years of education, entering youth care at a young age, low IQ, and poor academic performance. Of these eight factors found, the presence of relational problems between child and caregiver, poor academic performance, and a young age when youth care was called in for the first time reflect the

characteristics of children with EBD that are apparently the most difficult to handle in regular educational settings with additional support.

The importance of 'academic performance' as a predictor of educational placement setting is further supported by the fact that academic difficulties and underachievement are often found to coincide with behavioral problems (Handwerk & Marshall, 1998; McConaughy & Mattison, 1994; Reid et al., 2004). For most regular schools adequate support for this combination of special educational needs characteristics is not easy to provide (Landrum, Tankersly, & Kauffman, 2003), so that it is understandable that children who display EBD along with academic difficulties have a higher chance of being placed in special schools or more restrictive settings.

Furthermore, the relatively large impact of 'age of first time youth care' on distinguishing children with EBD in special schools from children with EBD who receive inclusive education can be explained by findings which imply that an early onset of emotional and behavioral problems – in many cases accompanied by early involvement of youth care – is related to severity and chronicity of the problems (Hosp & Reschly, 2002; Silver et al., 1992). Considering the generally limited resources of regular schools to support children with serious problem behavior (Landrum et al., 2003), it could be very likely that children who have experienced youth care at an early age, and are therefore prone to more severe and chronic disabilities, will be placed in special schools or more restrictive settings sooner than children with milder disabilities.

Our finding that relational problems between children with EBD and their caregivers is the strongest predictor of educational placement in a restrictive setting seems difficult to understand at first sight, because this factor is not intrinsically related to the conceptualization of special educational needs of children that is generally used. However, the role of this factor can be understood when the principles of a multiple-risk model, with protective and risk factors interacting and influencing normal and deviant development of children, are used as an explanatory framework. An important area where risk factors can linger is family functioning. Theory and research both suggest that the interaction between child and caregiver is one of the most important predictors of problem behavior, with negative reinforcement and negative emotional bonding between child and caregiver increasing the probability of disruptive and antisocial behavior (e.g., Field, 2002; Stormshak, Speltz, DeKlyen, & Greenberg, 1997). In this respect Bronfenbrenner (2005) suggests that a mutual emotional attachment between child and caregiver leads to an internalization of activities and feelings of affection that caregivers display, which in turn motivates the child to engage in the social environment. Children with less satisfying relationships with their caregivers have less positive views of themselves and more often engage in problem behavior. A possible way in which a troubled relationship between child and caregiver can affect functioning in an educational setting is reflected upon in a study by Kellam, Ling, Merisca, Brown, and Ialongo (1998). They state that children's maladaptive

aggressive behavioral response to classroom demands "may depend on family processes that precede and parallel the classroom social adaptational process, including the likelihood of coercive family interaction" (p. 182). This implies that when children interact with their caregivers in a negative manner which reinforces maladaptive behavioral responses, it is possible that such coercive interactions are translated to a classroom setting with teachers and peers, and that the maladaptive behavior can escalate to more severe aggressive behavior within the classroom. Additionally, research indicates that variables related to stress in family functioning and in relationships between family members (maternal depression, quality of home environment, child maltreatment) are associated with more segregated types of educational settings for children with EBD (Jonson-Reid et al., 2004; La Paro et al., 2002; Robertson et al., 1998; Westendorp et al., 1986). It could therefore be argued that children with EBD who experience relational problems with their caregivers often have more severe disabilities than children with EBD who do not have such problems, or to a lesser extent. Given the before mentioned lack of regular schools to be able to provide proper support for severe behavioral problems, the chances that these children will end up in special schools will increase.

The importance of academic performance, age of first time youth care, and relational problems between child and caregivers to predict the level of restrictiveness in educational placement for children with EBD are comparable to those reported by Hosp and Reschly (2002) for children with learning disabilities (LD). They found an almost similar set of factors, namely severity of academic difficulties, presence of behavioral problems, and family involvement, which largely influenced decisions regarding the placement of children with LD in more and less restrictive educational settings. This parallelism suggests that the three main predictors determining the restrictiveness of educational placement found in this study apply not only to children with EBD but also to children with LD, which stresses the importance of these factors for intervention purposes in special educational settings.

Limitations of the Present Study

Some considerations and cautions apply to the interpretation of our study results. First, because the sample was taken from several special schools in an urbanized part of the Netherlands there are limitations to the generalizability of the findings to children in other settings and countries. Therefore, our study needs to be replicated with children from different ethnic and demographic backgrounds and older age groups, not only in the Netherlands, but also in other countries to be able to conclude that the factors that most strongly influence decision making with respect to educational setting are robust, despite other possible influences. Second, our research was based on two types of education for children with EBD: special schools and inclusive education in a regular classroom. Because in the Netherlands only these two forms of special education are available, other types of

special and inclusive education between these two extremes were not investigated. Previous research on educational placement of children with EBD focused primarily on the more segregated part of the special educational continuum. Consequently, the 'in-between forms' of special education have not yet been evaluated. With this in mind, future research should not focus on children with EBD who receive education in the most segregated settings, but should rather aim at including groups of children with EBD in a larger variety of settings on the special-education continuum, especially those settings which are close to the fully integrated part. Third, despite careful initial consideration, probably not all variables that are potentially important predictors of educational placement were included in the analyses, because a selection of instruments and variables had to be made. Although the results of this study are in line with previous research and theory, other discriminating factors may have come up as well if an even more extended set of (risk) variables had been used. However, the inclusion of relational problems between the child and caregiver in such a set of variables was a new aspect, not previously included in similar studies.

Implications for Practice

Despite the limitations mentioned above, our findings can be meaningful for clinical practice and policy making. The results indicate that children who are coping not only with EBD but also with academic problems and severe disturbances in the relationship with their caregivers are generally not assimilated in an inclusive educational setting. Taking into account the importance of the variable 'age of first time youth care' in the analyses, this implies that in order to place more children with EBD in regular education, facilities must provide early and intensive interventions for children at risk for or diagnosed with EBD, which should also include academic and parental components. It is therefore important that education for children with EBD is more than only offering a place for difficult children to learn; it should also aim at promoting a healthy emotional and behavioral development. Although this is not the core responsibility of schools, it does fit their contributing role in the upbringing of children, since children spend a large part of the day within the school walls.

In order to develop the strategies used in the educational and behavioral development of children with EBD, interventions in schools could therefore include applying principles of the methods used to reduce dysfunctional behaviors in children, such as offering a supportive, responsive, and consistent environment in which positive behavior is encouraged and problem behavior limited (Fisher, Stoolmiller, Gunnar, & Burraston, 2007). In addition, it is important to pay more attention to the co-morbidity of behavioral problems and academic problems at an early stage. The interfering nature of problem behavior tends to overshadow learning difficulties these children experience, which could result in even more problems in this area. The support given by regular

schools must therefore focus on multiple problem areas at the same time, and place extra emphasis on academic performance.

Inevitably, to improve teachers' and other school personnel's ability to make all this work, extra training and support is needed. This does not only apply to teachers already at work in the field, but also to teachers-to-be. Teacher training colleges should focus their curriculum more on handling and supporting children with EBD in regular classrooms. Because relational problems between children and caregivers turns out to be an important contributor to placement in a more restricted educational environment, special attention could for example be given to current knowledge of treatment concerning the sequela of bio-behavioral problems associated with inadequate caretaker relationships (Field, 2002; Fisher & Stoolmiller, 2008), in order to extend the theoretical background of teachers concerning this topic.

Besides teachers' efforts to assist children with EBD in inclusive settings, it is also of great importance that caregivers take part in children's education and treatment (Hosp & Reschly, 2002). In this context, Cartledge and Johnson (1996) point out that it is unlikely that teachers in regular education can support children with EBD in an effective manner without the assistance of the children's parents. Teachers and schools must therefore invest in a productive parent-professional partnership in which there is room for open communication. Also, problem behavior is more likely to diminish when treatment principles are applied consistently across environments. Schools must therefore stimulate a higher involvement of, and concern for, the caregivers of children with EBD. One way to achieve this is by offering occasional parent trainings in which parents become familiar with the treatment given to their children, so that they can continue it at home. This, and the greater involvement in their child's education, could also decrease feelings of isolation parents experience when managing a child with behavioral problems, which in turn can lead to a more positive relationship between child and caregiver (Fisher & Stoolmiller, 2008). Furthermore, if caregivers require specialized instructions on how their child with EBD can be handled positively schools are generally seen as more easily approachable than professional youth care services. Under the pretext of support for their child, schools can encourage caregivers to get in touch with social and youth care services when needed.

However, taking into account the complexity of the problems of children with EBD that are placed in separated facilities, and the fact that this and other studies have shown that children with EBD are the most difficult to include in regular educational settings (Cartledge & Johnson, 1996), it is questionable whether regular schools will ever be able to provide suitable education for children who have to cope with the most severe emotional and behavioral disorders. For these children special schools, or wholly or partly separated facilities with more knowledge, time, and means to handle children with this type of behavioral problems will probably always be needed.

Presumably, inclusive education can therefore not be achieved for some children with EBD. With an ongoing special educational continuum in mind it is thus important to develop procedures that take into account the individual needs of these children and can accurately assign children with EBD to the educational setting that best anticipates to these needs. As for now, there are still gaps in this process concerning identification and the need for intervention (Kauffman, 2001), which can lead to children with EBD being placed in unnecessarily restrictive environments (Epstein & Cullinan, 1994). We hope that the results of this study can contribute to refining the identification of children with EBD who need adequate educational support.

Last, the findings of our study are of a descriptive nature; therefore, additional research on what works in the classroom for a range of emotional and behavioral problems is needed (Wagner et al., 2005) to provide a more solid basis for adequate support of these problems in various settings of educational care. To gain more insight into the aspects of special educational care that can stimulate positive development of children with EBD, a longitudinal follow-up study has been started on the two samples used in this research, covering the emotional, behavioral, and academic development of the children.

Behavioral and Academic Progress of Children displaying Substantive ADHD-Behaviors in Special Education: A One-Year Follow-up

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Abstract

This study explored differences in behavioral and academic progress between children displaying substantive ADHD (Attention Deficit Hyperactivity Disorder) behaviors (mean age of 9.4 years) in special schools (*n* = 38) and in inclusive education (*n* = 26). The contribution of pedagogical strategies to positive outcomes was also examined. Measurements used were the Teachers' Report Form, the Social Emotional Questionnaire, assessments of academic achievement, and the Pedagogical Methods Questionnaire. Mixed-model ANOVAs and Pearson's correlations were used to analyze the data. Significant progress was found on disorder-specific problem behavior and in all academic areas, but no interaction effect between time and setting. These findings indicate that children displaying substantive ADHD behaviors in both groups develop equally well regarding these measures of behavioral and academic functioning. Correlations indicated that positive behavior reinforcement and emotional support are the pedagogical strategies that contributed most to behavioral adaptation.

Introduction

Inattentive, impulsive, and hyperactive behavior that varies in intensity is rather common among children in the general population (Levy, Hay, McStephen, Wood, & Waldman, 1997; Polderman et al., 2007). However, if such behavior becomes developmentally inappropriate, an Attention Deficit Hyperactivity Disorder (ADHD) could be present. According to the criteria of the Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition, Text Revision (DSM-IV-TR; American Psychiatric Association (APA), 2000), ADHD can be diagnosed when problems such as excessive motor activity, inability to sustain attention, difficulty in taking turns, and interrupting others persist over six months and cause significant impairments of daily functioning in multiple settings such as home and school. Approximately 8 % of school-age children in the United States are diagnosed with ADHD (Centers for Disease Control and Prevention (CDC), 2012), and similar prevalence estimates are found worldwide (Skounti, Philalithis, & Galanakis, 2007). Due to their characteristic symptoms and impairments a classroom can be a challenging environment for children with ADHD.

Findings of studies on academic and behavioral functioning of children with ADHD in an educational setting indicate that there are several areas of concern. First of all, academic underachievement is very common within this population, regardless of cognitive abilities (Barry, Lyman, & Klinger, 2002). It is especially reading and mathematics that cause considerable difficulties (Frazier, Youngstrom, Glutting, & Watkins, 2007; Massetti et al., 2008). What is more, this underachievement is found to persist into adolescence and results in negative academic prospects across the lifespan (Daley & Birchwood, 2010; Ek, Westerlund, Holmberg, & Fernell, 2010). Second, difficulties in social interaction with classmates and teachers are significantly more often observed in children with this disorder than in typically developing peers, especially when aggressive behavior is present (Batzle, Weyandt, Janusis, & Deviett, 2010; Hinshaw, 2002; McConaughy, Volpe, Antshel, Gordon, & Eiraldi, 2011). It is worrisome in this respect that symptoms of opposition, defiance, and aggression are often associated with ADHD (LeFever, Villers, Morrow, & Vaughan, 2002; Owens et al., 2005), and that oppositional defiant disorder (ODD) is one of the disorders most frequently co-diagnosed (Jensen, Martin, & Cantwell, 1997).

A consequence of these impairments is that children with ADHD are more likely to require special educational support in either a regular classroom or a more restrictive environment such as a resource classroom or a school for special education (Biederman et al., 1996; Kendall, Leo, Perrin, & Hatton, 2005; Marks et al., 2009). Findings even indicate that these children are significantly less likely to spend the majority of instructional time in a regular classroom than children with disabilities other than ADHD (Schnoes, Read, Wagner, & Marder, 2006). Considering the urgent need for support and the risk of falling

behind in academic performance, it is important to monitor academic and behavioral outcomes in order to determine if children make sufficient progress and timely identify areas where additional support or intervention is needed.

Another valuable reason for collecting data about progress outcomes is that such information is relevant to decisions about educational placement (Charman, Howlin, Berry, & Prince, 2004). Parents generally have a major voice in these decisions. However, studies have shown that choices between special educational settings are often based on parental preferences and beliefs about the extent to which educational settings can provide proper support, and the perceived social impact on their child (e.g. Connor, 1997; De Boer, Pijl, & Minnaert, 2010; Leyser & Kirk, 2004; Runswick-Cole, 2008), rather than on information about developmental prospects. This also seems to be the case in the Netherlands. Parents' comparative assessment regarding placement of their child in special or in inclusive education is often driven by opinion and emotion. Therefore, placement decisions are partly guided by prejudices against special schools and in favor of inclusive education, and vice versa (De Greef, & Van Rijswijk, 2006). Demographic preferences also play a role, such as whether or not the school is in the vicinity (De Greef, & Van Rijswijk, 2006). In order to enable both parents and professionals to make better informed placement decisions, it is important that they have information at their disposal about developmental progress of children in various special educational settings.

There have been many studies on outcomes of children with ADHD regarding academic achievement and aspects of behavioral functioning such as aggression, social interaction, and classroom behavior (e.g. Barnard, Stevens, To, Lan, & Mulsow, 2010; Jitendra et al., 2007; Kern et al., 2007; Merrel & Tymms, 2001). However, to our knowledge, in none of these studies developmental outcomes have been compared across different special educational settings, even though children with ADHD can receive special educational support in settings of varying restrictiveness. Our study will be the first to compare progress between children displaying substantive ADHD behaviors in special schools and in inclusive education. Also, it is one of few recent studies to monitor progress for the duration of a year. Most previous research has been experimental by nature and often measures progress by evaluating a specific intervention implemented in a classroom context (e.g. Barnard et al., 2010; DuPaul, Weyandt, & Janusis, 2011; Fabiano et al., 2010; Miranda, Presentación, & Soriano, 2002; MTA Cooperative Group, 2004; Owens et al., 2005). In contrast with this type of research, no program intervention or consultation was provided to teachers in either educational setting. Because natural conditions were maintained, outcomes will be more representative of the typical practice in community-based special educational settings (Owens & Murphy, 2004; Raggi & Chronis, 2006). With this idea in mind, differences between the two settings regarding the use of common pedagogical strategies in the daily classroom support of children displaying substantive ADHD behaviors were also explored, as were the contributions of these strategies to

positive outcomes. Results will extend current knowledge, because so far it has been unclear what kind of pedagogical strategies are used to support children with ADHD in special educational settings, to what extent they are used, and the effectiveness of these strategies (Danforth & Kim, 2008; Loe & Feldman, 2007).

For the study reported here, two research questions were formulated: (1) Do children displaying substantive ADHD behaviors and who receive special educational support benefit in terms of development in academic and behavioral aspects, and are there differences between special educational settings with regard to this development? (2) Are there differences between educational settings regarding pedagogical strategies used to support children displaying substantive ADHD behaviors, and which of these strategies are linked to positive development? Although our study was explorative in nature, the following hypotheses were formulated with respect to the outcomes: (1) Children displaying substantive ADHD behaviors show progress in both settings in behavioral functioning and academic achievement. Differences between settings may be that children in special schools make greater progress in both areas than children in regular classrooms, because the school and classroom environment of special schools is more geared toward special (educational) needs of children displaying ADHD-associated behaviors. (2) Concerning pedagogical strategies we hypothesized that in special schools these are emphasized more strongly than in regular schools, because of the lower teacher-student ratio. Providing a special pedagogical climate is generally also a more intrinsic aspect of the daily practice in special schools. Strategies aimed at structuring the learning environment are expected to be most closely related to positive development, along with those offering emotional support (Scholte, Van Berckelaer-Onnes, & Van der Ploeg, 2007).

Method

Procedure

Data were collected at schools for special education and at regular schools that provide support for children with special educational needs, in an urban part of the Netherlands. Parents of 4- to 12-year old children receiving special educational support were requested to participate in the study, and to give written informed consent to information about their children being provided by schools and teachers. To select the parents, a random sample was taken of seven out of sixteen special schools and of two out of four educational services providing special educational support in regular schools. Special schools connected to residential facilities were excluded from the sample. Subsequently, we then asked the teachers of the children for whom consent had been obtained and school psychologists based at the schools monitoring the development of these children to fill in relevant questionnaires that could be returned to Leiden University. Depending on the questionnaire, the forms were filled in either by teachers or by school psychologists. Pre-

and post-assessment questionnaires were completed for 180 children with emotional and behavioral disorders. The surveys took place approximately half way through the school year (mean interval of 11 months), which resulted in two different teachers rating children's behavioral functioning and academic achievement, thus reducing teacher bias. The responding school psychologist remained the same throughout the assessments.

Participants

All children in the sample were eligible for special educational support, because they met the admission criteria designed by the Dutch government. . The criteria used by the service sector for children with ADHD (children with emotional and behavioral disorders) consist of three parts: (1) a developmental, behavioral and/or emotional disorder according to the DSM-IV-TR (APA, 2000), accompanied by (2) serious impairments to attending regular education which (3) the continuum of regular educational care can not provide without additional services (Ministerie van OCW [Ministry of Education], 2006). Examples of such serious impairments are relational problems with classmates and/or teachers, being a danger to others and/or oneself, and severe motivational and attention problems. An independent committee assesses whether a child is eligible for special education. Subsequently, the child's teacher determines, in consultation with the parents, whether special educational support should be provided in a special or a regular school.

From the main sample of 180 children with emotional and behavioral disorders with a pre- and post-assessment, we selected 64 children who displayed substantive ADHD behaviors. In order to be included in the subsample being studied, children had to score in the clinical range (defined as the 95th and higher percentiles in the standard Dutch youth population) on the 'ADHD Total' subscale of the *Social Emotional Questionnaire* (SEQ; Scholte, Van Berckelaer-Onnes, & Van der Ploeg, 2008), a rating scale based on the diagnostic criteria of the DSM-IV-TR. Although this cut-off point implies that the children in the subsample display high levels of ADHD-associated behaviors, only about 36 % of the children were formally diagnosed with the disorder (see Table 1). Therefore, we will here use the term 'displaying substantive ADHD behaviors' to refer to the children in the subsample. Teachers served as informants, because it is behavior in an educational setting that was examined, and studies have shown that teacher ratings are a reliable way of measuring ADHD problems (American Academy of Child and Adolescent Psychiatry (AACAP), 2007; American Academy of Pediatrics (AAP), 2001; Lauth, Heubeck, & Mackowiak, 2006). To be included in the sample, a full-scale IQ of 85 or higher was required, to ensure that children included in the study were functioning at an intelligence level within or above the normal range.

Table 1

Differences between Children in Special Schools (n = 38) and Children in Inclusive Education (n = 26) on Background Variables at Time of Pre-assessment

		Spec. School	Incl. Ed.	Test
		M (SD)	*M (SD)*	
Age		9.3 (1.76)	9.5 (1.64)	$t = .31$; $p = .761$
IQ		100 (10.34)	104 (11.05)	$t = 1.37$; $p = .177$
Years spent in setting		1.9 (1.29)	2.0 (.94)	$t = .31$; $p = .754$
Formal diagnosis ADHD (% yes)		32 %	44%	$\chi^2(1) = 1.33$, $p = .250$
Psychotropic medication (% yes)		42 %	54 %	$\chi^2(1) = .87$, $p = .352$
Ethnicity (% Caucasian)		84%	96 %	$\chi^2(1) = 2.26$, $p = .225$
SES	% lower education	24 %	12 %	
	% secondary education	43 %	31 %	$\chi^2(2) = 4.21$, $p = .122$
	% higher education	33 %	57 %	

Two groups were studied: one group of 38 children placed in separate facilities for special education (*Special School*) and one group of 26 children who were fully integrated in regular classrooms where they received special educational support (*Inclusive Education*). Grade levels ranged from third to fifth grade, with a majority of the children in fourth grade. In Table 1 statistics on relevant background variables of both settings are displayed. Analyses showed no significant differences between children on any of the variables at the time of pre-assessment. Also, the distribution of boys and girls in both settings is approximately similar (respectively 87 % boys within *Special School*, and 85 % boys within *Inclusive Education*). Our sample did not include any children with comorbid oppositional defiant disorder (ODD) or conduct disorder (CD).

There are in principal no distinct differences in teaching materials or curriculum. Neither the special schools nor the regular schools provide additional treatments such as family support or residential care; they only focus on care related to educational disabilities. In special schools this care is provided by specialized teachers, teacher aides (paraprofessionals), and school psychologists. The teachers in regular schools are coached by professionals from special educational services, also including school psychologists. In addition, children in regular classrooms receive support from learning support teachers (either visiting or based at the school). Differences between settings mainly concerned the school environment. Compared to children in regular classrooms, children in special schools are placed in classrooms with fewer children, a more structured daily program, and

fewer stimuli. Unlike children in regular classrooms they have limited to no opportunity to interact with typically developing peers during school hours.

Measures

Progress in children's functioning during one year was evaluated by pre- and post-assessments on multiple measures regarding behavioral functioning and academic achievement. Because children with ADHD can display general problem behavior alongside disorder specific behavior (DuPaul & Stoner, 2003; Owens et al., 2005), progress for both types of behavior was measured separately.

The raw scores on the subscales Hyperactive/Impulsive behavior and Inattentive behavior of the SEQ were used to measure severity of symptoms specific for ADHD. With the SEQ the presence of symptoms according to the DSM-IV-TR criteria of common developmental disorders in childhood can be assessed. Teachers rated the presence of symptoms by responding on a five-point scale (1 = not at all, 2 = sometimes/incidentally, 3 = regularly/monthly, 4 = often/weekly, 5 = very often/daily). Psychometrics all met the requirements for tests for diagnostic purposes (Nunnaly & Bernstein, 1994). The internal consistency of the subscales from our sample was measured with Cronbach's alpha (α) and found to be 0.84 for the subscale Inattentive behavior and 0.86 for the subscale Hyperactive/Impulsive behavior.

The Dutch version of the *Teachers' Report Form* (TRF; Verhulst, Van der Ende, & Koot, 1997) was used to obtain non-disorder-specific problem behavior as perceived by the child's teacher. The raw scores of the eight narrow band subscales (i.e., Withdrawn/Depressed, Somatic complaints, Anxious/Depressed, Social problems, Thought problems, Attention problems, Rule-breaking behavior, and Aggressive behavior) were used in the present study to measure severity of general behavioral problems. Teachers rated behavioral and emotional problems by answering 118 questions with a response set (0 = not true, 1 = sometimes true, 2 = very true or often true). Satisfactory Cronbach's alpha's for internal consistency were found from our sample, ranging from 0.66 for the subscale Rule-breaking behavior to 0.94 for the subscale Aggressive behavior .

Academic achievement was measured by means of the method recommended by the Dutch Ministry of Education to assess educational achievement annually (CITO [Central Institute for Test Development], 2009). The assessment battery consists of tests for reading (Krom & Kamphuis, 2001), spelling (Moelands & Kamphuis, 2001), and mathematics (Jansen & Engelen, 2002), and gives the performance level of students in terms of months of education. Ten months equals one school year. The performance level can also be compared to a norm group of peers in order to determine if a child is behind, on the same pace, or ahead of other children of the same age and school type. The tests for reading comprise tasks measuring for example context use, comprehension, and oral reading errors. The tests for mathematics include tasks measuring correct use of problem

solving strategies and basic number sense. The tests for spelling comprise tasks measuring for example oral spelling errors and capability of linking graphemes to corresponding phonemes. In the present study, the overall performance level of text reading accuracy, reading comprehension, mathematics, and spelling were used in the analyses. The tests all met the psychometric requirements of tests for diagnostic purposes with a Cronbach's alpha of 0.83 or higher for the subscales on reading, 0.86 or higher for the subscales on mathematics, and 0.87 or higher for the subscales on spelling (CITO, 2009). IQ scores were obtained from diagnostic reports in the school assessment files of the children. The *Wechsler Intelligence Scale for Children-Revised* (WISC-R; Van Haasen et al., 1986) was used to measure intelligence. Assessments were completed by a qualified clinician as part of the admission procedure for special education. On average these assessments took place approximately two years before the present study was conducted (see Table 1; Years spent in setting).

To explore pedagogical strategies used within the classroom to improve children's functioning, school psychologists were asked to fill in the *Pedagogical Methods Questionnaire* (PMQ). With this inventory list respondents can indicate to what extent teachers emphasize common pedagogical strategies used for children with ADHD in their daily classroom support. The use and emphasis on these strategies are instructed and monitored by the school psychologists and are registered in Individualized Education Programs (IEP's). Assessments take place on four-point scales (1 = no emphasis, 2 = small emphasis, 3 = medium emphasis, 4 = large emphasis). Four strategies aimed at behavioral and emotional functioning were included, namely (a) Structuring of (learning) environment (e.g. using picture activity schedules and timers, contingency management, screening off workplace), (b) Positive behavior reinforcement (e.g. praising desired behavior and ignoring negative behavior, using preferred items as a reward), (c) Offering emotional support (e.g. emphasizing individual qualities, showing understanding and compassion, and building trust), and (d) Reinforcement of social and communicative behavior (e.g. peer mediation, modeling, cognitive re-labeling of situations and social interactions). These common strategies were based on literature about intervention and treatment of children with ADHD (e.g., DuPaul et al., 2011; Martinussen, Tannock, & Chaban, 2011; Rief, 2005; Wilkinson, & Lagendijk, 2007). To get an indication of the intensity of support given to children regarding academic achievement, three PMQ items were used, i.e., (e) providing individual instruction, (f) using concrete instructions, and (g) repetition of assignments and instructions. The reliability of this instrument was determined in a separate study where the PMQ was filled in by the same raters within three weeks (test-retest reliability). Intra-class correlations of 0.80 and above were found between both PMQ measurements (Scholte, Van Berckelaer-Onnes, & Van Oudheusden, 2007), suggesting sufficient test-retest reliability (Nunnaly & Bernstein, 1994).

Results

Preliminary Analysis

To conduct the statistical analyses, IBM SPSS Statistics 19 was used. First, to determine if children in both settings are comparable at the time of pre-assessment, differences between children displaying substantive ADHD behaviors in special schools and in inclusive education on the pre-assessment measures concerning behavioral functioning and academic achievement were examined with several independent sample *t*-tests (two-tailed). Given the number of *t*-tests conducted, a Bonferroni correction was applied to the analyses, resulting in an adjusted significance level of $p < .005$ for the measures of behavioral functioning and $p < .013$ for the measures of academic achievement. The results are presented in Table 2. (Mean scores and standard deviations are displayed in Tables 3 and 4 respectively.) No significant effect ($p > 0.05$) of setting was found on any of the variables. This implies that at the start of the study, children in both settings had comparable behavioral and academic needs, and therefore internally valid comparisons can be made between both settings with regard to behavioral and academic development.

Table 2

Results of Independent Samples t-tests (two-tailed) between Children with ADHD in Special Schools (n = 38) and Inclusive Education (n = 26) on Problem Behavior, ADHD Symptoms, and Academic Achievement

	t	*p*
Problem Behavior		
Withdrawn/ depressed	-1.086	.282
Somatic complaints	.018	.985
Anxious/ depressed	-1.700	.094
Social problems	.023	.981
Thought problems	-.509	.631
Attention problems	.985	.374
Rule-breaking behavior	-1.827	.072
Aggressive behavior	-1.474	.145
ADHD Symptoms		
Inattentive behavior	1.954	.055
Hyperactive/ Impulsive behavior	-.122	.903
Academic Achievement		
Reading accuracy	.264	.793
Reading comprehension	-1.042	.305
Spelling	-1.044	.303
Mathematics	.955	.345

Progress in Behavioral Functioning and Academic Achievement

Progress in behavioral functioning and academic achievement was analyzed with 2 (Setting: Special School vs. Inclusive Education) x 2 (Time: Pre- and Post-assessment) mixed-model ANOVA's. Developmental progress is indicated by a significant main effect of Time (within-subject factor) for a specific outcome variable. A main effect for Setting (between-subject factor) indicates that a difference in mean scores exists between specials schools and inclusive education regardless of time. An interaction between Time and Setting indicates a difference in the degree of progress between special schools and inclusive education.

To define the magnitude of the effect, partial eta squared (η^2_p) is reported (small effect: $\eta^2_p \sim 0.03$; moderate: $\eta^2_p \sim 0.06$; large: $\eta^2_p \geq 0.14$) (Stevens, 1986). The adopted significance level after Bonferroni correction was $p < .005$ for the measures of behavioral functioning and $p < .013$ for the measures of academic achievement.

Mean scores and standard deviations at the time of pre- and post-assessment for children in special schools and inclusive education separately are shown in Tables 3 and 4. Results of the mixed model ANOVA on each variable measuring behavioral functioning and academic achievement are presented in the last three columns which represent the main effects for group and time, and the interaction effect between group and time.

Regarding behavioral functioning, a main effect for time was found for inattentive behavior (F [1,62] = 8.31, p = .003, η^2_p = .12) and hyperactive/ impulsive behavior (F [1,62] = 8.06, p = .004, η^2_p = .12). This indicates that the problem scores on these two subscales decreased significantly within subjects during approximately one year of special educational support. A trend towards significant decrease was found for problem scores on the TRF subscales somatic complaints (F [1,62] = 6.68, p = .010, η^2_p = .10), social problems (F [1,62] = 4.93, p = .030, η^2_p = .07), thought problems (F [1,62] = 5.17, p = .026, η^2_p = .07), and attention problems (F [1,62] = 4.10, p = .047, η^2_p = .06). No significant interaction effect between time and group was found. This suggests that children displaying substantive ADHD behaviors in special schools and in inclusive education developed equally positive regarding inattentive and hyperactive/ impulsive behavior.

Regarding academic achievement, a significant main effect for time was found for all areas of academic development: text reading accuracy (F [1,62] = 8.21, p = .007, η^2_p = .19), reading comprehension (F [1,62] = 13.77, p = .001, η^2_p = .35), mathematics (F [1,62] = 59.86, p = .000, η^2_p = .60), and spelling (F [1,62] = 23.92, p = .000, η^2_p = .41). This indicates that the children in the sample made significant progress on these variables within approximately one year.

The absence of a significant interaction effect suggests that children displaying substantive ADHD behaviors in special schools do not differ from their counterparts in inclusive education regarding the degree of progress that is made in academic achievement.

Table 3

Progress in Problem Behavior and ADHD Symptoms of Children in Special Schools (n = 38) and Inclusive Education (n = 26) during a 1-year Follow-up

	Pre-assessment		Post-assessment		Effects		
	Spec. School	Incl. Ed.	Spec. School	Incl. Ed.	Setting	Time	Setting x Time
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*F*	*F*	*F*
Problem Behavior							
Withdrawn/ depressed	5.13 (3.31)	4.15 (3.84)	5.08 (3.40)	4.23 (3.60)	1.42	< 1	< 1
Somatic complaints	0.76 (1.34)	0.77 (1.24)	0.29 (0.61)	0.38 (0.83)	< 1	6.68	< 1
Anxious/ depressed	8.82 (6.69)	6.42 (4.57)	8.39 (5.77)	5.77 (4.14)	3.97	< 1	< 1
Social problems	4.71 (3.31)	4.73 (3.56)	4.32 (3.21)	3.27 (2.00)	< 1	4.93	1.63
Thought problems	2.87 (2.92)	2.54 (1.86)	2.11 (2.37)	1.85 (1.67)	< 1	5.17	< 1
Attention problems	15.50 (7.71)	17.23 (7.43)	14.45 (7.17)	14.46 (8.35)	< 1	4.10	< 1
Rule-breaking behavior	1.87 (2.23)	0.92 (1.69)	1.79 (2.17)	1.35 (1.79)	2.14	< 1	1.66
Aggressive behavior	14.39 (12.05)	10.31 (8.92)	13.26 (10.99)	8.92 (10.49)	2.71	1.70	< 1
ADHD Symptoms							
Inattentive	7.82 (5.52)	10.73 (6.34)	6.45 (4.75)	8.19 (5.50)	3.70	8.31*	< 1
Hyperactive/ Impulsive	8.80 (5.09)	8.65 (4.28)	7.37 (5.02)	7.08 (5.26)	< 1	8.06*	< 1

* $p < .005$ (adjusted significance level after Bonferroni correction)

Table 4

Progress in Academic Achievement of Children in Special schools (n = 38) and Inclusive Education (n = 26) during a 1-year Follow-up

	Pre-assessment		Post-assessment		Effects		
	Spec. School	Incl. Ed.	Spec. School	Incl. Ed.	Setting	Time	Setting x Time
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*F*	*F*	*F*
Text reading accuracy	22.38 (14.61)	19.75 (10.50)	29.41 (15.21)	22.88 (14.91)	<1	8.21*	1.22
Reading comprehension	32.65 (11.46)	27.00 (11.41)	43.47 (16.10)	33.09 (10.23)	3.29	13.77*	1.08
Mathematics	22.60 (16.32)	25.00 (11.76)	30.43 (16.30)	30.58 (12.37)	<1	59.86*	1.68
Spelling	23.32 (16.30)	19.83 (8.28)	31.44 (16.27)	27.42 (16.25)	<1	23.92*	< 1

* $p < .013$ (adjusted significance level after Bonferroni correction)

However, at the time of pre-assessment, both children in special schools and children in inclusive education were already lagging behind on all subjects. On text reading accuracy they were on average 6.7 months behind (*SD* = 8.68), on reading comprehension 3.9 months behind (*SD* = 5.55), on mathematics 4.1 months behind (*SD* = 5.69), and on spelling 7.7 months behind (*SD* = 8.88). No significant differences were found between groups on the mean number of months the children were behind ($p > .05$). Furthermore, the difference scores between pre- and post-assessment show that the children did not make the acquired progress of 10 months within a school year on almost all of the subjects, indicating an increase in the number of months they are behind. In other words, they made significant progress on all subjects, but this progress was not enough to make up any arrears.

Pedagogical Strategies Related to Progress

Independent sample *t*-tests (two-tailed) were also conducted to examine differences between both settings regarding the extent in which pedagogical strategies were emphasized in the daily support of these children. Bonferroni correction was applied, resulting in an adjusted significance level of $p < .007$. No significant differences were found between settings with regard to the emphasis on pedagogical support strategies ($p > 0.05$) (Table 5).

Table 5

Results of Independent Sample t-tests between Children with ADHD in Special Schools and Inclusive Education Reflecting the Emphasis of Pedagogical Strategies Used

	Special school (n = 38)	Inclusive education (n = 26)		
	M (SD)	*M (SD)*	*t*	*p*
Behavioral Functioning				
(a) Structuring (learning) environment	3.37 (.94)	3.56 (.58)	.997	.323
(b) Positive behavior reinforcement	3.21 (.66)	3.12 (.67)	-.529	.599
(c) Offering emotional support	2.95 (.90)	3.24 (.88)	1.275	.207
(d) Reinforcement of social and communicative behavior	3.53 (.60)	3.48 (.65)	-.288	.774
Academic achievement				
(e) Providing individual instruction	3.45 (.72)	3.28(.84)	-.841	.404
(f) Using concrete instructions	3.34 (.71)	3.24 (.72)	-.555	.581
(g) Repetition of assignments and instructions	2.92 (.97)	2.96 (.79)	.168	.868

Additionally, exploratory correlational analyses were conducted with Pearson's correlations to examine which strategies of the PMQ relate to behavioral and academic progress, measured as difference scores between pre- and post-assessment on the behavioral and academic measures. Correlations around .10 are considered small, around

.30 medium, and around .50 large (Cohen, 1992). For this analysis the samples of children in regular classrooms and children in special schools were pooled, because previous analyses showed no interaction effect between time and group, and no differences in methods used. Table 6 displays the correlations between strategies and progress in behavioral problem areas.

Positive behavior reinforcement and offering emotional support were the pedagogical strategies that correlate most strongly with amelioration of behavioral problems within the six areas of problem behavior where progress was found. Significant correlations were all positive with effect sizes (*r*) ranging from medium (around .30) to strong (*r* = .45). Significant positive correlations with medium effect sizes were further found between structuring (learning) environment and a decrease of inattentive behavior (*r* = .29), and between reinforcement of social and communicative behavior and a decrease of impulsive/hyperactive behavior (*r* = .33).

Results reveal no significant correlations between emphasis of types of academic instruction and progress in text reading accuracy, reading comprehension, spelling, and mathematics. However, we did find that using concrete instructions (*r* = .28, *p* = .025) and repetition of assignments and instructions (*r* = .33, *p* = .008) had a positive influence on reducing inattentive behavior.

Table 6
Correlations between Difference Scores Behavioral Functioning and Pedagogical Strategies (N = 64)

	Structuring (learning) environment	Positive behavior reinforcement	Offering emotional support	Reinforcement of social and communicative behavior
Problem Behavior				
Somatic complaints	.18	.22	.05	.13
Social problems	.30*	.35**	.45**	.01
Thought problems	.17	.21	.27*	.05
Attention problems	.23	.32**	.26*	.24
ADHD Symptoms				
Inattentive	.29*	.27*	.26*	.18
Impulsive/ hyperactive	.13	.13	.02	.33**

* $p < .05$ (two-tailed), ** $p < .01$ (two-tailed)

Discussion

Our study documents and compares academic and behavioral progress of children displaying substantive ADHD behaviors in special schools and in inclusive education after one year of receiving special educational support. As far as we know such a comparison within this population has never been conducted so far. Also, relations between progress

and the use of common pedagogical strategies were analyzed.

As we expected, results indicate that children in both settings made significant progress in behavioral functioning showing a decrease of ADHD-disorder specific problem behavior. Regarding non-disorder-specific problem behavior, we found a trend towards a decrease of physical complaints, thought problems, and social problems. The decrease of internalizing problems such as physical complaints and thought problems does not seem directly related to ADHD, in view of the fact that the symptoms of the disorder are mainly externalizing. However, Jensen et al. (1997) found that comorbid internalizing symptoms were observed relatively frequently in children with ADHD, with percentages ranging from 13 to 50 percent. Regarding academic achievement, we found a significant increase on all measured curricular areas, but the increase rate was not in line with the academic achievement standards set for children with an IQ in the normal range. This implies that the children in the sample did make academic progress, but still underachieved in relation to their level of ability. These results correspond to previous research on academic outcomes of children with ADHD showing that underachievement is common in this population when IQ is controlled for (Diamantopoulou, Rydell, Thorell, & Bohlin, 2007), or when children with ADHD are compared with typically developing peers matched by intelligence (Barry et al., 2002).

No significant differences were found between the degrees of progress made by children in the two settings. This outcome was not expected, and suggests that for this particular group of children school environment does not account for differences between settings regarding improvement of behavioral and academic functioning. Unfortunately, no studies comparing behavioral and academic progress of children displaying substantive ADHD behaviors in different special educational settings are available as yet, so our findings can not be validated against previous studies on this specific topic. However, some studies have been conducted on progress of children with learning disabilities and behavioral disorders in general in special educational settings, which presumably included children with ADHD. Unlike our study, these studies did find differences in development between children across settings, although the results were not conclusive. For instance, a four-year follow-up study by Peetsma, Vergeer, Roeleveld, and Karstens (2001) revealed no differences in psychosocial development between children with learning and behavioral disorders (LBD) in inclusive education and in special schools, but stronger cognitive gains were found for children with LBD in inclusive education. Schneider and Leroux (1994) found that children with behavioral disorders in special classes showed higher academic achievement, but less improvement in self-concept than children with behavioral disorders in inclusive classrooms.

We examined the influence of common pedagogical strategies used for children displaying substantive ADHD behaviors in the daily classroom practice of special educational settings by studying relations between progress and the extent to which these

strategies were emphasized. *Positive behavior reinforcement* and *offering emotional support* were the strategies most closely correlated with a decrease in problem behavior. Concerning positive behavior reinforcement, this result is in line with extensive previous research into the effectiveness of interventions based on this strategy which aim at reducing problem behavior in children with ADHD (e.g., Fabiano et al., 2010; Owens et al., 2005). On the other hand, the relative importance of offering emotional support in the treatment of children with primarily externalizing behavior is somewhat less obvious, but similar results were also found in other studies. For example, Scholte, Van Berckelaer-Onnes, and Van der Ploeg (2007) examined emotional and behavioral development of children with ADHD in after-school day treatment centers and reported a reduction of ADHD symptoms at follow-up only when the emphasis on behavioral control was combined with expressing emotional support.

Contrary to our expectations, comparisons between educational settings indicated no differences in the extent to which pedagogical strategies were used. There has been only one other study on examining differences between educational settings regarding the use of pedagogical strategies in the support of children with ADHD. Reid, Maag, Vasa, and Wright (1994) compared children with ADHD who receive special educational support with children with ADHD who did not receive this support. They found that special education teachers used common pedagogical techniques such as individualized instructions and behavior modification more often than teachers in regular education. A possible reason for our results differing from those of Reid et al. (1994) is that there the regular school teachers, as opposed to the regular teachers in our study, were not coached by professionals from special educational services. As a consequence these teachers may not have had the same level of knowledge of ADHD or of the techniques available to serve children with ADHD as the special education teachers in the study. Reasons given by Reid et al. (1994) for finding differences in the use of pedagogical strategies included the higher academic performance levels of the children with ADHD in regular education in their sample, and possible differences in behavior and severity levels between settings. We did not find such inequality in our study which could explain the absence of differences between settings in the use of pedagogical strategies.

Limitations of Our Study

There are some considerations and cautions to bear in mind in the interpretation of our study results. First, a factor that could have influenced the outcomes but was not controlled for in the study is medication use. Although the percentage of children who received psychotropic medication did not differ between settings, it remains a factor to take into account. However, the extent to which it could influence the outcomes is unclear, because some study findings indicate that the effect of medication use on a decrease in

behavioral problems is larger than on an increase in academic achievement, which is often minimal (Barnard et al., 2010; DuPaul & Stoner, 2003; Miranda et al., 2002).

Second, although the children in the sample displayed substantive ADHD behaviors, only a part (~ 36 %) were formally diagnosed with ADHD. As a result, there are limitations to the homogeneity of the sample and the generalizability of the findings to children who are diagnosed with the disorder. The generalizability of our findings regarding academic achievement might be less affected by this, because research on academic and educational outcomes has shown that children with behavior typical of ADHD, such as inattention, hyperactivity, and impulsivity, were no different regarding the degree of progress and poor academic achievement from children with a formal ADHD diagnosis (Loe & Feldman, 2007; Merrel & Tymms, 2001).

Third, the kind of specific pedagogical strategies and the extent to which these are emphasized in the support provided to children with ADHD can not be obtained in great detail via the PMQ. Since the goal of this study was explorative by nature, i.e., getting a first impression of the pedagogical strategies used in the support of children displaying substantive ADHD behaviors in special educational settings and the relation with progress, the use of an exploratory questionnaire seemed acceptable. In future research, however, it would be important to use an instrument which for example could measure the kind of emotional support offered in more detail, because providing emotional support was found to be an effective treatment strategy.

Fourth, to reduce the number of factors influencing developmental gains we ensured that children in both settings did not differ significantly on several relevant variables. However, because our study was conducted in a natural setting children in the sample could not be randomly assigned to settings and no control group could be used. Other factors, such as unmeasured teacher, parent or family factors, could also have influenced the outcomes. Therefore, the fact that we found no differences in progress outcomes between children in different special educational settings must be interpreted within this limitation and needs to be further confirmed in future studies. A related caution concerns the sample size. Although our overall results were quite conclusive, it is possible that some effects were not detected in our study due to the small number of children in both settings. For example, at pre-assessment the differences between settings regarding Anxious/Depressed, Rule-breaking behavior, and Inattentive behavior were almost significant with p-values < 0.10. Future studies with larger sample sizes are needed to explore this possibility.

Future Directions

With regard to teacher factors, future studies should consider incorporating measures of teachers' knowledge of ADHD and experience with teaching children with ADHD. We expect these factors to influence progress outcomes because they have been found to

correlate with positive attitudes towards including children with disabilities in regular classrooms (Huang & Diamond, 2009). Positives attitudes can in turn have a favorable effect on academic and behavioral outcomes of children with ADHD in a classroom setting (Sherman, Rasmussen, & Baydala, 2008).

Future research may also benefit from including additional important variables. Because we had to make a selection of instruments and variables for our study, not all relevant variables with respect to developmental gains in a school setting were included in the analyses. Therefore, apart from academic achievement, and general and disorder-specific problem behavior, researchers should consider including well-defined comorbidity such as learning disabilities or oppositional defiant disorder (ODD), and measures of social adjustment.

Finally, a particularly interesting aspect in the study of progress outcomes of children with ADHD is the distinction between subtypes. Three subtypes of ADHD are distinguished: predominantly inattentive type, predominantly hyperactive-impulsive type, and combined type (APA, 2000). Apart from symptomatology they also differ in the prevalence of comorbid problems. For instance, academic underachievement is related to all three subtypes, but is more prevalent in the inattentive and combined subtypes than in the hyperactive-impulsive subtype (Diamantopoulou et al., 2007; Merrel & Tymms, 2001), and the inattentive subtype has a greater chance of underachieving in the long term than the other subtypes (Massetti et al., 2008). Furthermore, aggressive behavior, impairments in social interaction, and peer rejection are more often observed in children diagnosed with the hyperactive-impulsive and combined subtypes than in children with inattentive subtype (Barkley, DuPaul, & McMurray, 1990; Carlson & Mann, 2000; Milich, Balentine, & Lyman, 2001). As a consequence, Barkley et al. (1990) found differences in special educational placement between ADHD subtypes in the United States. Children with inattentive subtype received a learning disabled school placement more frequently than children with hyperactive-impulsive behavior, who in turn were placed in behavior disorders schools more often. In addition, Massetti et al. (2008) reported a higher use of special educational services by children with inattentive subtype compared to the other two subtypes. All in all, differences in subtypes and comorbid problems result in a rather heterogeneous population with a diversity of special educational needs. In view of this, we expect different outcomes to be found for children with different ADHD subtypes. Unfortunately, we were unable to examine this hypothesis in this study due to the small sample size. Distinguishing between ADHD subtypes will be a relevant approach for future research concentrating on progress in special educational settings.

Practical Implications

Our findings suggest that offering emotional support is an important pedagogical strategy to improve behavioral functioning of children with ADHD in an educational setting.

Educators and program makers should therefore consider including emotional support when designing interventions for children with ADHD or put more emphasis on this strategy when it is used along side other strategies.

The findings that children with ADHD in both special educational settings underachieve in relation to their cognitive abilities, and make less progress than typically developing peers so that they fall farther behind, are of considerable concern. Therefore, more attention for effective interventions and learning support strategies is necessary to enhance academic achievement. In addition, systematic monitoring of academic performance in core curricular areas, but also of behavioral functioning, can offer crucial information that can be used to provide well-timed and support tailored to the special educational needs of these children.

Conclusions

Children with ADHD show improvement in behavioral and academic functioning in special schools as well as in regular classrooms, indicating that they make parallel progress. However, academic achievement remains an aspect of concern. A combination of positive behavior reinforcement and emotional support seemed the most effective approach to improving behavioral functioning. More research is necessary to confirm our findings and should be aimed, amongst other aspects, at examining developmental progress across different special educational settings for different ADHD subtypes.

Behavioral and Academic Progress of Children with High-Functioning Autism Spectrum Disorders in Special Education: A One-Year Follow-up

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Abstract

This study explored differences in behavioral and academic progress between children with high-functioning autism spectrum disorders (HFASD) (mean age of 9.6 years) in special schools (*n* = 38) and in inclusive education (*n* = 24). In addition, the contribution of common pedagogical strategies to positive outcomes was examined. Measurements used were the Teachers' Report Form, the Social Emotional Questionnaire, assessments of academic performance, and the Pedagogical Methods Questionnaire. Mixed model ANOVA's indicated that children with HFASD in both settings made significant progress regarding social problems, attention problems, autistic behavior, and in all academic areas measured. No interaction effect between time and group was found which suggests that children in both groups made parallel progress. Although academic progress was made, children in both settings still underachieved in relation to their cognitive abilities. Offering emotional support showed the strongest association with behavioral progress.

Introduction

Children with autism spectrum disorders (ASD) experience pervasive qualitative impairments in the area of social skills and communication, and display restricted interests and repetitive and stereotyped patterns of behavior (American Psychiatric Association (APA), 2000). ASD corresponds to pervasive developmental disorder (PDD) as described in the Diagnostic and Statistical Manual of Mental Disorders, fourth edition – text revision (DSM-IV-TR; APA, 2000), and encompasses the broader spectrum of autistic disorder, Asperger syndrome, and Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS). In this article, the term ASD is used when describing published research where no differentiation between ASD-types was made or where the level of ASD characteristics was not made explicit.

The characteristic symptoms of ASD can put up barriers to function optimally in an educational setting on a social, communication, behavioral, and cognitive level. A variety of academic difficulties are observed in children with ASD such as having trouble transitioning between tasks and organizing tasks, motor difficulties, difficulties with written expression and abstract reasoning, slow work pace, disengagement, and problems initiating, sustaining, or maintaining relationships with classmates (e.g. Church, Alisanski, & Amanullah, 2000; Harrower & Dunlap, 2001). As a consequence, children with ASD generally require special educational support (Bitterman, Daley, Misra, Carlson, & Markowitz, 2008; Renty & Roeyers, 2005).

Regarding the use of special educational support, children with high-functioning ASD (HFASD) (intelligence level > 70) are a particularly heterogeneous population. Because of their cognitive abilities they can be considered for placement in more restrictive environments, such as a resource classroom or a special school, as well as in a regular classroom with special educational support (inclusive education). During the last decade, the number of children with HFASD who are enrolled in regular schools and use special educational services is increasing (Chakrabarti & Fombonne, 2001; Williams-White, Scahill, Klin, Koenig, & Volkmar, 2007). The considerable effort most countries made or continued to make to provide special education for children with disabilities in the least restrictive environment (LRE) is likely to be one of the causes for this. The LRE for students with disabilities is the school environment where they can be educated with typically developing peers of the same age to the maximum extent appropriate (McLeskey, Landers, Williamson, & Hoppey, 2012). Full inclusion in a regular classroom is the most ideal situation in this respect. Advocates of inclusive education suggest that being in the presence of typically developing peers improves generalizability of skills, and social and communicative functioning, but also increases academic performance (Harris, Handleman, Kristoff, Bass, & Gordon, 1990; Hunt, Farron-Davis, Beckstead, Curtis, & Goetz, 1994). Advantages of more restrictive environments are thought to be the provision of more

intensive individual attention and specialized support, and a lower likelihood of social exclusion (Landrum, Tankersley, & Kauffman, 2003; Mesibov & Shea, 1996).

Because children with HFASD can receive special educational support in various settings and the number of children with HFASD in regular schools is increasing, it is important to examine the extent to which developmental progress might be differentially influenced by setting. Such knowledge improves our understanding of learning environments that best attune to the needs and abilities of children with HFASD, and can be considered in decisions about special educational placement in the least restrictive environment (Charman et al., 2004; Mesibov & Shea, 1996; Simpson, De Boer-Ott, & Smith-Myles, 2003; Smith-Myles & Simpson, 2002). Parents generally have a major voice in these decisions. However, studies have shown that choices between special educational settings are often based on parental preferences and beliefs about the extent to which such settings can provide proper support and about the social impacts on their child (e.g. Bennet & Deluca, 1997; De Boer, Pijl, & Minnaert, 2010; Kasari, Freeman, Bauminger, & Alkin, 1999; Leyser & Kirk, 2004), rather than on information about developmental prospects. This also seems to be the case in the Netherlands where a comparative assessment by parents has to be made between placement in a special school or in inclusive education, and where placement decisions are partly guided by prejudices against special schools and in favor of inclusive education, and vice versa (De Greef, & Van Rijswijk, 2006). In order to enable both parents and professionals to make well informed placement decisions, it is important that they have information at their disposal about developmental progress in special educational settings varying in restrictiveness.

However, studies examining developmental progress in special education of children with HFASD or ASD in general are rare, in particular across settings. Only two studies were found that focus on progress across special educational settings. Harris et al. (1990) monitored language development of pre-school children in special schools and inclusive education. They reported that in both settings children with ASD made progress regarding language skills, but no significant difference was found in degree of progress. Waddington and Reed (in press) compared academic performance between children with ASD in inclusive education and in special schools on the basis of national curriculum outcomes, and did not find any difference either in the extent of progress made. Unfortunately, we found no studies concerning progress in behavioral functioning across educational settings. A study of Charman, Howlin, Berry, and Prince (2004) used parental reports to evaluate developmental outcomes in special classrooms only and it was found that children with ASD made progress in adaptive functioning. On the other hand, according to parents, symptom severity, communication, socialization, and daily living skills did not change significantly during one year. Osborne and Reed (2011) examined school factors associated with progress in regular classrooms, and found improvement in

emotional and behavioral difficulties for children with autistic disorder within one school year, and improvement in pro-social behavior of children with Asperger syndrome.

Studies concerning the development of children in special education with learning disabilities and behavioral disorders in general are more common. However, the results are mixed. For instance, a four-year follow-up study by Peetsma, Vergeer, Roeleveld, and Karstens (2001) revealed no differences in psychosocial development between children with learning and behavioral disorders (LBD) in inclusive education and in restrictive environments, but stronger cognitive gains for children with LBD in inclusive education. In contrast, Schneider and Leroux (1994) reported that children with behavioral disorders in special classrooms showed more academic achievement and less improvement in self-concept than children with behavioral disorders in regular classrooms.

Considering how little is known about progress outcomes of children with HFASD in special education, the main aim of our study is to extend current knowledge on this topic. Differences in the degree of progress made between children with HFASD in special schools and in inclusive education were explored in order to contribute to our understanding of learning environments that best anticipate to the needs and abilities of children with HFASD. We focused on progress in two areas: behavioral functioning and academic achievement. Behavioral functioning is included because children with ASD have an increased incidence of behavioral and emotional difficulties (Eaves & Ho, 1997). Attention problems reflected in inattentive and hyperactive symptoms were found to be very common among children with ASD (Ashburner, Ziviani, & Rodger, 2010). Difficulties with emotion regulation such as frustration, stubbornness, and temper tantrums were also frequently reported (Lecavalier, 2006). Furthermore, study findings showed that children with HFASD display more challenging non-disorder specific behavioral problems in the classroom than children diagnosed with autistic disorder (Barnard, Prior, & Potter, 2000; Gadow, DeVincent, Pomeroy, & Azizian, 2005) and typically developing peers (Macintosh & Dissanayake, 2006; Mazefsky, Anderson, Conner, & Minshew, 2011). Considering the academic difficulties described earlier in the introduction, it is also of considerable relevance to monitor if progress is made on an academic level. Although academic achievement is a central factor in the education of children, studies rarely focus on performance in core curricular areas such as reading and mathematics of children with ASD in special educational contexts (Harrower & Dunlap, 2001; Hunt & Goetz, 1997). We therefore also examined differences in achievement in these core curricular areas between children with HFASD in special schools and in inclusive education, and compared the achievement level of children with HFASD to that of typically developing peers. With the examination of progress in behavioral functioning and academic achievement, our study also aims to contribute to further identification of possible areas where additional support or intervention is needed.

Extension of the knowledge base regarding the effects of pedagogical strategies used to support these children in classroom settings is also needed (Ashburner et al., 2010), considering the ever increasing number of children with HFASD who use special educational services, and the findings that many educational treatments and interventions for children with ASD are not evidence based (Hess, Morrier, Heflin, & Ivey, 2008). In this light, Hess et al. (2008) points out that future research should examine and document the nature and types of strategies used in different settings supporting students with ASD. In our study, we attempted to meet this suggestion by exploring the use of common pedagogical strategies by teachers in the daily classroom practice of the two special educational settings and by analyzing relations with positive outcomes. Of particular interest in this respect is the use of emotional support. Offering emotional support is described as a means to relate to the personal part of children by getting emotionally and personally involved (Pianta, Hamre, & Stuhlman, 2003). Study findings show that offering emotional support to children with developmental disorders is positively related to successful school adjustment and a decrease of behavioral and emotional problems (Hamre & Pianta, 2005; Scholte, Van Berckelaer-Onnes, & Van der Ploeg, 2007). However, because of the impairments of children with ASD in the area of social interaction and communication, it is likely that this is a pedagogical strategy that is less emphasized in the support offered to children with ASD.

For the study reported here two research questions were formulated: (1) Do children with HFASD who receive special educational support make behavioral and academic progress, and are there differences between settings with regard to the amount of progress made? (2) Are there differences between settings regarding pedagogical strategies used to support children with HFASD, and which strategies contribute positively to development?

Although the present study was explorative in nature, the following cautious hypotheses were formulated with respect to the outcomes: (1) Children with HFASD in both settings show progress in behavioral functioning and academic achievement. Differences between settings may be that children in special schools make greater progress in behavioral functioning than children with special educational needs in regular classrooms, because the school and classroom environment of special schools is more geared toward special (educational) needs of children with HFASD. We expected no differences between settings in progress in academic achievement, but we did expect that children with HFASD underachieve in relation to their cognitive abilities and make less progress compared to typically developing peers (Ashburner et al., 2010; Waddington & Reed, in press). (2) Concerning pedagogical strategies we hypothesized that in special schools these are emphasized more strongly than in regular schools, because of the lower teacher-student ratio. Providing a special pedagogical climate is generally also a more intrinsic aspect of daily practice in special schools. We expected strategies aimed at

structuring the learning environment to relate to positive development the most, along with offering emotional support – a strategy that promotes teacher-student bonding (Hamre & Pianta, 2005; Scholte, Van Berckelaer-Onnes, & Van der Ploeg, 2007).

Method

Procedure

Data collection took place at schools for special education and regular schools that provide support for children with special educational needs (inclusive education) in an urban part of the Netherlands. Since 1998, special education in the Netherlands consists of four different clusters with their own area of expertise regarding teaching and caring for children with severe disabilities. Cluster 1 offers special education for the visually impaired (1 % of all children within special education), Cluster 2 for the hearing impaired and/or children with serious speech and language problems (14 %), Cluster 3 for children with cognitive and/or physical disabilities (41 %), and Cluster 4 for children with emotional and behavioral disorders (including children with ASD) (44 %) (CBS: Central Bureau of Statistics, 2009). In order to be eligible for special education an independent committee decides if a child meets the cluster specific admission criteria designed by the Dutch government. The admission criteria of the service sector for children with ASD consist of three parts: (1) a developmental, behavioral and/or emotional disorder according to the Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition, Text Revision (DSM-IV-TR; APA, 2000) accompanied by (2) serious impairments to attain regular education which (3) the continuum of regular educational care can not provide without additional services (Ministerie van OCW [Ministry of Education], 2006). Examples of serious impairments are relational problems with classmates and/or teachers, to be a danger to others and/or oneself, and severe motivational and attention problems. In general, serious impairments are assessed by a qualified clinician conducting cognitive, learning, and/or behavior tests. These assessments are supplemented with concrete descriptions of the impairments and difficulties that the child experiences in the classroom, which are provided by the child's teacher. Children who are eligible for special education are entitled to receive special educational support from the cluster that serves their specific disability. What kind of educational setting will provide this support is subsequently decided by parents in consultation with the child's (future) educators. In principal, the Dutch educational system only offers two basic forms of special education, i.e. inclusive education or a special school, thus a choice has to be made between one of two settings. The criteria entail that children who are eligible are quite comparable regarding their special educational needs.

Parents of 4- to 12-year old children who receive special educational support from cluster 4 were requested to participate in the study and to give written informed consent with regard to the provision of information about their children by schools and teachers.

To select the parents, a random sample was taken of seven out of sixteen special schools and of two out of four educational services providing special educational support in regular schools. Special schools connected to residential facilities were excluded from the sample. Subsequently, teachers of the children for whom consent was obtained and school psychologists based at the schools monitoring the development of these children were then asked to fill in relevant questionnaires that could be returned to Leiden University. Questionnaires were filled in either by teachers or by school psychologists depending on the questionnaire. Pre- and post-assessment questionnaires were completed for 180 children with emotional and behavioral disorders. Surveys took place approximately half way through the school year, around spring time (mean interval of 11 months). This results in two different teachers rating children's behavioral functioning and academic achievement, which reduces teacher bias. The responding school psychologist remained the same throughout the assessments.

Participants

The main sample comprised 180 children with various emotional and behavioral disorders that had participated in the pre- and post-assessments. In this sample 62 children were formally diagnosed with ASD according to the DSM-IV-TR criteria by a qualified clinician. These children were selected for this study. Detailed reports about clinical diagnoses and psychometric test information were taken from the school assessment files of the children. Apart from a formal diagnosis, other inclusion criteria for the participants were a score in the clinical range on the subscale 'autistic behaviors' of the *Social Emotional Questionnaire* (SEQ; Scholte, Van Berckelaer-Onnes, & Van der Ploeg, 2008), which provides a measure of severity of autistic behavioral symptoms and verification of the disorder ensuring the homogeneity of the group, and a full-scale IQ of 85 or higher. In this article, we define an intelligence level within one standard deviation from the mean and up as high-functioning.

Two groups were studied: One group of 38 children placed in schools for special education (*Special School*) and one group of 24 children who were fully integrated in regular classrooms where they received special educational support (*Inclusive Education*). Statistics on relevant background variables of children in both settings are displayed in Table 1. Independent sample t-tests showed no differences between settings on any of the variables. Also, the distribution of boys and girls in both settings is approximately similar (89 % boys within *Special School* and 83 % boys within *Inclusive Education*).

There are in principal no distinct differences in teaching materials or curriculum. The special schools and regular schools do not provide for additional treatment such as family support or residential care, and only focus on care related to educational disabilities. In special schools this care is provided by specialized teachers, teacher aides (paraprofessionals), and school psychologists. The typical range of classroom size varies from six to ten children.

Table 1

Differences between Children with HFASD in Special Schools (n = 38) and in Inclusive Education (n = 24) on Background Variables at Time of Pre-assessment

	Spec. School	Incl. Ed.	Test
	M (SD)	*M (SD)*	
Age	9.5 (1.80)	9.6 (1.24)	t = .006; p = .197
IQ	102 (9.88)	103 (10.16)	t = .365; p = .717
Years spent in setting	3.5 (1.21)	3.7 (.96)	t = .869; p = .388
Ethnicity (% Caucasian)	88 %	98 %	χ^2 (1) = 2.84, p = .123
SES % lower education	22 %	9 %	
% secondary education	55 %	37 %	χ^2 (2) = 7.90, p = .052
% higher education	23 %	54 %	

The teachers in regular schools are coached by professionals from special educational services among which are also school psychologists. In addition, children with HFASD in regular classrooms receive support from learning support teachers (either visiting or based at the school). An average regular classroom contains 25 to 30 children. Apart from classroom size, differences between settings mainly concern the school environment. Compared to children in regular schools children in special schools are placed in an ASD-specific setting with a more structured daily program, less stimuli, and special provisions such as adapted physical education and more opportunities to retreat. Unlike children in regular schools they have limited to no opportunity to interact with typically developing peers during school hours.

Measures

Progress in children's functioning during one year was evaluated by pre- and posttest-assessments on multiple measures regarding behavioral and educational development. These assessments occurred for both groups simultaneously. Considering that children with ASD can display non-disorder-specific problem behavior alongside disorder-specific behavior (Mazefsky et al., 2011), progress for both types of behavior was measured separately.

The scale 'autistic behaviors' of the SEQ was used to measure autistic symptoms. With the SEQ the presence of symptoms according to the DSM-IV-TR criteria of four of the most common developmental disorders in childhood can be assessed, that is Attention Deficit Hyperactivity Disorder, Anxiety – and mood disorder, Autistic behaviors, and Oppositional-Defiant Conduct Disorder. Teachers rated the presence of symptoms of these disorders by answering 72 questions on a five-point scale (1 = not at all, 2 = sometimes/incidentally, 3 = regularly/monthly, 4 = often/weekly, 5 = very often/daily). Examples of test items regarding autistic behaviors are 'Experiences difficulties when

transitioning between tasks', 'Shows anxiety for no apparent reason', and 'Finds it difficult to understand and relate to feelings and viewpoints of other people'. Psychometrics all meet the requirements for tests for diagnostic purposes (Nunnaly & Bernstein, 1994). The internal consistency of the subscales is measured with Cronbach's alpha (α), and was found to be between 0.80 and 0.96. The test-retest reliability and inter-rater reliability were measured by computing interclass correlations (*r*) between the first and second measure, and resulted in coefficients above 0.75 and above 0.73 for all subscales respectively. In this study the raw scores of the scale 'Autistic behavior' were used to measure the severity of autistic symptoms that are specific for autism spectrum disorders.

The Dutch version of the *Teachers' Report Form* (TRF; Verhulst, Van der Ende, & Koot, 1997) was used to obtain non-disorder-specific problem behavior as perceived by the child's teacher. The TRF provides a total scale score (Total Problems), two broad band scale scores (Internalizing Problems and Externalizing Problems), and eight narrow band subscale scores (Withdrawn/Depressed, Somatic Complaints, Anxious/Depressed, Social Problems, Thought Problems, Attention Problems, Rule-breaking Behavior, and Aggressive behavior). Teachers rated the behavioral and emotional problems by answering 118 questions with a response set (0 = not true, 1 = sometimes true, 2 = very true or often true). With regard to the Dutch version of the TRF, satisfactory psychometric characteristics were reported (internal consistency > 0.87, test-retest reliability > .81, inter-rater reliability > 0.60) (Verhulst et al., 1997). The raw scores of the narrow band subscales were used in the present study to measure severity of the non-specific behavioral problems.

Academic achievement on text reading accuracy, reading comprehension, mathematics, and spelling was measured by means of the method recommended by the Dutch Ministry of Education to assess educational achievement annually (CITO: Central Institute for Test Development, 2009). The assessment battery consists of tests for reading, spelling, and mathematics, and gives the performance level of students in terms of months of education. Ten months equals one school year. The performance level can also be compared to a norm group of peers in order to determine if a child is behind, on the same pace, or ahead of other children of the same age and school type. The tests all meet the psychometric requirements of tests for diagnostic purposes with a Cronbach's alpha of 0.83 or higher for the subscales on reading, 0.86 or higher for the subscales on mathematics, and 0.87 or higher for the subscales on spelling (CITO, 2009). IQ scores were obtained from diagnostic reports in the school assessment files of the children. The *Wechsler Intelligence Scale for Children-Revised* (WISC-R; Van Haasen et al., 1986) was used to measure intelligence.

To explore pedagogical strategies used in the classroom to improve children's' functioning, school psychologists were asked to fill in the *Pedagogical Methods Questionnaire* (PMQ). With this inventory list respondents can indicate to what extent

teachers emphasize common pedagogical strategies used for children with HFASD in their daily classroom support. The use and emphasis on these strategies are instructed and coordinated by the school psychologists, and are registered in Individualized Education Programs (IEP's). Assessments take place on four-point scales (1 = no emphasis, 2 = small emphasis, 3 = medium emphasis, 4 = large emphasis). Four strategies aimed at behavioral and emotional functioning were included, namely (a) Structuring of (learning) environment (e.g. using picture activity schedules and timers, contingency management, screening off workplace), (b) Positive behavior reinforcement (e.g. praising desired behavior and ignoring negative behavior, using preferred items as a reward), (c) Offering emotional support (e.g. emphasizing individual qualities, showing understanding and compassion, building trust), and (d) Reinforcement of social and communicative behavior (e.g. peer mediation, modeling, cognitive re-labeling of situations and social interactions, language comprehension). These common strategies are based on literature about intervention and treatment of children with ASD (e.g. Iovannone, Dunlap, Huber, & Kincaid, 2003; Ozonoff & Schetter, 2007; Volkmar, Paul, Klin, & Cohen, 2007). To get an indication of the intensity of support given to children regarding academic performance, three PMQ items were used: (e) providing individual instruction, (f) using concrete instructions, and (g) repetition of task assignments and instructions. The reliability of this instrument was determined in a separate study where the PMQ was filled in by the same raters within three weeks (test-retest reliability). Intra-class correlations of 0.80 and above were found between both PMQ measurements (Scholte, Van Berckelaer-Onnes, & Van Oudheusden, 2007), suggesting sufficient test-retest reliability (Nunnaly & Bernstein, 1994).

Data Analysis

To conduct the statistical analyses, IBM SPSS Statistics 19 was used. First, to determine if children in both settings are comparable at the time of pre-assessment, differences between children with HFASD in special schools and in inclusive education on the pre-assessment measures concerning behavioral functioning and academic achievement were examined with several independent sample *t*-tests. Given the number of *t*-tests conducted, a Bonferroni correction was applied to the analyses, resulting in an adjusted significance level of $p < .005$ for the measures of behavioral functioning and $p < .013$ for the measures of academic achievement.

Second, progress in behavioral functioning and academic achievement during one year of special educational support was analyzed with 2 (Setting: Special School vs. Inclusive Education) x 2 (Time: Pre- and Post-assessment) mixed-model ANOVA's. Developmental progress is indicated by a significant main effect of Time (within-subject factor) for a specific outcome variable, meaning that progress has been made within subjects on that variable regardless of setting. A main effect for Setting (between-subject factor) indicates that a difference in mean scores exists between children with ASD in

specials schools and in inclusive education regardless of time. When an interaction between Time and Setting is found, this indicates that the degree of progress was different for children with HFASD in special schools compared with inclusive education. To define the magnitude of the effect, partial eta squared (η^2_p) is reported (small effect: η^2_p ~ 0.03; moderate: η^2_p ~ 0.06; large: $\eta^2_p \geq 0.14$) (Stevens, 1986). The adopted significance level after Bonferroni correction was $p < .005$ for the measures of behavioral functioning and $p < .013$ for the measures of academic achievement.

Finally, exploratory correlational analysis were conducted with Pearson's correlations (r) to examine which strategies of the PMQ relate to behavioral and academic growth, measured as difference scores between pre- and post-assessment on the behavioral and academic measures.

Results

Preliminary Analysis

In order to make valid comparisons between children in both settings, pre-assessment measures should not differ significantly between settings. Results of independent sample t-tests for comparisons between children in special schools and children in inclusive education on TRF subscales, the subscale 'autistic behavior' of the SEQ, and subscales measuring academic achievement at times of pre-assessment are presented in respectively Table 2. (Mean scores and standard deviations can be found in Tables 3 and 4.)

No significant differences were found for any of the variables. This implies that, at the start of the study, children in both settings had comparable behavioral and academic needs, and therefore internally valid comparisons can be made between both settings with regard to behavioral and academic progress.

Behavioral Functioning

Mean scores and standard deviations at the time of pre- and post-assessment for children in special schools and in inclusive education separately are shown in Table 3. Results of the mixed model ANOVA on each variable measuring behavioral functioning are presented in the last three columns which represent the main effects for setting and time, and the interaction effect between setting and time.

A significant main effect for time was found regarding social problems (F [1,60] = 11.06, p = .002, η^2_p = .16), attention problems (F [1,60] = 9.63, p = .003, η^2_p = .14), and autistic behavior (F [1,60] = 12.79, p = .001, η^2_p = .18). This indicates that the problem scores on these subscales decreased significantly within subjects during approximately one year in either setting. However, no significant interaction effect between time and setting for any of these variables was found. This suggests that children with HFASD in special schools and in inclusive education made parallel progress regarding these variables.

Table 2

Results of Independent Samples t-tests between Children with HFASD in Special Schools (n = 38) and in Inclusive Education (n = 24) on Behavioral Functioning, Autistic Behavior, and Academic Achievement

	t	*p*
Behavioral Functioning		
Withdrawn/ depressed	-1.49	.140
Physical complaints	-.66	.510
Anxious/ depressed	-1.67	.099
Social problems	-1.54	.130
Thought problems	-.39	.700
Attention problems	.42	.679
Delinquent behavior	-1.58	.119
Aggressive behavior	-1.41	.164
Autistic Behavior		
SEQ-autistic behavior	1.15	.255
Academic Achievement		
Reading accuracy	.34	.732
Reading comprehension	-1.23	.228
Spelling	-1.31	.199
Mathematics	.47	.638

Academic Achievement

Mean scores of academic achievement for each subject and standard deviations at the time of pre- and post-assessment for children in special schools and in inclusive education separately are shown in Table 4.

Only a significant main effect for time was found regarding all areas of academic achievement: text reading accuracy (F [1,60] = 11.43, p = .002, η^2_p = .25), reading comprehension (F [1,60] = 12.23, p = .001, η^2_p = .28), mathematics (F [1,60] = 69.47, p = .000, η^2_p = .38), and spelling (F [1,60] = 22.99, p = .000, η^2_p = .32) indicating that the children with ASD in the sample made significant progress on these subjects within approximately one year. The absence of a significant interaction effect suggests that children with HFASD in special schools do not differ from children with HFASD in inclusive education regarding the degree of progress that is made in academic achievement.

However, at the time of pre-assessment, children in both special schools and in inclusive education were already lagging behind on all subjects. On text reading accuracy they were on average 5.6 months behind (SD = 6.47), on reading comprehension 3.7 months behind (SD = 5.49), on mathematics 4.4 months behind (SD = 5.54), and on spelling 7.6 months behind (SD = 8.43). No significant differences were found between settings regarding the mean number of months that children were behind (p > .05). Furthermore,

the difference scores between pre- and post-assessment show that the children did not make the expected typical progress of 10 months within a school year on almost all of the subjects, indicating an increase in the number of months they were behind. In other words, they made significant progress on all subjects, but this progress was not enough to make up any arrears. In any case, they were falling farther behind.

Table 3

Progress in Behavioral Functioning and Autistic Behavior of Children with HFASD in Special Schools (n = 38) and in Inclusive Education (n = 24) during a 1-year Follow-up

	Pre-assessment		Post-assessment		Effects		
	Spec. School	Incl. Ed.	Spec. School	Incl. Ed.	Setting	Time	Setting x Time
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*F*	*F*	*F*
Behavioral Functioning							
Withdrawn/ depressed	6.00 (3.37)	4.58 (4.01)	5.42 (3.56)	4.08 (3.60)	2.89	1.27	< 1
Physical complaints	0.68 (1.04)	0.50 (1.10)	0.32 (0.81)	0.46 (0.83)	< 1	1.73	1.10
Anxious/ depressed	8.64 (6.40)	6.73 (4.06)	8.92 (6.43)	5.13 (4.14)	2.35	2.96	< 1
Social problems	6.24 (4.24)	4.71 (3.01)	4.95 (4.32)	2.92 (2.00)	4.38	11.06*	< 1
Thought problems	2.89 (2.48)	2.67 (1.86)	2.24 (2.28)	2.08 (1.67)	< 1	5.22	< 1
Attention problems	16.97 (7.57)	17.79 (7.51)	14.95 (7.76)	13.92 (8.35)	< 1	9.63*	< 1
Delinquent behavior	1.76 (2.22)	0.92 (1.74)	2.05 (2.29)	1.38 (1.79)	2.30	3.34	< 1
Aggressive behavior	14.50 (11.83)	10.54 (8.82)	15.11 (12.88)	9.04 (10.49)	3.16	< 1	1.21
Autistic Behavior							
SEQ-autistic behavior	13.18 (6.27)	15.04 (6.08)	9.43 (6.85)	11.58 (5.36)	2.81	12.79*	< 1

* $p < .005$ (adjusted significance level after Bonferroni correction)

Table 4

Progress in Academic Achievement of Children with HFASD in Special Schools (n = 38) and in Inclusive Education (n = 24) during a 1-year Follow-up

	Pre-assessment		Post-assessment		Effects		
	Spec. School	Incl. Ed.	Spec. School	Incl. Ed.	Setting	Time	Setting x Time
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*F*	*F*	*F*
Text reading accuracy	22.86 (14.78)	19.67 (10.50)	29.79 (15.05)	23.00 (13.66)	<1	11.43*	1.40
Reading comprehension	30.95 (12.89)	25.92 (11.41)	40.76 (17.23)	32.17 (10.03)	2.36	12.23*	< 1
Mathematics	23.23 (15.44)	24.31 (11.56)	31.03 (15.79)	30.23 (11.90)	<1	22.99*	< 1
Spelling	23.38 (13.14)	19.46 (8.83)	28.88 (17.17)	27.85 (15.24)	<1	69.47*	1.31

* $p < .013$ (adjusted significance level after Bonferroni correction)

Support Strategies Related to Behavioral Functioning and Academic Achievement

First, with independent sample *t*-tests it was determined if children in both settings differed with regard to the extent in which pedagogical strategies were used. Bonferroni correction was applied for multiple comparisons, resulting in an adjusted significance level of $p < .007$. Results indicated that there were no differences between settings in this respect (see Table 5), meaning that in both settings all strategies were equally emphasized. To enhance behavioral functioning, structuring of the learning environment and reinforcement of social and communicative behavior were emphasized the most in both settings, and offering emotional support the least. Using concrete instructions was emphasized the most to increase academic achievement.

Table 5

Results of Independent Sample t-tests between Children with ASD in Special Schools and in Inclusive Education Reflecting the Emphasis on Pedagogical Strategies Used

	Special school (*n* = 38)	Inclusive education (*n* = 24)		
	M (SD)	*M(SD)*	*t*	*p*
Behavioral Functioning				
(a) Structuring (learning) environment	3.51 (.80)	3.61 (.58)	.493	.624
(b) Positive behavior reinforcement	3.22 (.67)	3.17 (.78)	-.223	.824
(c) Offering emotional support	3.16 (.55)	3.00 (.79)	-.930	.356
(d) Reinforcement of social and communicative behavior	3.59 (.55)	3.48 (.67)	-.734	.466
Academic Achievement				
(e) providing individual instruction	2.87 (.95)	2.78 (.95)	-.345	.731
(f) using concrete instructions	3.05 (.87)	2.87 (1.01)	-.749	.457
(g) repetition of assignments and instructions	2.92 (.82)	2.61 (.94)	-1.365	.177

Additionally, Pearson's correlations (*r*) were calculated between difference scores of the behavioral problem areas where a significant progress was found and the strategies measured with the PMQ (see Table 6). For this analysis the samples of children in inclusive education and children in special schools were pooled, because previous analyses proved no interaction effect between time and setting, and no differences in methods used. Table 6 shows the strategies that were found to correlate with progress in social problems, attention problems, and autistic behavior.

Of the three selected aspects of problem behavior, offering emotional support to children with HFASD correlates most strongly with amelioration of behavioral problems. The significant correlations found were all positive with medium effect sizes (*r*) around .30. Significant positive correlations with medium effect sizes were further found between structuring of the (learning) environment and a decrease of social problems ($r = .33$), and between reinforcement of social and communicative behavior and a decrease of autistic

behavior (r = .26). No significant relations were found between improvement in behavioral functioning and positive behavior reinforcement.

Table 6
Correlations between Difference Scores Behavioral Problem Areas and Pedagogical Strategies (N = 62)

	Social problems	Attention problems	Autistic behavior
Structuring (learning) environment	.33**	.10	.15
Positive behavior reinforcement	.18	.10	.09
Offering emotional support	.30*	.31*	.31*
Reinforcement social and comm. behavior	.21	.03	.26*

* $p < .05$, ** $p < .01$

Also, Pearson's correlations (r) were calculated between difference scores of all areas of academic achievement and the PMQ items reflecting type of academic instruction (items e, f, and g). Again, the samples of children in both settings were pooled. Only a significant correlation was found between *repetition of task assignments and instructions* and progress in comprehensive reading (r = .38, p = .028). Extra support for text reading accuracy, spelling, and mathematics did not significantly relate to progress in these academic areas.

Discussion

The current study documents and compares behavioral and academic progress, in particular in core curricular areas, of children with HFASD in special schools and in inclusive education. Also, relations between progress and the use of common pedagogical strategies were analyzed. The results add to our limited knowledge about developmental progress of children with HFASD in various special educational settings, provide leads for future research, and contribute to our understanding of learning environments that best attune to the needs and abilities of children with HFASD. Such information can be considered in decisions about special educational placement in the least restrictive environment and can be used to improve interventions.

Results indicate that children in both settings made significant improvements within one year showing a decrease in severity of autistic behavior, social problems, and attention problems. This is a particularly positive outcome, because Mazefsky et al. (2011) found that, together with thought problems, these last two behavioral problems were the most commonly reported among children with HFASD. Scores in the clinical range of the Child Behavior Checklist significantly differentiated these children from typically developing children. Our results are partly comparable to those found in previous research. For example, Arick et al. (2003) and Osborne and Reed (2011) also found progress regarding

emotional and behavioral difficulties, and behaviors associated with ASD. On the other hand, aside from an improvement in adaptive functioning, Charman et al. (2004) reported no decreases in symptom severity, communication, and socialization.

Regarding academic achievement significant progress was found on all measured core curricular areas, but the increase rate did not respond to the academic achievement standards typically set for children with an IQ in the normal range. This implies that although the children with HFASD in the sample made progress in these areas, they underachieved in relation to their cognitive abilities. Similar results are reported by Ashburner et al. (2010), who compared children with HFASD in regular classrooms with a mean IQ of 103 with typically developing peers on several developmental aspects, including academic achievement.

No significant differences were found in the degree of progress made between children in both settings regarding behavioral and academic aspects. This outcome was not expected, and suggests that for this particular group of children school environment does not account for differences between settings regarding improvement of behavioral and academic functioning. However, this finding must be interpreted within the limitations of our study design. In order to reduce the number of factors influencing progress, we ensured that children in both groups were comparable on several relevant variables. Also, the Dutch admission criteria for special education entail that children in special schools and in inclusive education are quite comparable regarding their special educational needs. These similarities between groups permitted the use of a quasi-experimental design in a natural setting. Nevertheless, because children in the sample could not be randomly assigned to settings given ethical constraints, it is possible that other factors could have influenced the outcomes such as teacher characteristics, teacher experience with children with ASD, or parental involvement. Therefore, the findings need to be confirmed in a future study in which such factors are incorporated and explored. At present, it can be said that with background variables and studied variables initially similar, these two groups of children made parallel progress.

Apart from behavioral and academic functioning, we examined the influence of common pedagogical strategies used for children with HFASD in the daily classroom practice by studying relations between progress and the extent to which these strategies were emphasized. Results showed that, although least emphasized, offering emotional support correlates significantly and substantially with decrease of symptoms in all three problem areas (social problems, attention problems, and autistic behavior). On the other hand, structuring of the (learning) environment and reinforcement of social and communicative behavior – strategies widely used to ameliorate the attentive, social, and communicative problems of children with ASD – were related only to a decrease in social problems and autistic behavior, respectively. The relative importance of emotional support in the treatment of children with behavioral disorders was also found in other studies.

Hamre and Pianta (2005), for example, found that emotional support offered by teachers played a particularly important role in the positive development of children with a combination of classroom problems such as academic, social, and behavioral problems. Also, Scholte et al. (2007) examined emotional and behavioral development of children with ADHD in a daycare treatment center, and reported a reduction of ADHD symptoms at follow-up only when the emphasis on behavioral control was combined with expressing emotional support.

No significant relation was found between behavioral progress and positive behavior reinforcement. This suggests that this particular strategy appears to be less relevant in supporting children with HFASD in special educational settings at this specific age and developmental stage.

Limitations and Future Directions

Apart from the limitation mentioned above, there are some other considerations and cautions that bear on the interpretation of our study results. First, to measure severity of autistic behavior an instrument (SEQ) was used that gives a global indication of the possible presence of an ASD. Therefore change in symptom severity could not be determined at the level of separate symptom-specific aspects. To explore changes in severity in greater detail an instrument that measures these symptom-specific aspects should be used in future research. The same holds for the questionnaire (PMQ) that was used to get an indication of the extent in which pedagogical strategies are emphasized in the support provided to children with ASD in a special educational setting. Since the goal of this study was explorative in nature, that is, aimed at getting a first impression of the relation between teacher support strategies often used in special educational settings and developmental gains, the use of an exploratory questionnaire was acceptable. In future research however, it would be important to use an instrument by which, for example, the kind of emotional support offered could be measured in more detail, because we found the use of this strategy to be a positive factor in the development of these children. Also, to increase the validity of the data obtained with the PMQ, independent observations should be conducted in the classroom in addition to the school psychologist's ratings.

Second, due to the Dutch educational system we were only able to compare progress outcomes between two types of special education, namely full inclusive education and a special school. Progress outcomes for children with HFASD who attend special educational settings in between these two extremes could not be collected, which limits the generalizability of the findings. Therefore, future studies should include samples of children enrolled in a larger variety of settings within the special educational continuum. Although a consequence of the aim of our study, another limitation to the generalizibility concerns the inclusion of children with HFASD only. It would be an interesting direction for

future research to examine whether the same results would be obtained for children with ASD with an intelligence scores below the average range.

An adjoining recommendation for future research concerns examining indicators that differentiate between children with HFASD that require more or less restrictive learning environments. In our study we were interested in the extent to which special educational settings differentially influence progress outcomes of children with HFASD, and therefore the learning and behavioral profiles of children in both settings were comparable at the time of pre-assessment. Knowing which needs and abilities of children with HFASD might dictate one educational setting or another would also be relevant information to consider in decisions about special educational placement. Earlier studies provide leads for indicators that could be included in future research. Aljunied and Frederikson (2011) report that theory of mind and intelligence discriminated between children with ASD placed in special educational settings differing in support level. In addition, a study of Stoutjesdijk, Scholte, and Swaab (2011), examining characteristics of children with emotional and behavioral disorders that hinder inclusion in regular education, showed that academic performance, relational problems between child and caregiver, and the age at which the child received youth care for the first time were factors that discriminated between children in inclusive education and in special schools.

Implications

The results did not provide evidence for differences in progress outcomes regarding social problems, attention problems, autistic behavior, and academic achievement between a group of children with HFASD in special schools and in inclusive education. This might suggest that equal progress in these areas can be expected in either setting for this specific group of children. For professionals and parents involved in decisions about required special educational services and placement in the least restrictive environment, these findings could therefore implicate that, in terms of progress outcomes, the option of a regular classroom as a suitable learning environment for children with HFASD should receive increased attention. However, considering the limited data in this area, future research is necessary to confirm the findings and shed more light on the issue.

The finding that children with HFASD in both settings underachieve in relation to their cognitive abilities, and make less progress in core curricular areas than typically developing peers, and so fall farther behind, is of considerable concern. Possible reasons for this underachievement mentioned in earlier literature include auditory filter difficulties, sensory under-responsiveness, and sensory seeking (Ashburner et al., 2010), but also the children's experiencing especially regular classrooms as stressful (Humphrey & Lewis, 2008). It is likely that the increased incidence of behavioral and emotional difficulties, among which attention and motivation problems, also contribute to diminished academic achievement. Examples of best practice strategies by which to enhance the learning

potential of children with ASD are the uses of computer-based approaches, along with short periods of structured support preferably preceded by simpler, but related tasks (Parsons, Guldberg, MacLeod, Jones, Prunty, & Balfe, 2011). Despite the expanding knowledge base about disorder-specific characteristics and their underlying causes, and learning-support strategies for children with ASD, academic underachievement remains an important issue in the education of these children. This makes ongoing research in this area highly necessary just as increased attention to this issue in both regular schools and special schools. Frequently monitoring academic performance in core curricular areas is a feasible approach to keep a finger on the pulse so that support can be offered in an earlier stage.

Finally, our findings suggest that offering emotional support is an important pedagogical strategy by which to reduce maladaptive classroom behavior of children with HFASD. Compared to other strategies, however, it is least emphasized in the support provided to these children in the daily classroom practice. As mentioned in the introduction, offering emotional support is described as a means to relate to the personal part of children by getting emotionally and personally involved (Pianta, Hamre, & Stuhlman, 2003). Considering this description, the relatively low emphasis on this strategy in the daily classroom practice is likely the result of the difficulties children with ASD experience in the areas of social interaction and communication. These difficulties make attempts at emotional and personal involvement challenging. However, research has shown consistently that children with ASD are able to form emotional bonds with caregivers and teachers (e.g. Rutgers, Bakermans-Kranenburg, Van IJzendoorn, & Van Berckelaer-Onnes, 2004), and that the quality of the teacher-child relationship is an important predictor of successful school adjustment for children at risk (e.g. Baker, Grant, & Morlock, 2008; Hamre & Pianta, 2005). Together with the findings of the present study, these results underline the importance of emotionally supportive interactions between teachers and children with ASD. Examples of such interactions could include expressing authentic interest and awareness in the child's needs, capabilities, and drives, and anticipate to these individual characteristics within classroom rules and routines (Hamre & Pianta, 2005). Educators and program leaders should therefore consider including emotional support when designing interventions for children with ASD or lay more emphasis on this strategy when it is used along side other strategies.

Impact of Family Functioning on Classroom Problem Behavior of Children with Emotional and Behavioral Disorders in Special Education

5

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Abstract

This study examined the relation between family functioning and classroom problem behavior of children with emotional and behavioral disorders receiving special educational support. To this end, the Teachers' Report Form and the Family Questionnaire were completed for 84 children (*M* age of 9.8 years) two times with a time-lag of 11 months. Cross-lagged path analyses showed that internalizing and externalizing problem behavior in the classroom were stable over time, just as poor family functioning. Continuity of (1) poor communication, (2) discordant partner relationship, and (3) lack of social support were strongly associated with future total problem behavior in the classroom. Furthermore, parental responsiveness to a child's needs was associated with lower future total problem behavior. Opposed to what was expected, a direct association was found between externalizing behavior in the classroom and future poor family functioning. Implications of these findings for future research and practice are discussed.

Introduction

Children with emotional and behavioral disorders (EBD) often experience difficulties that limit adequate functioning in a regular school setting, such as problems with social adaptation, concentration, and motivation (Reid, Gonzalez, Nordness, Trout, & Epstein, 2004, Wagner, Kutash, Duchnowski, Epstein, & Sumi, 2005). As a result, they generally require special educational services or placement in a special educational setting tailored to their needs. The special educational support aims to improve classroom problem behavior and academic achievement through the use of pedagogical strategies and adapted learning instructions. However, due to the complexity and severity of the behavioral problems displayed by children with EBD, providing optimal support remains a challenge for educators and program makers. To be able to better attune the support to the educational needs of this population, a thorough understanding of factors that induce and maintain problem behavior is required. A possible approach to improving this understanding is to examine etiological factors related to the development of problem behavior.

Nowadays it is widely acknowledged that children's problem behavior is the result of the interplay between child and contextual factors. According to Bronfenbrenner's ecological model, development is not an isolated process, but occurs within and is affected by the environments in which children spend their time such as the nuclear family, the family network, and school (Bronfenbrenner, 1986; 2005). For younger children the principal environment in which development takes place is the family context. Unfavorable family factors can influence children's development in a negative manner and become risk factors for the manifestation and persistence of problem behavior. For example, adverse family circumstances have been repeatedly shown to affect the development of externalizing behavioral problems in children such as aggression and oppositional defiant behavior, as well as internalizing behavioral problems such as anxiety and depression (Fergusson, Lynskey, & Horwood, 1996; Loeber & Hay, 1997; Nelson, Stage, Dupoping-Hurley, Synhorst, & Epstein, 2007; Rae-Grant, Thomas, Offord, & Boyle, 1989). Also, evidence has been found for the contributing role of poor family functioning to the reinforcement of psychopathology (e.g., Prange, Greenbaum, Sliver, & Friedman, 1992). With regard to children with EBD receiving special educational support, research results indicate that they are significantly more likely to live in families in which there are several risk factors associated with the development of problem behavior such as unemployment, a low educational level, or divorced parents, than children with other disabilities or typically developing children (Wagner et al., 2005). The families of children with EBD are further characterized by high rates of parental mental health needs and parental stress, and by receiving little social support (Baker-Ericzén, Hurlburt, Brookman-Frazee, Jenkins, & Hough, 2010).

Another principle of the ecological model is that developmental processes occurring in various environments are mutually dependent, which suggests that problem behavior in one environment can transfer to another, for example from home to school and vice versa (Bronfenbrenner, 1986; Brown-Wright, Tyler, Graves, Thomas, Stevens-Watkins, & Mulder, 2011; DiLalla & Mullineaux, 2008; Sameroff, 2000). A way in which a child's behavior in an educational setting can be affected by poor family functioning is through coercive interactions. Negative interaction between children and caregivers can reinforce maladaptive behavioral responses. Such coercive interactions can then be generalized to a classroom setting with teachers and peers, in which the maladaptive behaviors may escalate to more severe disruptive behavioral problems, especially when there are classmates with behavioral problems (Kellam, Ling, Merisca, Brown, & Ialongo, 1998; Patterson, 2002).

When interpreting the findings presented above within the theoretical framework of the ecological model, we may hypothesize that the unfavorable family factors reported for families of children with EBD in special education will affect the extent to which problem behavior is displayed in the classroom. Identification of the relation between poor family functioning and classroom problem behavior within this population, in particular the contributing role of poor family functioning regarding the continuity of classroom problem behavior, is highly relevant for professionals who support and teach these children in special educational settings. If such a mechanism indeed is present, it would counteract the support provided to children with EBD by the special educators during the daytime at school, and diminish the effectiveness of the special educational interventions. Therefore, such knowledge may provide better understanding of the origins and complexity of classroom problem behavior and family factors that contribute to its continuity, and can be used to improve support programs aimed at reducing classroom problem behavior. Outcomes for children with EBD receiving special education are generally quite worrisome due to the excesses of problem behavior and difficulties with social adaptation (Landrum, Tankersly, & Kauffman, 2003), which stresses the need for optimal support.

However, for this specific population studies examining family factors related to continuity of classroom problem behavior are virtually unavailable. Several studies have been conducted that focused on continuity of problem behavior and factors that contribute to continuity with other populations and/or in other contexts (e.g. Burke, Pardini, & Loeber, 2008; Campbell, 1994; Fergusson et al., 1996; Haapasalo & Tremblay, 1994; Herring et al., 2006; Huh, Tristan, Wade, & Stice, 2006; Lyons-Ruth, Alpern, & Repacholi, 1993). Findings from these studies indicate that negative family factors are important predictors of problem behavior at follow-up. However, when it comes to determining the influence of family functioning on continuity of classroom problem behavior of children with EBD in special education, these earlier studies have a number of limitations. For example, research usually focuses on problem behavior in a family context

rather than a classroom context. Studies on the relation between family functioning and classroom problem behavior mainly concentrate on behavior in preschools or in regular classrooms, instead of in special educational settings. Regular and special educational contexts are not merely comparable, because special educational settings involve specialized learning environments and support programs aimed at behavior amelioration. Furthermore, due to recruitment in regular school settings, the samples used in earlier research mainly consisted of high-risk children from the general population with elevated levels of problem behavior. Findings from previous research are therefore not generalizable to clinical samples of children with EBD who are typically vulnerable to developing persistent problem behavior. Therefore, considering the pedagogical climate of special educational contexts and the characteristics of children with EBD and their families, the influence of family functioning on problem behavior displayed by children with EBD in the classroom might be different from the results found in earlier studies into this topic examining other educational contexts and other populations.

We found only one study focusing on the direct relation between family factors and classroom problem behavior displayed by children with EBD in special education. Miller et al. (2006) examined this relation for children diagnosed with ADHD and found a positive association between both constructs. However, they only analyzed aggressive behavior and the measured family factors were static family factors, namely number of parents and siblings in the home, and history of parental aggression. Such static variables are important for the early identification of children at risk for negative developmental outcomes, but generally cannot serve intervention purposes. Also, due to the cross-sectional design direction of effects could not be addressed in this study.

Therefore, the aim of our study was to extend knowledge about the relation between poor family functioning and continuity of classroom problem behavior to include children with EBD in a special educational setting. In order to provide a basis for intervention models, we determined directional associations between poor family functioning and continuity of classroom problem behavior by using a longitudinal design with cross-lagged path analyses as a modeling technique. Analyses were conducted for total problem behavior, and for externalizing and internalizing problem behavior separately.

To enhance the practical relevance of the study findings, only dynamic variables that can be influenced by interventions have been included in the study. On the basis of research identifying aspects of poor family functioning that have been found to be highly predictive of children's problem behavior, the following five aspects were selected: disturbed parent-child communication (Bronfenbrenner, 2005; Burke, Loeber, Lahey, & Rathouz, 2005), poor parental responsiveness (Lindahl, 1998; Stormshak, Bierman, McMahon, & Lengua, 2000), inadequate family organization (Griffin, Botvin, Scheier, Diaz, & Miller, 2000; Haapasalo & Tremblay, 1994), a lack of social support (Vance, Bowen,

Fernandez, & Thompson, 2002), and a discordant relationship between parents (Gilman, Buka, Kawachi, & Fitzmaurice, 2003; Spence, O'Callaghan, Williams, Najman, & Bor, 2002).

We formulated the following two research questions: (1) Does family functioning affect classroom problem behavior among children with EBD in special education? (2) If this is found: which individual aspects of poor family functioning show the strongest associations with classroom problem behavior?

Method

Procedure

Data were collected in an urban part of the Netherlands, at special schools and at regular schools that provide support for children with EBD with special educational needs. Parents of 4- to 12-year old children who receive this support were requested to participate in the study by filling in questionnaires which they could return to Leiden University. Special schools connected to residential facilities were excluded from the sample. Parental consent was obtained for teachers to provide information about their children. The teachers were asked to fill out some questionnaires. Eventually, at Time 1 (T1) questionnaires had been filled out by parents and teachers for 209 children.

For the follow-up survey (T2: Time 2), 168 parents once again received a request to participate in the study and to permit teachers to fill out questionnaires about their children. Children who no longer attended schools, for reasons such as having moved or having graduated, and children who no longer lived at home because of placement in a residential facility or foster family were excluded. Eventually, 84 sets of questionnaires were completed by both parents and teachers. The surveys took place approximately half-way through the school year (mean interval between surveys 11 months), which resulted in two different teachers rating each child's behavioral functioning, so that teacher bias was reduced.

Participants

Our sample consists of 84 children (85 % boys) with EBD, for whom both parents and teachers provided information at T1 and T2. To be eligible for special education in the Netherlands, children have to meet specific criteria designed by the Dutch government. If they do, they are entitled to special educational support within the cluster that serves their specific disability. Subsequently, parents decide in consultation with teachers whether this support will be provided in a special school or in a regular school. Of the children in the sample, 29 % received special educational services in a regular school, and 71 % in a special school. All children met the criteria of the cluster serving children with EBD, which are as follows: (a) a developmental, behavioral, and/or emotional disorder according to the Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition, Text Revision

(DSM-IV; American Psychiatric Association (APA), 2000) accompanied by (b) serious impairments preventing attendance of regular education, deficiencies which (c) the continuum of regular educational care cannot handle without additional help (Ministerie van OCW [Ministry of Education], 2006). Examples of serious impairments are relational problems with classmates and/or teachers, being a danger to others and/or oneself, and severe motivational and attention problems. In addition, problems characteristic of the diagnosed disorders should not be limited to the school environment alone, but must also be present at home and/or during leisure activities. Disorders were formally diagnosed by a qualified clinician. Detailed information about clinical diagnoses, psychometric tests, and main characteristics were obtained by examining the children's assessment reports. These assessment reports had been drawn up by school psychologists and used by a selection board to determine eligibility for special educational support. Of the children in the sample, 15 % were diagnosed with attention deficit hyperactivity disorder (ADHD), 56 % with autism spectrum disorder (ASD), 6 % with oppositional defiant disorder (ODD) or conduct disorder (CD), 3 % with anxiety disorder, and 20 % with comorbid disorders.

Table 1 lists the main characteristics of the children in the sample. Socio-economic status (SES) is represented by the continuous variable Years of Education, which was assessed by calculating the highest number of years of education of the caregivers in the household – primary school included. The Wechsler Intelligence Scale-Revised (WISC-R; Van Haasen et al., 1986) was used to measure intelligence. Assessments were completed by a qualified clinician, as part of the admission procedure for special education.

Table 1
Main Characteristics of the Children in the Sample (N = 84)

	M	*SD*	Min	Max
Age	9.8	1.78	5.9	13.6
IQ	94.2	15.59	58	137
Years of Education Caregivers (SES)	12.5	3.19	8	17

Special educational support only covers care related to educational disabilities, and does not include additional treatment such as family support. For children with EBD this care is generally aimed at improving classroom behavior and provided by specialized teachers, teacher aides (paraprofessionals), learning support teachers, and regular school teachers trained and coached by professionals from special educational services. Support strategies include structuring of the learning environment, positive behavior reinforcement, contingency management, offering emotional support, and reinforcing social and communicative behavior. The way in which support strategies are used and the

particular focus of each individual program are set up and coordinated by school psychologists or behavioral scientists, and registered in IEPs (Individualized Education Programs).

Measures

The Dutch version of the Teachers' Report Form (TRF) (Verhulst, Van der Ende, & Koot, 1997) was used to obtain general problem behavior in the classroom as perceived by the child's teacher. The TRF provides a total scale score (Total Problems), two broad-band scale scores (Internalizing Problems and Externalizing Problems), and eight narrow-band subscale scores (Withdrawn, Somatic complaints, Anxious, Social problems, Thought problems, Attention problems, Delinquent behavior, and Aggressive behavior). The scale Internalizing problems comprises the first three of these subscales, and the scale Externalizing problems contains the last two subscales. Teachers rate problem behavior by answering 118 questions via a response set (0 = not true, 1 = sometimes true, 2 = very true or often true). For the Dutch version of the TRF satisfactory psychometric characteristics were reported (Cronbach's alpha > 0.87, test-retest reliability > .81) (Verhulst et al., 1997). The raw scores of the total scale and the broad-band scales measuring internalizing en externalizing behavior were used in the present study.

To gain insight into family functioning the Dutch Family Questionnaire was used (Scholte & Van der Ploeg, 2013), an instrument measuring children's quality of family life. The questionnaire contains five subscales, namely *Organization* (the strictness of rules that regulate the family interaction), *Communication* (the extent to which caregivers communicate in an open and harmonious way with their children), *Partner Relationship* (the quality of the relationship between caregivers), *Responsiveness* (the extent to which caregivers have an eye for the developmental needs of their children), and *Social Support* (the perceived amount of support from persons outside the family). Each subscale comprises nine items. These five subscales together constitute an overall scale measuring Total Family Functioning. Caregivers can mark each item on a five-point scale (1 = *strongly disagree,* 2 = *disagree*, 3 = *neutral*, 4 = *agree*, and 5 = *strongly agree*). The internal consistency of the subscales was measured with Cronbach's alpha and was found to be between 0.83 and 0.97. The raw scores on the subscales and the overall scale were used in the analyses.

Data Analysis

Descriptive statistics, independent sample *t*-tests, and Pearson correlations (*r*) were calculated using IBM SPSS Statistics 19. It was first examined with independent sample *t*-tests whether children in the study sample (*N* = 84) differed from children in the attrition group (*N* = 84) with respect to total family functioning, externalizing problem behavior, internalizing problem behavior, and total problem behavior (all measured at Time 1).

Additionally, for the study sample, Pearson correlations were calculated to examine relations between the main characteristics (age, gender, IQ, and SES), and family functioning and classroom problem behavior in order to determine which of these variables should be included as covariates in the subsequent path analysis. A correlation coefficient of .10 represents a small effect, .30 a moderate effect, and .50 a large effect (Cohen, 1992). Results showed no significant relations (p > .05) between the main characteristics and the variables measuring classroom problem behavior and family functioning at T1 and T2. No covariates were therefore included in the analyses.

Results from previous research indicate a reciprocal relationship between poor family functioning and problem behavior (Burke, 2008; Patrick, 2005). We therefore examined associations between variables directionally, using cross-lagged path analysis as a modeling technique. Analyses were conducted in EQS 6.1 (Bentler, 1995). With a cross-lagged panel model approach, reciprocal relations between classroom problem behavior and family functioning at two points in time can be examined simultaneously. An advantage of this approach is that it offers the opportunity to study these relations even when it is not possible to manipulate variables in a randomized experiment (Hoyle, 2011). Separate models were generated for total problem behavior, externalizing problem behavior, and internalizing problem behavior.

Our analyses followed a three step approach (see Bennett, 2005; De Jonge et al., 2001). In the first step the relation between classroom problem behavior at T1 and T2, and the relation between family functioning at T1 and T2 was examined in a stability model. In this model possible relations between classroom problem behavior and family functioning are left aside. These relations were examined in the second step, by means of the cross-lagged model (see Figures 1a, 2a, and 3). Where necessary, post-hoc modifications were performed, resulting in a final model with the most parsimonious fit. In the third step we examined the impact of family functioning on classroom problem behavior and/or vice versa by comparing the stability model and the cross-lagged model for best fit. For the comparisons between models we used the chi-square difference test.

Whenever a relationship was found between family functioning at T1 and classroom problem behavior at T2, an additional cross-lagged model was generated using the five separate subscales of family functioning at T1 instead of the over-all scale (see Figure 1b). In this way the importance of family functioning in the prediction of problem behavior at T2 could be determined more precisely.

All analyses were performed using maximum likelihood estimation. The degree of model fit was assessed with the chi-square goodness of fit statistic. This statistic, however, is strongly dependent on sample size and therefore not always a reliable indication of model fit. In the case of smaller samples the chances of a significant chi-square – representing poor model fit – are higher (Bentler, 1995). Therefore, the comparative fit index (CFI) and the root-mean-square error of approximation (RMSEA) were also

determined in order to evaluate model fit. Browne and Cudeck (1993) characterized a model with an RMSEA of .05 or less as a good fit and .10 or more as a poor fit. The CFI should be over 0.90 and ideally over 0.95 (Bentler, 1990).

In Figures 1, 2, and 3 the variables measured are represented by rectangles. One-way arrows represent a unidirectional effect, and two-way arrows represent covariation between variables. All path coefficients are standardized β coefficients. Non-significant paths are not displayed.

Results

Preliminary Analysis

No significant differences were found between children in the study sample and children in the attrition group on any of the examined variables. The results are presented in Table 2.

Table 2

Results of Independent Samples t-tests between Children in the Study Sample and Children in the Attrition Group

	Study sample (n = 84)	Attrition group (n = 84)		
	M (SD)	*M (SD)*	*t*	*p*
Total Family Functioning T1	69.32 (33.45)	78.53 (23.89)	1.423	.157
Internalizing Behavior T1	12.67 (7.77)	12.65 (8.88)	-.013	.989
Externalizing Behavior T1	13.19 (13.21)	17.41 (12.89)	1.785	.076
Total Problem Behavior T1	48.01 (23.47)	54.92 (25.53)	1.579	.117

Correlations between (the subscales of) family functioning and classroom problem behavior are summarized in Tables 3 and 4. Parent ratings on the different family functioning subscales were modestly to highly correlated, just as teacher ratings on the subscales for problem behavior. Family functioning at T2 was modestly correlated with total problem behavior, externalizing behavior, and internalizing behavior at T2, and also with total problem behavior at T1. On a subscale level, responsiveness, communication, and organization were significantly correlated with total problem behavior at T1 with a moderate effect.

Table 3

Means, Standard Deviations and Pearson Correlation Coefficients of the Variables (N = 84)

				T1				T2			
		M	*SD*	1	2	3	4	5	6	7	8
T1	Tot (1)	48.01	23.47	-							
	Int (2)	12.67	7.78	.56**	-						
	Ext (3)	13.19	13.21	.74**	.02	-					
	FF (4)	69.32	33.45	.21**	.08	.17	-				
T2	Tot (5)	45.11	24.73	.55**	.11	.52**	.12	-			
	Int (6)	12.81	7.41	.33**	.36**	.13	.14	.69**	-		
	Ext (7)	12.48	12.39	.57**	-.02	.76**	.13	.84**	.32**	-	
	FF (8)	81.22	21.84	.21	.09	.19	.46**	.29**	.33**	.25*	-

* $p < .05$, ** $p < .01$

Note: Tot = Total problem behavior, Int = Internalizing behavior, Ext = Externalizing behavior, FF = Family functioning

Table 4

Means, Standard Deviations and Pearson Correlation Coefficients of the Subscales Measuring Family Functioning (N = 84)

				T1						T2
		M	*SD*	1	2	3	4	5	Tot	Tot
T1	Res (1)	11.98	4.21	-					.32*	.06
	Com (2)	20.60	7.31	.59**	-				.23*	.20
	Org (3)	13.76	5.05	.75**	.43**	-			.22*	.04
	Soc (4)	17.65	8.82	.39**	.47**	.36**	-		.02	.05
	Par (5)	15.39	6.36	.40**	.39**	.52**	.29**	-	.01	-.04

* $p < .05$, ** $p < .01$

Note: Res = responsiveness, Com = communication, Org = organization, Soc = social support, Par = partner relationship, Tot = Total problem behavior

Model 1 - Family Functioning and Total Problem Behavior

The stability model for family functioning and total problem behavior revealed that family functioning at T1 and T2 are positively associated (β = .46, p < .05), just as total problem behavior at T1 and T2 (β = .57, p < .05). Thus showing that poor family functioning at T1 strongly predicts poor family functioning at T2, and that total problem behavior at T1 strongly predicts total problem behavior at T2. However, the model proved a poor fit to the data (χ^2 (4) = 11.498, p = .022, *CFI* = .845, *RMSEA* = .165). Cross-lagged path analyses (Figure 1a) resulted in a model that represented the data better and well (χ^2 (2) = 2.137, p = .343, *CFI* = .995, *RMSEA* = .032). This final model differed significantly from the stability model ($\Delta\ \chi^2$ (2) = 9.361, p = .009). All significant paths in the final model account for 37 % of the variance of the model predicting problem behavior at T2. The final model adds to the stability model that family functioning at T2 is positively associated with total problem behavior at T2 (β = .30, p < .05), indicating that poor family functioning at T2 predicts total problem behavior at T2. Because family functioning at T1 and T2 are also positively associated, this finding implies that continuity of poor family functioning promotes future total problem behavior. The cross-lagged model further showed that when the continuity in poor family functioning between T1 and T2 is taken into account, poor family functioning at T1 is inversely associated with total problem behavior at T2 (β = -.24, p < .05). This finding suggests that discontinuity in poor family functioning is a protective factor reducing future total problem behavior.

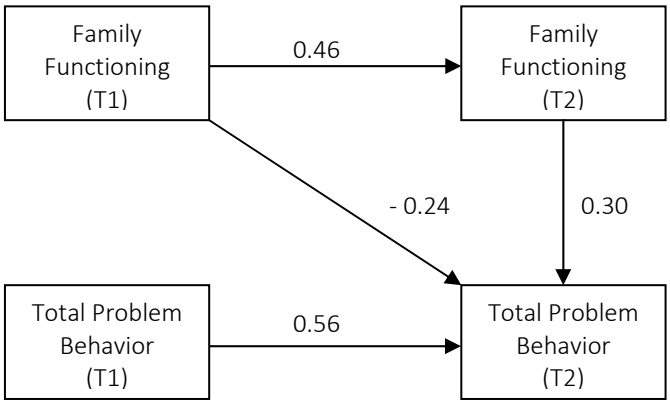


Fig. 1a Final model of Total Problem Behavior at T2 predicted by Family Functioning at both T1 and T2, and Total Problem Behavior at T1. All drawn paths are significant.

To explore the association between family functioning at T1 and problem behavior at T2 in greater detail, a cross-lagged model was analyzed which included the separate subscales of family functioning at T1 instead of the over-all scale (Figure 1b). This model fitted the data

well (χ^2 (6) = 5.260, p = .628, *CFI* = 1.000, *RMSEA* = .000). Poor communication (β = .34, p < .05), poor partner relationship (β = .43, p < .05), and lack of social support (β = .31, p < .05) at T1 are positively associated with poor family functioning at T2. This indicates that these three aspects of poor family functioning are risk factors promoting future poor family functioning. As family functioning at T2 is positively associated with total problem behavior at T2 (β = .28, p < .05), these risk factors also promote future problem behavior. Furthermore, responsiveness is inversely associated with total problem behavior at T2 (β = -.29, p < .05). This suggests that increased responsiveness over time is a protective factor reducing future problem behavior. No significant path was found for organization. The final model accounted for 38 % of the variance.

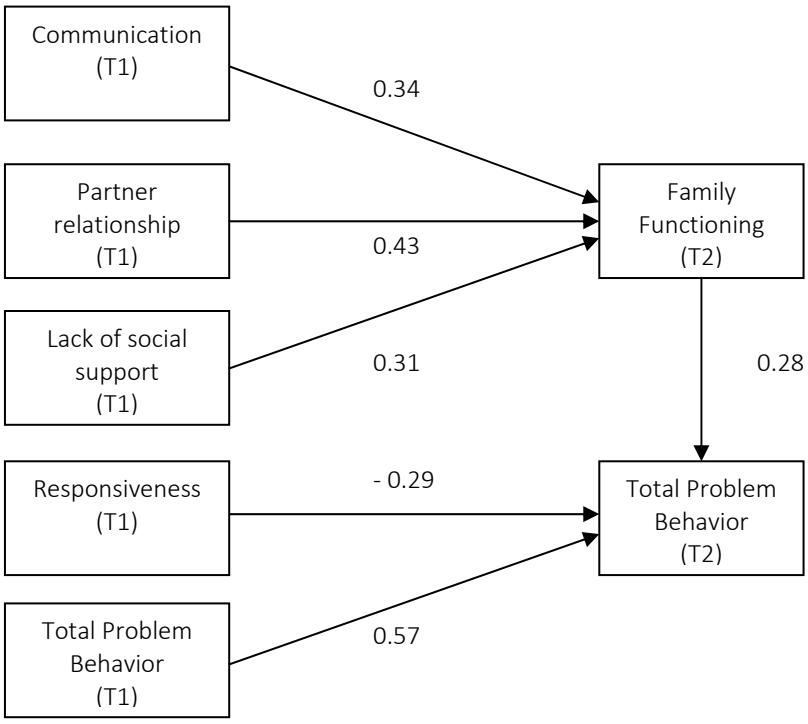


Fig. 1b Final model of total problem behavior at T2 predicted by family functioning at T2, and responsiveness and total problem behavior at T1. All drawn paths are significant.

Model 2 - Family Functioning and Internalizing Problem Behavior

Apart from the association between family functioning at T1 and T2 that was reported in Model 1 (β = .46, p < .05), the stability model with internalizing problem behavior also showed a positive association between T1 and T2 (β = .42, p < .05). The model proved a poor fit to the data (χ^2 (4) = 6.525, p = .163, *CFI* = .920, *RMSEA* = .093).

Cross-lagged path analyses (Figure 2) resulted in a model that represented the data well (χ^2 (2) = .514, p = .773, *CFI* = 1.000, *RMSEA* = .000). All significant paths in the model account for 23 % of the variance of the model predicting internalizing problem behavior at T2. This final model differed significantly from the stability model (Δ χ^2 (2) = 6.011, p = .049). No significant cross-lagged paths were found. However, poor family functioning at T2 is positively associated with internalizing problem behavior at T2 (β = .23, p < .05). Taking into account the association between poor family functioning at T1 and T2, the model suggests that continuity of poor family functioning contributes to future internalizing problem behavior. Because no significant path was found between family functioning at T1 and internalizing problem behavior at T2, an analysis of a cross-lagged model which included the separate subscales of family functioning at T1 was not performed.

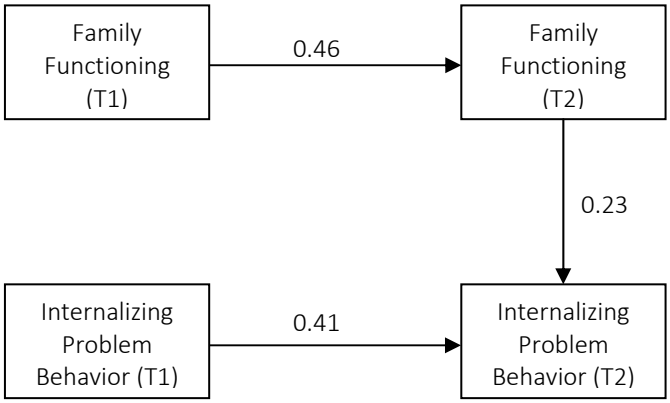


Fig. 2 Final model of internalizing problem behavior at T2 predicted by family functioning at T2 and internalizing problem behavior at T1. All drawn paths are significant.

Model 3 - Family Functioning and Externalizing Problem Behavior

Apart from the found association between family functioning at T1 and T2 that was reported in Model 1 (β = .46, p < .05), the stability model with externalizing problem behavior also showed a strong positive association between T1 and T2 (β = .76, p < .05). The model proved a poor fit to the data (χ^2 (4) = 8.976, p = .067, *CFI* = .936, *RMSEA* = .134). Cross-lagged path analyses (Figure 3) resulted in a model with acceptable fit (χ^2 (3) = 4.446, p = .217, *CFI* = .981, *RMSEA* = .084). The final model differed significantly from the stability model (Δ χ^2 (1) = 4.530, p = .033).

In contrast with the previous models, no significant paths were found between family functioning at T1 or T2 and externalizing problem behavior at T1 or T2. However, when the continuity of externalizing behavior between T1 and T2 is taken into account, it

was found that externalizing problem behavior at T1 is positively associated with poor family functioning at T2 (β = .22, p < .05). This suggests that externalizing problem behavior in the classroom contributes to future poor family functioning. Together with the significant paths found in the stability model, this path accounted for 57 % of the variance of the model predicting family functioning at T2. Because no significant paths were found between family functioning and externalizing problem behavior, an analysis of a cross-lagged model which included the separate subscales of family functioning at T1 was not performed.

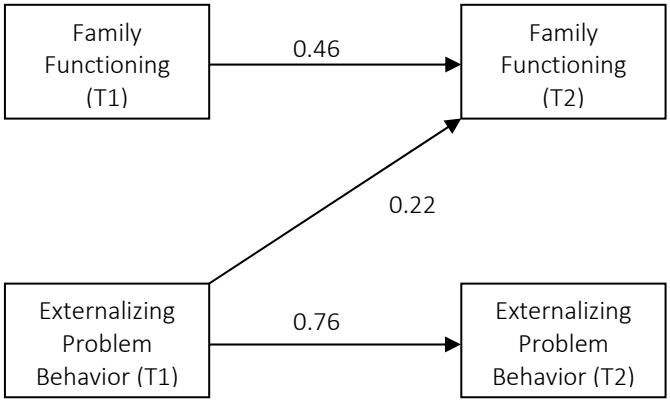


Fig. 3 Final model of family functioning at T2 predicted by externalizing problem behavior at T1. All drawn paths are significant.

Discussion

The objective of our study was to examine the impact of poor family functioning on classroom problem behavior in children with EBD receiving special educational support. Because of the longitudinal design we were able to address direction of effects. This study will certainly add to the existing body of knowledge, for the relation between family functioning and future classroom problem behavior has never been examined for this specific population so far. A better understanding of this relation is of particular importance for professionals in special education supporting and teaching children with EBD, because such knowledge can be used to improve support programs aimed at reducing classroom problem behavior.

Our results have shown that classroom problem behavior at Time 1 can predict classroom problem behavior at Time 2. This relation was found for total problem behavior as well as for internalizing and externalizing problem behavior, with the strongest relation for externalizing problem behavior. These relations indicate that problem behaviors,

particularly externalizing behavior, to a certain degree are stable over time. Similar results were found in earlier longitudinal studies examining developmental courses of psychopathology, including externalizing and internalizing behavior (Englund & Siebenbruner, 2012; Hofstra, Van der Ende, & Verhulst, 2000; Mäntymaa et al., 2011). Although we did not measure the effectiveness of the special educational support provided for the children in our sample, our findings suggest that problem behavior is also relatively stable in a context aimed at improvement of such behavior. Furthermore, we found that family functioning between Time 1 and Time 2 was stable. This is consistent with findings reported in a follow-up study by Huh et al. (2006), in which measures of parental control and parental support were included to represent family functioning.

Subsequently, directional associations between poor family functioning and classroom problem behavior were examined for total problem behavior, internalizing behavior and externalizing behavior separately. For total problem behavior we found that continuity of (1) poor communication, (2) a discordant partner relationship, and (3) lack of social support were the aspects of poor family functioning that were most strongly associated with future manifestations of problem behavior. Furthermore, our model suggested that increased responsiveness to a child's needs can serve as a protective factor that may reduce future problem behavior. This finding is consistent with earlier literature reporting the positive effect of parental warmth and responsiveness in impeding the development of problem behavior (Bradley & Corwin, 2007; Wade et al., 2011). For internalizing behavior we also found that continuity of poor family functioning was associated with future problem behavior of this type. However, no significant cross-lagged paths emerged from the model.

The results for externalizing problem behavior were different than those for total problem behavior and internalizing problem behavior in the sense that we found a direct association between externalizing behavior and future poor family functioning instead of vice versa. A possible reason for this contrasting result could be the pervasive nature of externalizing behavior. As noted above, externalizing problem behavior is more stable than internalizing problem behavior, which indicates that it is more difficult to influence this type of problem behavior through environmental factors or interference. Support for our results can be found in earlier research, even though classroom problem behavior and family functioning were not examined specifically; the studies in question were aimed at exploring reciprocal relations between externalizing or disruptive problem behaviors and parenting behaviors such as communication, involvement, and discipline (Burke, Pardini, & Loeber, 2008; Huh et al., 2006; Stice & Barrera, 1995). Results from these earlier studies showed that changes in externalizing problem behavior have a greater influence on parenting behaviors than changes in parenting behaviors have on externalizing behavior, thereby illustrating the disruptive and pervasive character of externalizing behavior.

In conclusion, our results indicate stability over time of total, internalizing, and externalizing classroom problem behaviors as well as continuity of poor family functioning. Also, the findings confirm the notion of mutually dependent environments as described in Bronfenbrenner's ecological model (1986; 2005), as they indicate that poor family functioning can enhance future total problem behavior and internalizing problem behavior in the classroom, and that externalizing behavior problems at school can lead to poorer future family functioning.

Limitations and Future Directions

Our results have to be interpreted in the context of the study's limitations. First, the main focus was on the impact of family functioning on classroom problem behavior; therefore, there may have been other factors not included in the model that also influenced this behavior. For instance, other studies have indicated that the presence of learning problems in children with EBD is predictive of poor behavioral functioning in a school setting (Miller et al., 2006; Vance, Bowen, Fernandez, & Thompson, 2002). Also, the quality of the classroom climate has been found to be related to disruptive behavior in the classroom. Variables indicative of a good classroom climate are effective classroom management practices, teacher involvement, teacher support, and student engagement (Thomas, Bierman, Thompson, & Powers, 2008). Thomas et al. (2008) examined the impact of classroom climate on disruptive behavior in first grade. Their findings show that poor classroom quality increases the risk of aggressive-disruptive behavior at school when this behavior was exhibited at home prior to school entry. Results from other studies lead us to suspect that a variable of particular importance in this respect is the teacher-child relationship. Especially for children with externalizing and internalizing problem behaviors, teacher-child relationships characterized by closeness and relatively few conflicts reduce classroom problem behavior, and increase the likelihood of successful school adjustment (Baker, Grant, & Morlock, 2008; Buyse, Verschueren, Doumen, Van Damme, & Maes, 2008). In view of these results we recommend that future studies expand the predictive model used in our study by examining the influence of learning problems and the quality of classroom climate – with specific attention to teacher-child relationships – on problem behavior displayed by children with EBD in a special-education context.

Second, coercion theory (Patterson, 2002) and findings from previous research (Barth, Dunlap, Dane, Lochman, & Wells, 2004; Kellam et al., 1998) suggest that an increase of maladaptive behavior in the classroom is related to the presence of other children with problem behavior, in particular aggressive-disruptive behavior. Because of the relatively higher number of children with EBD in special schools, it is conceivable that the contribution of poor family functioning to the continuity of classroom problem behavior that we found for the children in our sample and vice versa could differ between special schools and regular schools. Unfortunately, we were unable to examine this

hypothesis in our study due to the small sample size which made differentiation between special educational settings not feasible. When studying the impact of family functioning on the continuity of classroom problem behavior, future research should therefore take into account the frequency and presence of other classmates with problem behavior in the classroom in different special educational settings.

Third, an advantage of our study was the longitudinal design which offers the opportunity to examine direction of effects. However, in order to make statements about the influence of family functioning on the developmental course of classroom problem behavior, a longitudinal study over a longer period than the span of one year we had in our study is necessary.

Practical Implications

Our research findings illustrate the importance of a two-component support strategy, involving the school as well as the family, to improve interventions and support provided to children with EBD in special education. In this respect more attention should be given to the development and persistence of externalizing problem behavior in the classroom, because of the finding that externalizing behavior adds to the continuity of poor family functioning. An important aspect that schools and educators should focus on when they provide support and design intervention models is the influence of the classroom context, specifically the possibility of coercive interaction patterns between children displaying disruptive behavior.

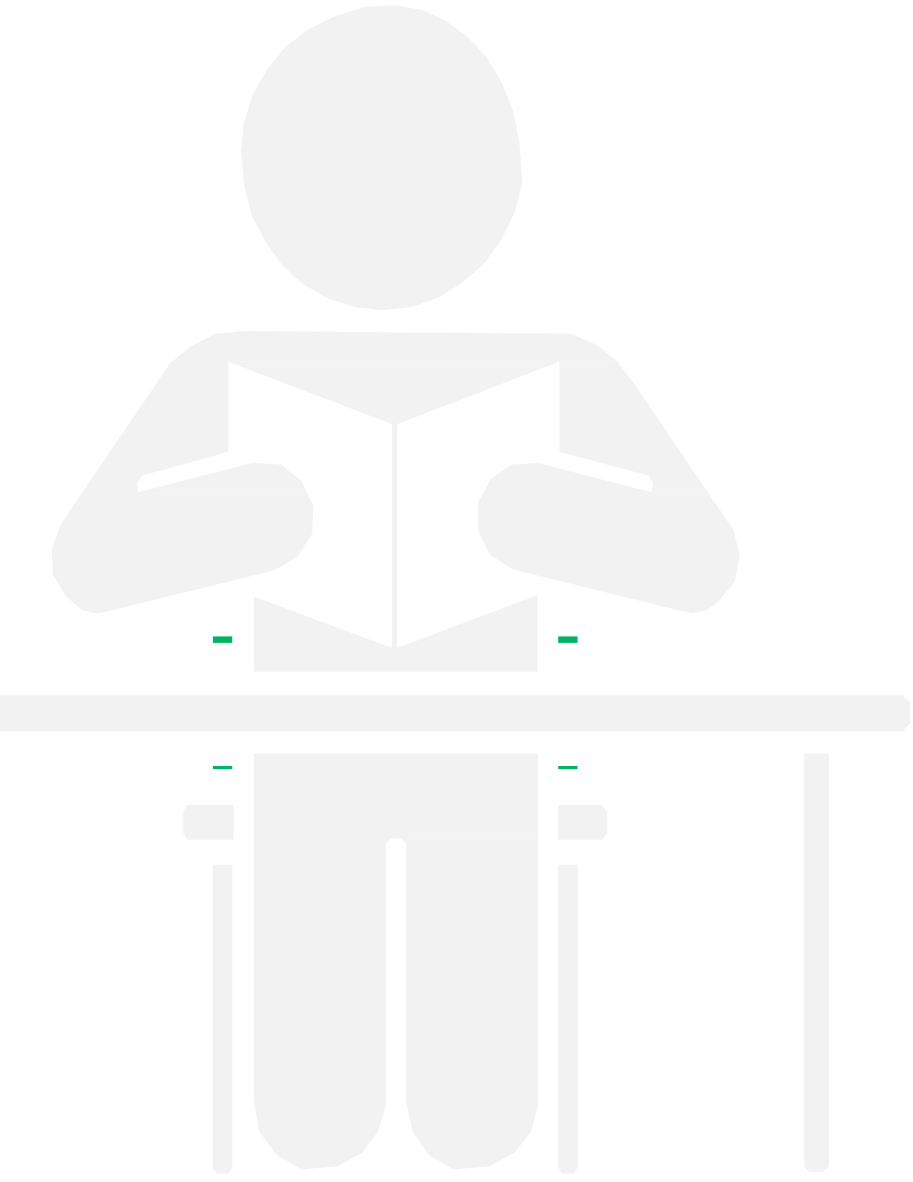
Combining home intervention with special educational support seems beneficial for several reasons. First, a number of researchers have reported improved efficacy of interventions aimed at reducing disruptive emotional and behavioral problems when the family was included (e.g., Baker-Ericzén et al., 2010; Haine-Schlagel, Brookman-Frazee, Fettes, Baker-Ericzén, & Garland, 2012). Second, our results suggest an undermining effect of poor family functioning on the efficacy of special educational support because of its influence on the continuity of total and internalizing problem behavior in the classroom. To improve family functioning and reduce negative effects on classroom problem behavior, home intervention should specifically focus on responsiveness, because we found this aspect of family functioning to be of particular influence on future total problem behavior.

Although families of children with EBD were found to have higher rates of poor family functioning (Baker-Ericzén et al., 2010; Wagner et al., 2005), this does not imply that all families with children with such disorders are in need of home intervention. However, for all children with EBD parental involvement in their education is important. Findings from previous studies show that when parents are involved in their child's education, children show improved behavior in school, socially as well as academically (Bulotsky-Shearer, Wen, Faria, Hahs-Vaughn, & Korfmacher, 2012; Fantuzzo, McWayne, Perry, & Childs, 2004). To reduce classroom problem behavior, schools should therefore invest in

the quality of the parent-teacher relationship and stimulate a higher involvement of parents in the educational process, especially considering the finding that families of children with EBD are significantly less involved in their children's education than families of children with other disabilities (Wagner et al., 2005).

General Conclusions and Discussion

6



Children with special educational needs require additional support in order to profit optimally from their education. This special educational support can be offered in regular schools or in more restrictive settings such as a special school. Children with emotional and behavioral disorders (EBD) as their primary disability are a substantial part of the population receiving special education. However, several important topics for this group remain underexplored. First, there is a need for a better understanding what characterizes the special educational needs of children with EBD who visit special schools or receive inclusive education at regular schools, and to learn which of these characteristics affect inclusion of these children in regular education. Second, there is little knowledge about behavioral and academic progress of children with EBD in various special educational settings, and of a possible differential influence of setting on progress outcomes. Also, more clarity is needed regarding the extent to which common pedagogical strategies are used in the classroom to ameliorate problem behavior and the relation with progress. Third, research has documented that the family context plays an important role in the development of problem behavior and the extent to which this behavior is displayed in other contexts then the home environment such as the school. However, the relation between family factors and classroom problem behavior of children with EBD in special education has never been examined so far. Therefore, the main objective of this dissertation was to gain more insight into the before mentioned topics. Extension of our knowledge is necessary for a better understanding of learning environments that best fit the educational needs of these children, and can serve as important input for the improvement of intervention strategies and special educational services provided by teachers and other professionals to children with EBD in special education. In this chapter, the general conclusions will be presented and discussed in relation to limitations and implications for future research and practice.

Characteristics that Predict Restrictiveness of Special Educational Setting

Previous research into special educational placement of children with disabilities shows that children with EBD are placed more often in settings of a more restrictive type, such as segregated classrooms or separate schools and facilities, than children with other disabilities like physical handicaps or learning disabilities (LD) (De Greef & Van Rijswijk, 2006; Epstein, Nelson, Polsgrove, Coutinho, & Quinn, 1993; Stephens & Lakin, 1995). Considering the international opinion to move towards inclusive education for children with disabilities and the considerable efforts governments make to offer these children a place in a regular school environment, the question arises why the inclusion of children with EBD is relatively limited.

In order to provide more insight into this matter, we first examined differences in characteristics of children with EBD who are educated in settings varying in restrictiveness, i.e. schools for special education and regular schools with special educational support

(inclusive education). Overall the findings indicate that children with EBD in special schools are more severely disabled, function on a lower cognitive level, experience more risk factors, and come from more poorly functioning families than children with EBD in regular schools. *The presence of relational problems between child and caregiver*, *poor academic performance*, and *a young age when youth care was called in for the first time* were found to be the strongest discriminating factors of placement in a special school or a regular school. The relevance of these three factors in the prediction of the level of restrictiveness of special educational placement was also stressed by Hosp and Reschly (2002), who found a similar set of discriminating factors for children with learning disabilities (LD). The findings of this previous study and our study suggest that placement in a restrictive setting is determined to a greater extend by factors other than those arising directly from the impact of the developmental disorders, such as the severity of internalizing and/or externalizing behavior.

Differential Influence of Special Educational Setting on Progress

As mentioned previously, under the influence of the movement towards inclusive education for children with disabilities, these children can receive special education in settings varying in restrictiveness. As a consequence, the number of children with disabilities in regular schools is increasing (Chakrabarti & Fombonne, 2001; Inspectie van het Onderwijs, 2013). It has therefore become increasingly important to evaluate developmental progress of children with disabilities who receive special support and the extent to which progress might be differentially influenced by educational setting. However, regarding children with EBD, studies examining developmental progress in special education are rare, in particular across settings. To extend our knowledge about this topic, we explored and documented differences in progress between children with EBD in special schools and in inclusive education. We focused on children with ADHD and children with high-functioning ASD (HFASD) specifically, because they make up a substantial part of the population with EBD who receive special educational support, and because they generally can be considered for placement in restrictive environments as well as for inclusive education. We examined progress in children's functioning by including measures of disorder-specific symptoms and non-disorder-specific problem behavior, and by assessment of performance in reading, spelling, and mathematics. At the time of pre-assessment, children in both settings were comparable on these measures and on relevant background characteristics.

Progress in behavioral functioning

Our findings indicated that children with ADHD in both educational settings made progress in behavioral functioning showing a decrease of impact of ADHD-disorder specific symptoms. Regarding non-disorder-specific problem behavior, we found a trend towards a

decrease of physical complaints, thought problems, and social problems. Comparable results were found for children with HFASD: in both settings improvements were made within one year, showing a decrease in severity of autistic behavior, social problems, and attention problems. The results are partly comparable to those found in previous studies. For example, Arick et al. (2003) and Osborne and Reed (2011) also found progress regarding emotional and behavioral difficulties, and behaviors associated with ASD. On the other hand, Charman et al. (2004) reported no decreases in symptom severity, communication, and socialization for children with ASD.

Progress in academic achievement

Regarding academic achievement progress was found for children with ADHD and children with HFASD on mathematics, reading, and spelling. However, the growth rate did not respond to the academic achievement standards typically set for children with an IQ in the normal range. This implies that although the children with ADHD and the children with HFASD made progress in all measured core curricular areas, they underachieved in relation to their cognitive abilities. These results correspond to previous research on academic outcomes of children with ADHD showing that underachievement is common in this population when IQ is controlled for (Diamantopoulou, Rydell, Thorell, & Bohlin, 2007), or when children with ADHD are compared with typically developing peers matched by intelligence (Barry et al., 2002). Similar findings are also reported for children with HFASD by Ashburner et al. (2010), who compared children with this disorder in regular classrooms with typically developing peers on several developmental aspects, including academic achievement.

Differential influence of educational setting

Contrarily to what we expected for both children with ADHD and children with HFASD no significant differences were found in the degree of progress made between children in special schools and in inclusive education regarding behavioral and academic functioning. These findings suggest that, with background variables and studied variables initially similar, school environment does not account for differences in progress between settings regarding improvement in the before mentioned areas for these particular groups of children.

We found no studies focusing on progress in behavioral functioning of children with ASD across educational settings, but similar outcomes were found in previous studies comparing progress in the acquisition of language skills (Harris et al., 1990) and academic performance (Waddington & Reed, in press) of children with ASD in inclusive education and special schools. Regarding children with ADHD, no studies comparing behavioral and academic progress in different special educational settings are available as yet. However, some studies on this specific topic have been conducted with children with learning

disabilities and behavioral disorders in general and did report differences in developmental progress between children across settings, although the results were not conclusive. For instance, Peetsma, Vergeer, Roeleveld, and Karstens (2001) revealed no differences in psychosocial development between children with mild learning and behavioral disorders (LBD) in inclusive education and in special schools, but stronger cognitive gains were found for children with LBD in inclusive education. On the other hand, Schneider and Leroux (1994) found that children with behavioral disorders in special classes showed higher academic achievement, but less improvement in self-concept than children with behavioral disorders in inclusive classrooms.

Pedagogical Strategies Related to Progress in Behavioral Functioning

Apart from behavioral and academic functioning, we examined the influence of common pedagogical strategies used for children with ADHD and children with HFASD in the daily classroom practice by studying relations between progress and the extent to which these strategies were emphasized. The selection of included strategies was based on literature about intervention and treatment of children with these disorders. For children with ADHD the results showed that positive behavior reinforcement was most strongly related to a decrease of ADHD-associated problem behavior. This outcome was expected and in line with extensive previous research into the effectiveness of interventions based on this strategy that aim at reducing problem behavior in children with ADHD (e.g., Fabiano et al., 2010; Owens et al., 2005). For children with HFASD structuring of the learning environment and reinforcement of social and communicate behavior were related to a decrease in social problems and autistic behavior, respectively. These relations were also hypothesized, because these strategies are widely used to ameliorate the attentive, social, and communicative problems of children with ASD.

A finding that was not expected was the relative importance of offering emotional support in decreasing problem behavior of both children with ADHD and children with HFASD, because initial analyses showed that this strategy was the least emphasized in the daily classroom practice, and because the use of this strategy appears somewhat less obvious in the treatment of children with primarily externalizing behavior or children who experience difficulties in the areas of social interaction and communication. However, similar findings were also reported in other studies. Hamre and Pianta (2005), for example, found that emotional support offered by teachers played a particularly important role in the positive development of children with a combination of classroom problems such as academic, social, and behavioral problems. Scholte, Van Berckelaer-Onnes, and Van der Ploeg (2007) examined emotional and behavioral development of children with ADHD in after-school day treatment centers, and reported a reduction of ADHD symptoms at follow-up only when the emphasis on behavioral control was combined with expressing emotional support. The findings of our study and the previous studies suggest that

emotional support should be an important element in the treatment of children with ADHD and HFASD in special education.

Relations between Family Functioning and Classroom Problem Behavior

Study findings show that children with EBD who receive special educational support are more likely to live in poorer functioning families than children with other disabilities receiving special educational support or typically developing children (Wagner et al., 2005). Reasoning from the ecological model of Bronfenbrenner and the coercive interaction theory we may hypothesize that poor family functioning is related to the severity of problem behavior displayed by children with EBD in the classroom. When such a relation indeed is present, it could counteract the support provided to these children and diminish the effectiveness of special educational interventions. However, as far as we know, studies examining this relation for children with EBD in special education are virtually unavailable. Therefore, the impact of family functioning on classroom problem behavior could not be determined for this specific population so far.

We examined this relation for internalizing, externalizing, and total problem behavior at school over two points in time. First, our results indicated that problem behaviors, in particular externalizing behavior, are stable over time, even in a context aimed at improvement of such behaviors. Support for our findings can be found in earlier longitudinal studies examining developmental courses of psychopathology, including externalizing and internalizing behavior (Englund & Siebenbruner, 2012; Hofstra, Van der Ende, & Verhulst, 2000; Mäntymaa et al., 2011). Family functioning was also found to be stable over time, which is consistent with findings reported in a follow-up study by Huh et al. (2006). Second, of the five domains of family functioning, (1) poor communication, (2) a discordant partner relationship, and (3) lack of social support were most strongly associated with future total problem behavior displayed in the classroom. Also, parental responsiveness to a child's needs appeared to reduce future total problem behavior. These findings are consistent with earlier studies examining the relation between family functioning and the development of problem behavior in community settings (e.g. Burke, Loeber, Lahey, & Rathouz, 2005; Gilman, Buka, Kawachi, & Fitzmaurice, 2003; Stormshak, Bierman, McMahon, & Lengua, 2000; Vance, Bowen, Fernandez, & Thompson, 2002).

The results for externalizing problem behavior were different than those for total problem behavior and internalizing problem behavior in the sense that we found a direct association between externalizing behavior and future poor family functioning instead of vice versa. A possible reason for this contrasting result could be the pervasive nature of externalizing behavior. Compared to internalizing problem behavior it is more stable over time – as was found in our study – , which indicates that it is more difficult to influence this type of problem behavior through environmental factors or interference. Support for our results can be found in earlier research where findings show that changes in externalizing

problem behavior have a greater influence on parenting behaviors than changes in parenting behaviors have on externalizing behavior (Burke, Pardini, & Loeber, 2008; Huh et al., 2006; Stice & Barrera, 1995).

Our findings confirm the notion of mutually dependent environments as described in Bronfenbrenner's ecological model (1986; 2005) for this specific population. Together with the results described in Chapter 2, i.e. relational problems between children with EBD and their caregivers is the strongest predictor for placement in a more restrictive educational setting – a setting where generally children with more severe behavioral problems are enrolled – , these findings underline the importance of an integral approach towards amelioration of emotional and behavioral problems in children. Within such an approach, support must be provided to children and their families simultaneously and coherently.

Limitations and Future Directions

Given the quasi-experimental design of our study and the limited available data regarding our research topics, the results of this study must be considered exploratory in nature. This has implications for the interpretation of our study findings. For instance, in Chapters 2 and 3 we have tried to document progress outcomes of children in two special educational settings and described differences in progress between these settings. Based on the current data, it is not possible to draw conclusions about the effectiveness of the settings or (the absence of) differences in progress outcomes. Studies in which other variables are controlled for, for instance teacher experience, parental involvement, and classroom climate, are needed to confirm our findings and shed more light on them. Therefore, our results should be considered as providing leads for further research into the studied topics, and to give suggestions for practice and policy making.

Some limitations concerning generalizability should be bared in mind as well when interpreting the results. International educational systems often consist of a continuum of special educational services and settings, resulting in a larger variety of learning environments. However, due to the Dutch educational system we were able to compare children in only two special educational settings, i.e. special schools and regular schools with special educational support (full inclusive education). This restriction might make the results of our study less applicable to international educational systems. Also, a consequence of a larger variation in learning environments might be that there is a wider spread of population characteristics, such as problem severity, between special educational settings. This may result in a different composition of characteristics of Dutch children in special schools and in inclusive education compared to the characteristic of children in similar settings in other countries. Therefore, we recommend future studies to include samples of children with EBD enrolled in a larger variety of settings within a special educational continuum. With the prospect of a changing Dutch educational system as a

result of the Passend Onderwijs policy – which leaves room for other special educational practices – this might also become feasible for research conducted in the Netherlands.

Another concern with respect to generalizability of the findings is the specificity of characteristics of the studied children with ADHD or HFASD (Chapters 2 and 3). In order to make a reliable comparison, the children in special schools and in inclusive education had similar learning/behavioral profiles with problem severity and cognitive functioning on a certain level. This limits the generalizability of the findings to children diagnosed with ADHD or HFASD who have different learning needs and abilities then the children in our study. To further broaden our understanding of progress of children with ADHD or HFASD in special education, samples with other learning/behavioral profiles should be studied.

Considering the exploratory nature of our study, we have chosen to focus initially on general problem behavior, disorder-specific behavior, and academic achievement. However, to obtain a more comprehensive picture of children's functioning in a special educational setting, future research should also include instruments that measure a larger variety of behaviors and skills relevant for functioning in a school environment, such as adaptive behavior, social skills, on-task behavior, and motivation. Also, when focusing on children with specific developmental disorders, it would be informative to include additional instruments that measure symptom-specific aspects in greater detail.

Practical Implications

One of the main findings of our study is that no differences were found in progress outcomes between children in special schools and in inclusive education. This might indicate that equal progress in the investigated areas can be expected in either setting for the specific groups of children included in our study. Based on this finding, a cautious recommendation that can be made is that, in terms of progress outcomes, the option of a regular classroom as a suitable learning environment for children with EBD should be considered more often when decisions about special educational placement in the least restrictive environment are to be made. However, to enhance their chances of being included in regular education and to stimulate positive development, certain aspects that arise from our study findings should receive attention.

One important aspect concerns family functioning, in particular the communication between children and caregivers, the relationship between caregivers, and responsive parenting. Difficulties in these areas were associated with classroom problem behavior and a diminished likelihood of being placed in an inclusive setting. It is therefore of vital importance that support is also provided to the families of children with EBD if problems in the before mentioned areas exist. Within such an integral approach, support must be provided coherently. It is therefore essential that a closer and more fruitful collaboration between schools and family care services, and teachers and parents, will be established,

which can also increase the efficacy of interventions and support provided to children with EBD in the classroom.

A second aspect is the relative importance of emotional support in the reduction of maladaptive classroom behavior of children with EBD. Because of the predominantly externalizing problem behaviors and/or difficulties with communication and social interaction of this population, educators and program makers are possibly less inclined to emphasize this strategy in the daily classroom support of children with EBD. However, according to our research findings, emotionally supportive interactions between children and educators deserve a more prominent place in the treatment of children with EBD, all the more because the quality of the teacher-child relationship was found to be an important predictor of successful school adjustment for children at risk (e.g. Baker, Grant, & Morlock, 2008; Hamre & Pianta, 2005).

The relation between specific (classroom) interventions and academic performance is a third aspect that should receive particular attention. Not only because poor academic performance was found to be an important indicator of placement in a restrictive setting, but also because our studies have shown that children with EBD in both educational settings underachieve in relation to their cognitive abilities and compared to typically developing peers. The interfering nature of problem behavior and its negative effect on task orientation might direct special educational support for a substantial part towards behavior amelioration – in the assumption that learning will improve as an indirect consequence of behavior support. Our findings indicate that learning and academic achievement and its supporting mechanisms should receive heightened emphasis within educational intervention programs. This issue has also been put forward by the Dutch Inspectorate of Education (Inspectie van het Onderwijs), who stated that an increased focus on study results, and a better fit between educational curriculum, methods, and individual learning needs of children in special education is required in order to increase their performance. In this context, monitoring and evaluating academic achievement, individual needs and progress outcomes is of vital importance. However, these methods are not often practiced in special education (Inspectie van het Onderwijs, 2013).

Last, successful inclusion of children with EBD in regular education largely depends on the degree to which teachers are capable of educating and supporting children with such difficulties in their classrooms. Professionalization of teachers by expanding their knowledge of and experience with the support of children with EBD is therefore important. This can be realized for example by teacher training or by letting teachers engage more often in multi-disciplinary consultations with school psychologists and other professionals. Also, handling and supporting children with EBD and their specific individual needs should receive more attention in the curriculum of teacher training so that teachers-to-be learn to be effective and experience more confidence when educating these children.

Final Remark

Our study findings suggest that children with EBD can make similar progress in a regular classroom compared to a special school. This is important knowledge to consider when decisions about special educational services and placement in the least restrictive environment have to be made. However, these findings do not imply that inclusive education is a feasible option for all children with EBD. Taking into account the complexity and severity of the problems of some children with EBD, it is questionable whether regular schools will ever be able to provide suitable education for children who have to cope with the most severe emotional and behavioral disorders. For these children special schools, or wholly or partly separated facilities with more knowledge, time, and means to handle children with these types of behavioral problems will probably always be needed.

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Summary in Dutch

(Nederlandse samenvatting)

Introductie

Kinderen met specifieke onderwijsbehoeften hebben extra begeleiding op school nodig om optimaal van het onderwijs te kunnen profiteren. Wanneer er sprake is van een ernstige onderwijsbeperking kunnen kinderen in aanmerking komen voor ondersteuning vanuit het speciaal onderwijs. Deze speciale ondersteuning kan geboden worden in een reguliere school of in een meer restrictieve omgeving, zoals een school voor speciaal onderwijs. Een substantieel deel van de kinderen dat gebruik maakt van dergelijke ondersteuning heeft te maken met gedrags- en/of emotionele problemen. Dit betreft een heterogene groep kinderen waarbinnen een grote variëteit bestaat aan ontwikkelingsstoornissen en onderwijsbehoeften- en capaciteiten. Ondanks deze verscheidenheid heeft deze groep een aantal onderwijsbelemmeringen gemeenschappelijk. Zo vertoont het merendeel van de kinderen onaangepast en storend gedrag. Daarnaast zijn hun sociale vaardigheden vaak minder goed ontwikkeld dan die van kinderen met andersoortige beperkingen of zich normaal ontwikkelende kinderen. Hierdoor kunnen zij bijvoorbeeld verzeild raken in conflicten met medeleerlingen of leerkrachten. Ook werkhoudings-gerelateerde problemen met betrekking tot motivatie en concentratie komen regelmatig voor, evenals achterblijvende leerprestaties. Door de karakteristieke afwijkende gedragspatronen worden kinderen met gedrags- en/of emotionele problemen beschouwd als een bijzonder uitdagende populatie om te onderwijzen en te ondersteunen.

In de afgelopen decennia heeft er uiteenlopend onderzoek plaatsgevonden naar kinderen met beperkingen in het speciaal onderwijs, maar de groep kinderen met gedrags- en/of emotionele problemen is hierbij relatief onderbelicht gebleven. Zo is er nog onvoldoende zicht op de aard en ernst van onderwijsbehoeften en omgevingsfactoren van deze kinderen die de kans om onderwijs in een reguliere setting te volgen negatief kunnen beïnvloeden. Daarnaast is weinig onderzoek gedaan naar vooruitgang op gedragsniveau en op het gebied van leerprestaties van kinderen met gedrags- en/of emotionele problemen in verschillende settingen voor speciaal onderwijs, en naar een mogelijk afzonderlijke invloed van setting op vooruitgang binnen deze ontwikkelingsdomeinen. Hierbij is bijvoorbeeld ook de mate waarin gebruik wordt gemaakt van pedagogische strategieën in de begeleiding van kinderen met gedrags- en emotionele problemen binnen de schoolsetting en de relatie met vooruitgang van belang. Een ander belangrijk aandachtsgebied betreft de invloed van het gezinsfunctioneren op gedragsproblemen in de klas. Onderzoek heeft uitgewezen dat de familiecontext van invloed is op het ontstaan van probleemgedrag en de mate waarin probleemgedrag voorkomt in andere omgevingen, zoals de school. Er is daarentegen nog geen onderzoek bekend waarbij de relatie tussen gezinsfunctioneren en probleemgedrag in de klas specifiek voor kinderen met gedrags- en/of emotionele problemen in een speciaal onderwijs context is onderzocht. Het pedagogische klimaat dat in dergelijke settingen wordt geboden, de ernst van de

problematiek en de bevinding dat het gezinsfunctioneren van kinderen met gedrags- en/of emotionele problemen in het speciaal onderwijs problematischer is bevonden dan dat van kinderen met andersoortige beperkingen in het speciaal onderwijs, maakt dat de resultaten uit eerder onderzoek niet zondermeer te vertalen zijn naar deze specifieke populatie.

Het hoofddoel van het huidige onderzoek is dan ook om meer licht te werpen op de hierboven genoemde onderzoeksonderwerpen teneinde een beter begrip te krijgen van leeromgevingen die het best aansluiten bij de speciale onderwijsbehoeften van kinderen met gedrags- en/of emotionele problemen, zodat onderwijsinterventies en -ondersteuning voor deze kinderen in de toekomst kunnen verbeteren.

Belangrijkste bevindingen

Kenmerken die de keuze voor speciaal onderwijssetting bepalen

Al decennia lang klinkt in internationaal verband de roep om kinderen met beperkingen zoveel mogelijk te onderwijzen en te ondersteunen in een reguliere schoolsetting samen met leeftijdsgenoten zonder beperkingen. Dit streven naar 'inclusief onderwijs' heeft als voortrekkers landen als de Verenigde Staten, Groot-Brittannië en de Scandinavische landen, maar ook Nederland heeft zich hieraan gecommitteerd. De meest recente ontwikkeling in dit kader is het Passend onderwijsbeleid, waarmee de Nederlandse overheid beoogt meer kinderen met beperkingen een passende plaats in het regulier onderwijs te bieden met meer mogelijkheden tot maatwerk in de begeleiding.

Ondanks de nationale en internationale inspanningen om inclusief onderwijs mogelijk te maken, is uit onderzoek gebleken dat er nog steeds relatief weinig kinderen met gedrags- en/of emotionele problemen worden geplaatst in een reguliere onderwijssetting: in vergelijking met kinderen met andersoortige beperkingen ontvangt deze groep kinderen vaker speciale onderwijsondersteuning in een meer restrictieve setting. Om meer zicht te krijgen op mogelijke factoren die hieraan ten grondslag liggen, is onderzocht welke kenmerken van de populatie kinderen met gedrags- en/of emotionele problemen in het speciaal onderwijs de keuze voor onderwijssetting bepalen (Hoofdstuk 2). Uit die studie kwam naar voren dat de aanwezigheid van relatieproblemen tussen kind en opvoeder, zwakke leerprestaties en de leeftijd waarop voor het eerst sprake was van jeugdzorg de belangrijkste voorspellers zijn voor plaatsing in een school voor speciaal onderwijs in plaats van in het regulier onderwijs. Deze bevinding suggereert dat vooral factoren die niet direct gerelateerd zijn aan de primaire symptomen van ontwikkelingsproblematiek zoals die in deze populatie voorkomt – bijvoorbeeld ADHD, ASS, oppositioneel opstandig gedrag – in grotere mate bepalend zijn voor de setting waarin speciale onderwijsondersteuning wordt geboden.

Vooruitgang in gedragsproblemen en leerprestaties en de invloed van onderwijssetting

Om zicht te krijgen op de ontwikkeling van kinderen, de gebieden waarop kinderen extra begeleiding nodig hebben en om input voor de verbetering van interventies en begeleiding te verkrijgen, is het belangrijk dat vooruitgang op het gebied van leerprestaties en gedrag wordt gemonitord en geëvalueerd. Aangezien kinderen met gedrags- en/of emotionele problemen zowel in het regulier onderwijs als in scholen voor speciaal onderwijs geplaatst kunnen worden, is het van belang vooruitgang van kinderen en verschillen in vooruitgang tussen beide settingen te onderzoeken. Kennis op dit gebied kan het begrip met betrekking tot leeromgevingen die het best aansluiten bij de onderwijsbehoeften van deze groep vergroten.

In de studies beschreven in Hoofdstuk 3 en Hoofdstuk 4 worden deze onderwerpen onderzocht voor respectievelijk kinderen met een aandachtstekort/hyperactiviteitstoornis (ADHD) en kinderen met een autismespectrumstoornis (ASS). De reden dat kinderen met deze stoornissen apart worden belicht in dit onderzoek is dat zij een groot deel uitmaken van de groep kinderen met gedrags- en/of emotionele problemen die speciale onderwijsondersteuning ontvangen. Er is in de studies gebruik gemaakt van een follow-up design met twee meetmomenten met een gemiddeld interval van 11 maanden tussen de metingen. Leerkrachten vulden verschillende vragenlijsten in voor de kinderen in de steekproef, gericht op leerprestaties en gedragsaspecten. Uit de resultaten kwam naar voren dat kinderen met ASS in beide settingen vooruitgang boeken op het gebied van autistisch gedrag (vermindering van de impact van de symptomen), sociaal gedrag (vermindering van sociale problemen) en met betrekking tot aandachtregulatie (verminderen van aandachtsproblemen). Voor kinderen met ADHD wordt binnen beide settingen een afname gevonden van ADHD kenmerken. Ook is er voor kinderen met ASS en ADHD in beide settingen vooruitgang zichtbaar met betrekking tot de leerprestaties. Wel geldt hierbij dat de geboekte vooruitgang in leerprestaties niet genoeg is om bestaande leerachterstanden in te lopen. De kinderen in de onderzoeksgroepen presteren na een jaar nog steeds op een lager niveau dan op basis van de cognitieve capaciteiten verwacht mag worden. Voor zowel kinderen met ASS als kinderen met ADHD wordt daarnaast geen verschil in vooruitgang op gedragsniveau en leerprestaties gevonden tussen kinderen in scholen voor speciaal onderwijs en kinderen in het regulier onderwijs. Deze bevinding impliceert dat, onder voorwaarde van gelijke achtergrondvariabelen en gelijke waarden op de beginmeting, de onderwijssetting waarin deze specifieke groepen kinderen geplaatst zijn niet van invloed is op de vooruitgang die in beide settingen op de onderzochte gebieden wordt waargenomen.

Pedagogische strategieën gerelateerd aan vooruitgang

Naast de vooruitgang op het gebied van gedragsproblemen en leerprestaties is in het huidige onderzoek gekeken naar de mate waarin veelgebruikte pedagogische strategieën

ingezet worden in de dagelijkse begeleiding van kinderen met ASS en kinderen met ADHD die speciale onderwijsondersteuning krijgen. Daarnaast is de relatie tussen de inzet van pedagogische strategieën en vooruitgang op het gebied van gedrag voor beide groepen kinderen onderzocht (Hoofdstuk 3 en Hoofdstuk 4). Uit de resultaten kwam naar voren dat voor kinderen met ASS het structureren van de leeromgeving en het stimuleren van sociaal- en communicatieve vaardigheden gerelateerd zijn aan een afname van respectievelijk sociale problemen en autistisch gedrag. Voor kinderen met ADHD werd gevonden dat het belonen van positief gedrag gerelateerd is aan een afname van ADHD-specifiek gedrag. Een onverwachte bevinding is het relatieve belang van het bieden van emotionele ondersteuning voor zowel kinderen met ASS als kinderen met ADHD, omdat eerdere analyses uitwezen dat deze strategie het minst ingezet wordt in de dagelijkse onderwijspraktijk, en omdat deze strategie de minst voor de hand liggende keuze lijkt te zijn bij de begeleiding van kinderen met overwegend externaliserende problematiek of moeilijkheden met sociale interactie en communicatie. De resultaten van deze studies geven daarentegen aan dat het bieden van emotionele ondersteuning een belangrijk element zou moeten zijn in de begeleiding van kinderen met ASS en ADHD in het speciaal onderwijs.

De invloed van gezinsfunctioneren op probleemgedrag in de klas

Redenerend vanuit het ecologisch model van Bronfenbrenner en de sociale-interactietheorie van Patterson, kan de verwachting uitgesproken worden dat er een mogelijke relatie bestaat tussen problematisch gezinsfunctioneren en het probleemgedrag dat in de klas wordt vertoond door kinderen met gedrags- en/of emotionele problemen. Hoewel deze relatie voor verschillende onderzoekspopulaties in verschillende settingen is onderzocht, is dit zelden in kaart gebracht voor kinderen met gedrags- en/of emotionele problemen die speciale onderwijsondersteuning krijgen. Tot op heden kan daarom de mate waarin het gezinsfunctioneren van invloed is op het probleemgedrag in de klas voor deze specifieke populatie nog niet bepaald worden. Kennis op dit gebied is van belang, omdat de aanwezigheid van een dergelijke relatie de effectiviteit van de geboden begeleiding en onderwijsondersteuning in de klas kan ondermijnen.

In Hoofdstuk 5 wordt een studie beschreven waarin deze relatie werd onderzocht voor internaliserend, externaliserend en totaal probleemgedrag over twee meetmomenten. De onderzoeksresultaten laten zien dat, naast het problematisch gezinsfunctioneren, al deze typen probleemgedrag in hoge mate stabiel zijn gedurende een langere periode. Zelfs in een context waarin aangestuurd wordt op vermindering van dergelijk gedrag. Verder blijkt dat problematische communicatie tussen ouder en kind, een verstoorde relatie tussen opvoeders en een geringe mate van ervaren sociale steun in het gezin leiden tot meer probleemgedrag in de klas. Daarentegen blijkt responsiviteit in de opvoeding toekomstig probleemgedrag in de klas te verminderen. In tegenstelling tot de

verwachting is er een directe relatie gevonden tussen externaliserend probleemgedrag in de klas en toekomstig problematisch gezinsfunctioneren, in plaats van andersom. Dit zou gerelateerd kunnen zijn aan de pervasieve aard van dit probleemgedrag en de negatieve invloed die dergelijk gedrag op de omgeving heeft. De bevindingen uit deze studie hebben raakvlakken met de resultaten die beschreven worden in Hoofdstuk 2 waarin relatieproblemen tussen ouder en kind in belangrijke mate bepalend blijken voor de plaatsing van kinderen met gedrags- en/of emotionele problemen in meer restrictieve settingen waar doorgaans ernstiger gedragsproblemen worden gerapporteerd. Deze resultaten onderstrepen het belang van een integrale aanpak van gedrags- en/of emotionele problemen rondom een kind, waarbij kind en gezin gelijktijdig en op coherente wijze moeten worden ondersteund.

Aanbevelingen voor vervolgonderzoek

Door het quasi-experimentele ontwerp en het beperkte aantal eerdere onderzoeken waartegen de resultaten afgezet kunnen worden, moeten de uitkomsten van het huidige onderzoek als exploratief worden beschouwd en met enige voorzichtigheid worden geïnterpreteerd. In Hoofdstuk 2 en Hoofdstuk 3 bijvoorbeeld, wordt de vooruitgang op verschillende domeinen gedocumenteerd en een vergelijking tussen onderwijssettingen beschreven. Op basis van de beschikbare data kunnen daarentegen geen conclusies worden getrokken over de effectiviteit van de onderwijssettingen of de afwezigheid van verschillen in vooruitgang tussen kinderen in beide onderwijssettingen. Om de resultaten uit het huidige onderzoek te bevestigen en hier meer inzicht in te verschaffen, is toekomstig onderzoek nodig waarin gecontroleerd wordt voor andere variabelen, zoals ervaring van leerkrachten, ouderbetrokkenheid en pedagogisch klimaat. De resultaten uit het huidige onderzoek moeten dan ook gezien worden als aanknopingspunten voor dergelijk onderzoek en bieden daarnaast suggesties voor beleid en praktijk.

Een andere aanbeveling voor toekomstig onderzoek heeft betrekking op de specifieke kenmerken van de kinderen met ASS en ADHD in de onderzoeksgroep. Om een betrouwbare vergelijking te kunnen maken, hebben de kinderen in speciale scholen en reguliere scholen aan het begin van het onderzoek vergelijkbare leer- en gedragsprofielen met de ernst van het probleemgedrag en het cognitieve functioneren op een bepaald niveau. Dit heeft gevolgen voor de generaliseerbaarheid van de bevindingen naar kinderen met ASS en ADHD die andere onderwijsbehoeften en mogelijkheden hebben dan de kinderen in het huidige onderzoek. Om een beter inzicht te krijgen in de vooruitgang van kinderen met ASS en ADHD in verschillende onderwijssettingen zou toekomstig onderzoek daarom kinderen met andere leer- en gedragsprofielen in de onderzoeksgroep op moeten nemen.

Aanbevelingen voor de praktijk

De focus op inclusief onderwijs heeft waarschijnlijk als implicatie dat het aandeel kinderen met beperkingen in een reguliere schoolsetting steeds groter zal worden. De bevindingen van het huidige onderzoek geven aanleiding om te suggereren dat een reguliere setting voor kinderen met gedrags- en/of emotionele problemen in termen van leerprestaties en gedragsverbetering een passende onderwijsomgeving zou kunnen zijn. Hierbij moet wel in het oog worden gehouden dat voor een bepaald deel van de kinderen in deze populatie de gedrags- en/of emotionele problemen dermate ernstig en complex zijn dat onderwijs in een reguliere setting waarschijnlijk nooit een haalbare optie zal zijn. Voor deze kinderen zullen speciale scholen of andere vormen van speciaal onderwijs, waar meer kennis, tijd en middelen zijn om kinderen met dergelijke problematiek te begeleiden, beter aansluiten bij hun onderwijsbehoeften en mogelijkheden. Afgezien van deze kanttekening is het belangrijk om een positieve ontwikkeling van kinderen met gedrags- en/of emotionele problemen optimaal te stimuleren en hun kansen op plaatsing in het regulier onderwijs te vergroten. Daarvoor moet echter wel verhoogde aandacht worden geschonken aan een aantal belangrijke aspecten.

Ten eerste wordt uit het huidige onderzoek duidelijk dat een integrale aanpak van problematiek rondom kinderen met gedrags- en/of emotionele problemen uitermate belangrijk is. Problemen op gezinsniveau, met name op het gebied van communicatie en responsief opvoeden, werken door in de klas en dragen er bovendien toe bij dat deze kinderen een grotere kans hebben om op een speciale school geplaatst te worden. Het is daarom noodzakelijk dat ook de gezinnen van kinderen met gedrags- en/of emotionele problemen begeleiding krijgen bij bestaande problemen in het gezinsfunctioneren, waarbij een goede afstemming plaats moet vinden met de begeleiding die de kinderen op school ontvangen. Daarvoor is een intensieve samenwerking tussen scholen en hulpverlening essentieel. Een dergelijke samenwerking kan daarbij een positieve bijdrage leveren aan de effectiviteit van de speciale onderwijsondersteuning en interventies die op school worden geboden. Een belangrijk onderdeel van deze begeleiding zou daarbij moeten bestaan uit het bevorderen van emotioneel ondersteunende interacties, omdat deze van belang bleken in relatie tot gedragsmatige vooruitgang bij het kind.

Een tweede aspect is de relatie tussen leerprestaties en specifieke interventies die gericht zijn op de bevordering hiervan. Verhoogde aandacht voor deze relatie is niet alleen van belang omdat uit het huidige onderzoek naar voren kwam dat leerprestaties belangrijke voorspellers zijn voor plaatsing op een school voor speciaal onderwijs, maar ook omdat leerachterstanden veelvuldig voorkomen bij kinderen met gedrags- en/of emotionele problemen die gebruik maken van speciale onderwijsondersteuning. Mogelijk zorgt de storende aard van probleemgedrag ervoor dat de nadruk in de begeleiding aan kinderen met gedrags- en/of emotionele problemen eerder komt te liggen op het

verminderen van dergelijk gedrag dan op het verhogen van de leerprestaties. Daarbij veronderstellend dat het leren automatisch verbeterd als de gedragsproblemen en werkhouding aangepakt worden. De bevindingen uit het huidige onderzoek onderstrepen daarentegen duidelijk de noodzaak om in onderwijsinterventieprogramma's in hogere mate het leren centraal te stellen en wetenschappelijk bewezen methoden toe te passen die de cognitieve ontwikkeling van kinderen met gedrags- en/of emotionele problemen daadwerkelijk kunnen bevorderen. In dit verband stelt de Inspectie van het Onderwijs dat een grotere focus op leeropbrengsten en een betere aansluiting tussen onderwijsmethoden, curriculum en individuele onderwijsbehoeften van kinderen in het speciaal onderwijs noodzakelijk is om bestaande leerachterstanden te verkleinen.

Tenslotte hangt het succes van inclusief onderwijs voor kinderen met gedrags- en/of emotionele problemen voor een groot deel samen met de mate waarin leerkrachten in het regulier onderwijs in staat zijn, en zichzelf in staat achten, om kinderen met dergelijke problematiek in hun klas te onderwijzen en ondersteunen. Professionalisering van leerkrachten door het uitbreiden van hun kennis van, en ervaring met, het begeleiden van deze kinderen is daarbij een belangrijk aspect. Dit kan bijvoorbeeld gerealiseerd worden door middel van aanvullende opleidingen, maar ook door leerkrachten vaker te laten participeren in multidisciplinair overleg met onderwijspsychologen, gedragswetenschappers en andere professionals. Hierdoor zullen leerkrachten meer zicht kunnen krijgen op handelswijzen om effectiever om te gaan met kinderen met gedrags- en/of emotionele problemen en zullen zij meer zelfvertrouwen kunnen krijgen om hun onderwijs aan deze kinderen vorm te geven.

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(Acknowledgements)

Dankwoord

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Curriculum Vitae

Curriculum Vitae

Regina Stoutjesdijk was born on August 29th 1982 in Ridderkerk, The Netherlands. After completing her secondary education (VWO) at Farel College in Ridderkerk in 2000, she studied Psychology at Leiden University. She obtained her Masters degree in Developmental Psychology in 2005. After graduation, she started working as a researcher at the Landelijke Commissie Toezicht Indicatiestelling (LCTI) in The Hague, focusing on children with intellectual and/or physical disabilities, and children with emotional and behavioral disorders in special education. In 2008, she started her PhD project at the department of Clinical Child and Adolescent Studies at Leiden University. Her main aim was examining placement and progress of children with emotional and behavioral disorders in special education, and the influence of family functioning on classroom problem behavior. The research was conducted at Stichting Horizon, Rotterdam, an institute providing care and special education for children with emotional and behavioral problems. Besides her PhD project, she was also appointed as a lecturer at the same department. From June 2013, she works as a senior policy advisor at the Education Council of the Netherlands (Onderwijsraad) in The Hague.

List of Publications

List of publications

Stoutjesdijk, R., Scholte, E. M., & Swaab, H. Impact of family functioning on classroom problem behavior of children with emotional and behavioral disorders in special education. *Submitted for publication.*

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